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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR
OCTOBER, 1958

HW--58051-Del.

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Compiled By
OPERATION MANAGERS

November, 21, 1958

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1958

GENERAL SUMMARY

PRODUCTION

Output of plutonium from the separations plants was slightly less than that scheduled; however, year-to-date production exceeds the corresponding commitment.

Production of UO_3 met the commitment, and UO_3 shipments conformed to the established shipping schedule.

Production of buttons and shapes was slightly less than the commitment as shown in the current Official Forecast. Shipments of buttons conformed to the current Forecast, while shape shipments were slightly less than those forecasted.

ENGINEERING

HS column was re-installed in Purex stream October 28, 1958. Sustained operation of Purex at CF 3.2 was demonstrated both before and after HS installation.

The capacity and efficiency of the Purex plutonium ion exchange unit was raised and waste losses were improved five fold when residence time in XA column was increased.

Routine processing of E-metal in Redox plant during October showed characteristic problems in effective system flushing. Fifty-five tons of carefully selected uranium was processed. The second nitric acid flush still yielded 48 units of plutonium and 75 pounds of uranium, 27% and 36%, respectively of the amounts recovered in the first flush. This would be unacceptable in uranium more highly enriched than E-metal.

Use of Mistron 25, a deemulsifier, in the plutonium feed solution, has allowed a 30% feed rate increase to Recuplex solvent extraction columns. No difficulties from using Mistron 25 are apparent after six weeks experience.

A continuous plutonium metal dissolver was operated during October to demonstrate feasibility and explore flowsheet conditions.

Laboratory investigations during October supported the feasibility of recovering neptunium in Redox plant by an acid flowsheet for HA-HS columns and acid deficient flowsheet in 1A column to accumulate neptunium in first cycle. It could then be recovered periodically by working out uranium and plutonium and switching 1A to acid conditions and stripping neptunium in 1B.

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Engineering feasibility of the canyon portion of a batch ion exchange process for the recovery of neptunium from the Purex 3WB stream was established. Designs covering equipment arrangements in the canyon and a geometrically-safe, ion exchange column were completed. Laboratory results to date, however, show extremely low capacity of the proposed ion exchange resin for the neptunium product, limiting the current feasibility of ion exchange flowsheets whether continuous or batch.

Preliminary engineering studies on the final purification and concentration systems for neptunium have been initiated, although a firm chemical flowsheet has not been provided. The sample gallery and the storage gallery are being studied to determine the most suitable place for this equipment.

The Purex 1WW plutonium recovery prototype installation has been completed and is ready for start-up early in November.

Document HW-57857 was prepared and issued during the month describing details upon which a project construction cost estimate may be based for Project CG-811, Additional Pu Fabrication Facilities, 234-5 Building.

All design work was completed during the month on reactivating the pickling hood in the RMA Task III area. Design work was also completed on converting the Task III balance to permit it to measure density of buttons and other shapes.

Preliminary designs covering receiving, storage, and mechanical treatment of power reactor fuel elements at U plant were completed. In addition, similar designs by the Hanford Laboratories covering various Redox alternates were reviewed.

Contract negotiations have been initiated with the University of Washington, to make a seismological analysis of the HAPO area relating to the seismic influence on certain plant facilities.

Fabrication of a prototypal Cesium Recovery System is on schedule in CPD shops. The problem encountered in making a coil of Hastelloy "B" tubing, because of the tendency of this material to work-harden and then crack in heat treatment, has been referred to the manufacturer for recommendations.

GENERAL

At the request of the AEC, a ten-year forecast of CPD production costs through the button operation was prepared and submitted to IPD for consolidation.

The HAMTC has informed the Company of its intent to proceed with arbitration of the Wonacott grievance (Radiation Monitor jurisdiction) at an unnamed early date. They have also notified the Company of withdrawal of the G. M. Brown grievance at arbitration (transfer of a welder to the 200 East shops).

As the result of Redox plant going on a five day week, 33 employees were declared as available for placement. All of these were placed within CPD and HAPO with the exception of nine Separation Utility Operators. Five of the nine operators accepted ROF's, while four voluntarily terminated in order to withdraw their pension money.

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 J. H. Warren
 Manager, Purex Operation P. R. McMurray
 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

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CHEMICAL PROCESSING DEPARTMENT
NUMBER OF EMPLOYEES
OCTOBER 31, 1958

OPERATION	EXEMPT		OTHER		TOTAL	
	9-30-58	10-31-58	9-30-58	10-31-58	9-30-58	10-31-58
GENERAL MANAGER'S GROUP	10	10	1	1	11	11
PRODUCTION	7	7	3	3	10	10
PUREX	51	51	215	217	266	268
REDOX	59	55	255	229	314	284
FINISHED PRODUCTS	58	58	252	263	310	321
POWER AND GENERAL MAINTENANCE	39	39	220	217	259	256
FINANCIAL	21	21	41	42	62	63
FACILITIES ENGINEERING	71	71	23	23	94	94
RESEARCH AND ENGINEERING	62	62	23	25	85	87
EMPLOYEE RELATIONS	30	30	51	51	81	81
TOTAL	408	404	1084	1071	1492	1475

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CHEMICAL PROCESSING DEPARTMENT

PATENT SUMMARY
FOR
MONTH OF OCTOBER, 1958

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

INVENTOR

TITLE

A. W. Hildebrandt, Redox
Operation

Self-Powered Continuous
Sampling Device

J. L. Warner

ACTING GENERAL MANAGER
CHEMICAL PROCESSING DEPARTMENT

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CHEMICAL PROCESSING DEPARTMENT
PRODUCTION OPERATION

OCTOBER, 1958

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Production Statistics

1. Purex Operation

	<u>October</u>	<u>September</u>
Tons uranium processed	470.35	551.00
Average production rate during operation (T/D)	20.6	19.68
Total waste loss (%)		
Uranium	0.08	0.08
Plutonium	0.26	0.33
Average cooling time (days)	106	103
Minimum cooling time (days)	92	89
On-line efficiency (%)	73.4	93.5

2. Redox Operation

	<u>October</u>	<u>September</u>
Tons uranium processed	55.6	149.99
Average production rate during operation (T/D)	5.8	9.3
Total waste loss (%)		
Uranium	0.59	0.25
Plutonium	0.74	0.51
Average cooling time (days)	114	109
E-Metal	202	
Minimum cooling time (days)	112	94
E-Metal	195	
On-line efficiency (%)	30.5	54.0

3. 234-5 Operation

	<u>October</u>	<u>September</u>
Batches to Task I	230	310
Runs completed thru Task II	200	221
Charges completed thru Task III	94	54

Waste disposal (units)	531.04	808.05
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4. UO₃ Operations

	<u>October</u>	<u>September</u>	<u>To Date</u>
UO ₃ loaded (tons)	562.6	582.9	
UO ₃ approved for shipment (tons)	559.62	607.8	29,830.52
UO ₃ shipped (tons)	509.39	504.49	29,457.27
UNH backlog (tons)	188	269	

5. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped (gpm)	9,387	4,054
Filtered water pumped (gpm)	878	933
Maximum steam generated (lbs/hr)	241,000	110,000
Average steam generated (lbs/hr)	162,480	78,240
Total steam generated (M lbs)	120,885	58,210
Coal consumed, est. (tons)	8,402	4,119

6. Waste Storage

	<u>Equivalent Tons U</u>	
	<u>October</u>	<u>September</u>
Salt waste reserve storage capacity-Redox	2,594	2,650
Salt waste reserve storage capacity-Purex	35,182	35,652
Coating waste reserve storage capacity-Redox	31,107	31,163
Coating waste reserve storage capacity-Purex	48,464	48,934

B. Production Planning and Scheduling

The Quarterly Production Forecast, CLVI-527, covering the period through the first quarter of fiscal year 1961 was prepared and issued during the month. Detailed data and assumptions upon which the forecast was based are shown in document CLVI-521.

One significant change in IPD is lowering of the goal exposure for I & E slugs in the K reactors during the early part of the forecast period due to recent experience of greater rupture rate in these slugs. After January, 1960, the exposure will increase to the levels formerly scheduled.

A ten year forecast covering the period FY 1959 through FY 1968 was prepared near the end of the month at the request of HOO-AEC. The first two years of this forecast are the same as the Quarterly Production Forecast. After FY 1960, the forecast shows only a relatively small production increase from the present reactors - the assumption

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being made that if one or more are shut down they will be replaced with reactors of like capacity. The significant items of the latter years of the forecast are the addition of discharges from NPR-1 in the last quarter of FY 1963 and NPR-2 nine months later.

Several meetings were held during the month with the representative of HOO-AEC to work out shipping schedules for UO_3 which would be compatible with the production schedules.

Initial meetings of a task force appointed to study the feasibility of recycling plutonium waste from the 234-5 Building to Redox plant were held, during which the group was organized and plans formulated.

A meeting was held with the concerned personnel to establish procedures and control measures for the shipment and handling of E-metal.

During the past three months the volume liquid to the Purex tank farm condensate and cooling water crib has almost doubled in rate which is equivalent to a crib depletion rate of about 5% per month. Assuming no change in waste characteristics, and based on the entire soil column beneath the crib being utilized, the present rate of addition, presumably caused by increased water additions to boiling tanks, could shorten the estimated crib life by about twelve months, from 2-1-61 to 2-1-60.

Drilling of the 100 foot monitoring well immediately northwest of Tank 113-SX was completed 10-7-58 and subsequent monitoring of the soil showed negative results insofar as a leak in the tank is concerned. Further investigation of the tank condition is under way.

C. Finished Products and Customer Liaison

The Fission Products Market Survey progressed according to schedule; however, the completion date of the study was changed to about January 1, 1959. The change in completion date was made to permit the completion of the study to coincide with the completion of a gamma irradiation study being performed by Arthur D. Little, Inc. for Emerson - AEC/OID. This action will permit the issuance of a joint report covering information common to both studies.

No information is available as yet from the DOD survey of the military or classified needs for irradiation sources. This information is ex-

pected to be made available to the AEC by November 1, 1958. Several areas of a military nature hold promise for early development of a market for fission products in, possibly, the next five years.

E. Reports and Documents

1. Prepared and Issued

- HW-57657 RD Redox Plant Production Schedule, October, 1958
D. McDonald
- HW-57658 RD Purex Plant Production Schedule, October, 1958
D. McDonald
- HW-57659 RD UO₃ Plant Production Schedule, October, 1958
D. McDonald
- HW-57660 RD 234-5 Plant Production Schedule, October, 1958
D. McDonald
- HW-57710 Essential Materials Consumption-Purex - Chemical
Processing Department for September, 1958,
M. A. Thress
- HW-57711 Chemical Processing Department - Waste Status Summary
for September 30, 1958, R. E. Roberts
- HW-57715 Palm Recovery, J. H. Warren
- HW-57798 Essential Material Area Report to Cost and Purchasing-
Production Operation - Chemical Processing Department
for September, 1958, M. A. Thress
- HW-58033 RD Third and Fourth Quarters FY 1959 Forecast of Nuclear
Materials Requirements - Chemical Processing Depart-
ment, October 31, 1958, H. F. Tew
- CLVI-520 Official Quarterly Forecast - Chemical Processing De-
partment, October 1958 thru September 1960,
D. McDonald

2. Prepared for Signature and Issuance

- HW-57647 Production, September, 1958, A. B. Greninger
- CLVI-527 HAP0 Production Forecast, A. B. Greninger

III. ORGANIZATION AND PERSONNEL

A. Safety

There were no plant injuries incurred by Production Operation personnel during October, 1958.

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B. Security

There were no security violations in the Production Operation during the month.

C. Visit

L. M. Meeker spent October 21 and 22, 1958 in Boston, Massachusetts, for discussions with A. D. Little, Inc., on the fission products market survey.

R. E. Tomlinson

Acting Manager
Production Operation

CHEMICAL PROCESSING DEPARTMENT
PUREX OPERATION

October, 1958

I. RESPONSIBILITY

There were no changes in the responsibilities of the Purex Operation during the month.

II. ACHIEVEMENT

A. Processing Experience

1. Production Statistics

a) Production - Percent of Monthly Commitment

Uranium	94.1 Percent
Plutonium	89.2 Percent

b) Production Rates

9-27-58 at 2115 to 10-5-58 at 1615	1.92 CF
10-5-58 at 1615 to 10-13-58 at 2230	Scheduled Outage
10-13-58 at 2230 to 10-16-58 at 1700	2.4 CF
10-16-58 at 1700 to 10-17-58 at 1400	2.64 CF
10-17-58 at 1400 to 10-23-58 at 1500	3.0 CF
10-23-58 at 1500 to 10-28-58 at 0845	3.2 CF
10-28-58 at 0845 to 10-28-58 at 1630	Partial outage for installation of HS column
10-28-58 at 1630 to 11-4-58 at 1630	3.2 CF

c) Operating Continuity

Plutonium	73.4 Percent
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d) Waste Losses

Uranium	0.08 Percent
Plutonium	0.26 Percent

e) Product Retreated in Silica Gel 325 Tons

2. Normal Processing

The month's activities were highlighted by the successful demonstration of the 3.2 capacity factor with adequate decontamination factor for plutonium and uranium, both with and without the HS column in service. The HS column was installed midway through the 3.2 CF demonstration.

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Following the startup on October 13, the HAW losses were higher than normal due to a low column pulse rate. The losses were recovered by combining with the 3WB stream; however, a minor gamma burst followed and both products went out of specification temporarily. Two high plutonium batches were blended off with acceptable product and the uranium met specifications after silica gel treatment.

In trying to obtain maximum df on the HA column while operating at a 3.2 CF without the HS column, a period of high HAW losses occurred due to over-saturation. Coincidental was the loss of Palms which had been building up in the 3WB system. The material was isolated and held for future rework.

A weld leak on the N-6 plutonium concentrator was temporarily repaired with makeshift materials. The delay allowed enough time to route the dilute XCP product stream back to the L-4 concentrator and prevented an outage. Repairs were made and the operation was returned to normal without incident.

The decontamination of the HS column was completed during the shutdown. It was subsequently removed to M cell, repaired, and returned to service on October 28. An additional df was achieved with the installation of the column which permits increased processing flexibility.

Uranium gamma ratio on the final product was slightly above the 2.0 limit during most of the month and resulted in sixty percent of the product requiring silica gel treatment.

Dissolver operations were normal after building startup on October 14. Iodine emission was under control during most of the period. Several preventive measures were required and taken but the results of each are difficult to appraise.

The changes were as follows: regenerated the F cell reactor; maintained better control of solution temperatures on the vessel vent system and mercuric nitrate additions to the metal feed batches.

Self concentration in tanks 241-A-101, 102, and 103 continued at a rate of 4.7, 14.3, and 1.5 gallons per minute, respectively.

Radiation profile readings, sludge levels, and profile temperatures under varying degrees of dilution in tanks 101-A, 102-A, and 103-A were completed.

Purex coating wastes were transferred from 241-C-105 tank to 241-BY-107 and 110 tanks without incident.

3. Special Processing

During the scheduled outage, the following process movements were completed:

- a) Flush of the K-2 column with hot sixty percent nitric acid

followed by a five percent sodium carbonate flush.

- b) Flush of the G-1 tank with five percent oxalic acid.
- c) Completion of the HS column flush.
- d) Decontamination of the failed F6 tube bundle and replacement of same.
- e) Stripping of 2A-2B and 2D-2E systems to determine normal inventory holdup (2100 units and 1180 lbs., respectively).

Approximately 370 units of plutonium and 780 pounds of uranium were successfully recovered from a batch of waste which had been refluxing in F8 for over 30 days. This was an accumulation of carbonate waste from R cell, sump collections, and column flushes. A previous attempt to rework this material in September after twelve days of refluxing resulted in a gamma burst.

During the shutdown a new batch of reworkable waste from R cell and column flushes was concentrated in F11 and moved to F8 for refluxing and future recovery.

One batch of plutonium product was reworked due to high gamma activity and two batches were blended to produce an acceptable product. Two batches of uranium were recycled to accommodate the reworked product.

4. Variance

The month's production was limited to 94 percent of commitment due to an extended outage, the rework of uranium, and a short outage for the HS column installation. The extended outage was caused by a failed F6 tube bundle and difficulties in replacing the F2 silver reactor heater.

B. Radiation Experience

The total monthly iodine 131 emission was 17.7 curies. The maximum emission in a seven-day period was 5.7 curies for the week ending October 29. The average 24-hour emission rate during the month was 0.57 curies.

Seventeen Radiation Occurrences were incurred during the month. Six and a half were failure to comply with procedures; four and a half were loss of control of contamination within radiation zones and four were skin contamination cases. There was one resulting from loss of control of contamination from a radiation zone and one from an unplanned dose rate exceeding 6 mrem/hr. outside a radiation zone. Although the total number of Radiation Occurrences rose sharply during October, none had potentially serious radiation implications.

A PR can was accidentally upset on the PR loading dock. An estimated 100 ml of concentrated product solution leaked out of the can but was

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contained by the PR can jacket. There was no contamination spread outside of the jacket.

The average dose rate on the HS column following decontamination was 100 mr/hr. at 18 inches, which points out the efficiency of the decontamination methods employed.

After cleaning, the average dose rates on the canyon deck from A through F cells were less than 50 mrad/hr. with the exception of a few isolated small spots.

Repair of the U-2-2 pump continued from last month. The maximum contamination level found on the pump was 6.5 rads/hr. The repair work was accomplished at an average dose rate of 150 mrads/hr.

On several occasions, contamination was spread in the Analytical Laboratory. Floors and other horizontal surfaces were contaminated to 40,000 d/m plutonium. Contaminated shoe covers were often the first indication of a spread. Investigation disclosed that the supply air to the laboratory was causing turbulence which helped to spread loose contamination. The air flow to the room was reduced, and air flows to various hoods were increased. Since these adjustments there has been no further spread of contamination.

C. Mechanical Experience

Modification of the drain outlet of the A cell ammonia scrubber was successfully completed following decontamination and utilization of the lead shielding techniques. Modifications consisted of removing the vertical nozzle with built-in trap seal and installing a horizontal nozzle with direct outlet from the scrubber. Preliminary operational tests revealed that these changes were necessary to eliminate air traps and permit liquid to drain freely to the catch tank.

Repairs to the railroad tunnel car puller, including the replacement of four carriage rollers and the reinforcement of the triangular hook assembly, were completed during the month. Intermittent overloading of this equipment was caused by a defective axle on one of the cask cars. This car is now undergoing repairs.

The F6 RH tube bundle was found to be leaking and was replaced.

The bottom loop on the N6 plutonium concentrator was replaced on October 28 after a leak developed at a weld on the low pressure specific gravity dip tube.

The F2 steam heater was replaced with a new unit because of a steam leak in the north head. A rebuilt unit was first installed; however, it also leaked and was replaced. The outlet vapor jumper on the heater was replaced due to a gasket failure.

The installation of the IWW resin column and fourteen associated jumpers was completed.

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The drive belts on the #3 exhaust fan at 291-A caught fire from friction. No damage was sustained other than to the twelve drive belts which were burned.

The D5 agitator was replaced on October 30 after excessive noise and fluctuating amperage was detected. A repaired agitator from the Hot Shop was used as a replacement.

The leaking HS column was decontaminated to the point where it could be examined and repaired. Stress cracks were found in the metal plate adjacent to the interface control chambers. The cracks were ground out, welded, and reinforced, after which the column was hydrostatically tested and returned to service.

D. Analytical Experience

The new 95 percent confidence level limit on the isotope correction factor, instituted last month, could not be met due to a shift of MWD on the metal received in process. This shift and any comparable shifts in the future would indicate the need for a more frequent review of the ICF limit than the present once-per-month schedule.

A new alpha energy analysis head for the 256 Channel Pulse Height Analyzer was not received as scheduled. Linearity checks on the 256 have been made and gamma calibrations are progressing.

E. Improvement Performance

1. Process Tests and Revisions

Tests were continued to improve Palm recovery technology. Nitrite was added to the HAO stream in varying quantities in an effort to adjust the valence of the Palm to the six valence state and thus prevent loss via the HAW. Results were encouraging.

The HAO flow was varied over a wide range also without materially improving the Palm recovery or HA column decontamination. It was determined that over-saturation of the HA resulted in loss of Palm via the HAW.

2. Equipment Changes

The first section of the 216-A-24 crib has received a volume of the 241-A tank farm condensate and condenser cooling water that is approximately equal to the predicted SR⁹⁰ breakthrough volume. Immediate action was taken to have a bypass line installed around the first section.

F. Inventions and Discoveries

No inventions or discoveries were reported by Purex personnel during October, 1958.

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G. Events Influencing Cost

Maintenance costs were unusually high for the month due to the replacement of one concentrator tube bundle, one expensive vapor jumper, and three thermohm jumpers.

Approximately 40 cubic feet of Berl saddles were coated during the month. This represents an out-of-pocket saving of \$7500 to CPD under the cost of having the work done by an outside vendor.

It was necessary to increase the work force in the Analytical Laboratory by four laboratory assistants on a permanent basis, plus three other laboratory assistants on loan from Redox, to handle the increased analytical work resulting from the Palm program and the capacity factor test. One analytical chemist was added to support the Palm program.

III. ORGANIZATION AND PERSONNEL

A. Safety

There were no disabling injuries or serious accidents during the month. Three medical treatment injuries were reported.

B. Security

There were no security violations in October.

C. Personnel Activities

There were no contacts with the Servicing Department components of the Company.

J. R. Cartmell visited Savannah River and Oak Ridge National Laboratory to take part in discussions on the separations processes.

Mr. Morin from the Washington AEC Equipment Procurement Office toured the Purex Plant on October 29.

L. M. Vik, Instrument Specialist, attended a two-day training session at the Radiation Counter Laboratory in Skokie, Illinois. The training program was sponsored by RCL to provide customers with special training techniques in the maintenance and repair of the 256 Channel Analyzer.

J. D. Smolen
Acting Manager
Purex Operation

SG Smolen:EAF:gt

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CHEMICAL PROCESSING DEPARTMENT
REDOX OPERATION

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OCTOBER, 1958

I. RESPONSIBILITY

There were no changes in the scope of responsibility of the Redox Operation this month.

II. ACHIEVEMENT

A. Processing Operation

1. Production Rates and Operating Continuity

Processing operations were scheduled and conducted on the five-day week schedule which was inaugurated in the Redox Operation on 10-6-58. Processing was shutdown for eight hours on 10-7-58 because of a faulty D-14 steam trap, and nine hours on 10-15-58 when head end feed solution was delayed by prolonged dissolution time for special push metal dissolver heels. Except for short periods before and after shutdowns the production rate was maintained at 100% of nominal.

The monthly production commitment was achieved while operating 24% of the total hours in the month. The mechanical efficiency for the period was 91%.

Product waste losses for the month, which were slightly higher than normal due to the handling of large amounts of flush material, averaged 0.59% for uranium and 0.74% for plutonium. All uranium and plutonium produced during the month was within shipping specifications, however, three batches of UNH with excessive gamma activity required ozonation and/or silica gel treatment to meet shipping specifications. Due to high gamma ratios, two of the E-3 plutonium batches were reprocessed through the second and third plutonium cycles before sending them to the concentration building.

Iodine-131 emission to the 291-S stack was under good control averaging only 0.16 curies per day.

Two complete 100 area pushes were processed during the month as an accountability test on material balances between departments and across the plant. Processing of this special material was started on 10-6-58 and continued until 10-16-58. To assure accurate test data on these special charges, extensive cleanout flushes were conducted before and after the processing. Also, information will result that will provide an evaluation of the effectiveness of flushing for metal segregation purposes.

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About 30 tons of composite UNH waste from the 224-U Plant was received for reworking. Processing of this material was started on 10-28-58 at nominal rates, but due to foaming difficulties in the concentrator, the rates were cut to 50% of nominal. The UNH produced from this material to date has been out of specifications from high plutonium content, however, flowsheet changes are being made in an attempt to correct this condition.

Two batches of E-metal were received and charged into the A-2 and C-2 dissolvers without incident. E-metal solution inventory will be brought up to a maximum prior to the start of processing during the latter part of November.

2. Equipment Experience

Replacement of the B-2 dissolver, because of a coil leak, with a repaired unit from the H-2 position was started. However, visual inspection of the pot interior, after the pot was removed, revealed a sizeable heel remaining in the dissolver. The pot was reinstalled and repeated efforts made to dissolve the heel, none of which were successful. The tower was again removed and sample slugs taken from the pot for study on dissolution methods by laboratory personnel.

B. Maintenance Operation

A neutron counter was installed in the 233-S Building, L-16 tank. Also, the L-4 to L-5 transfer line was relocated to facilitate launching of a plastic man from this location.

Canyon equipment installations consisted of a new F-4 vessel and nine jumpers, three of which were new and the remaining six were replacement jumpers. Crane work consisted of replacement of the right and left hand impact wrenches and the ten ton hoist cable.

Improved performance in routine inspections, particularly in instrument maintenance, resulted in 285 inspections and lubrications being accomplished during the month.

A continuous sampler for determining the amount of contamination contained in the process cooling water from the Redox Plant was designed, fabricated and installed in the 216-5 crib weir. A "Report of Invention" has been submitted on a new application of the Ram Jet as used in this sampler.

C. Waste Handling and Decontamination Operation

1. Waste Handling

Redox Coating Waste Received (S Farm)	9,163 Gallons
Redox Salt Waste Received (SX Farm)	67,550 "
Total Gallons Boil-Off Salt Waste	159,634 "
Waste Received at TX (From 221-U)	30,250 "

Daily electrode checking of the 113-SX tank indicated that the tank bottom remained static during the month. The leak detection program started late in September is progressing satisfactorily. The test well drilled northwest of the 113-SX tank to determine the extent of

ground contamination was completed without finding a trace of contamination. A caisson, twelve feet in diameter will be sunk at the same site as the test well with laterals radiating out under the tank from the bottom of the caisson.

Of the two available lines for pumping non-boiling waste from the 241-SX to the 241-TX tank farm, one was found to be plugged, the other to have a leak. This situation made necessary an alternate program consisting of pumping the waste to the 101, 102 and 103 tanks in the 241-U farm. The pump out of the 111-SX tank will make this tank available for raw salt waste from the 202-S Building.

2. Equipment Decontamination and Repair

a. Regulated Steam Pit

A total of 17 vehicles, one piece of heavy equipment, and several miscellaneous items were decontaminated during the month. A total of 122 manhours were charged to this operation.

b. Railroad Equipment

A total of 190 manhours was charged to this operation. Work included decontamination and operational coverage for repairs of well cars 36, 37, 40, 45; flat car 19031; coal hoppers 4608, 39; locomotives 20, 22, 30, 32 and miscellaneous items.

c. 221-U Canyon

Repairs to the coil of the Redox A-2 dissolver were completed for approximate savings of \$21,300. Three Redox steam trap jumpers were decontaminated, repaired and returned for an estimated savings of \$4196. Redox equipment decontaminated for repair consisted of one 10-ton hook, two charging yokes, one E-1 process pump, one F-4 pot, one waste jumper and three 804 pumps. Repairs were completed on one Purex P-J-3 pump for an estimated saving of \$2000. A Finished Products X-30-2 pump was returned to the 224-U Building. Pump parts were cleaned and returned to 105-KE for a manhour saving of about 170 hours. Forty thousand eighty four dummy slugs, used in the 100 Area reactors, were decontaminated and returned to the customer.

D. Analytical Control

Laboratory efforts were applied chiefly to support of the Redox Special Accountability test run conducted during the month. One hundred percent referee and standard analyses on a minimum of duplicate samples from all accountability sampling points required maximum effort and planning in the attempt to stay abreast of the sample load and insure sufficient sampling equipment.

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E. Radiation Monitoring Operation

Four radiation occurrences were reported during the month. Two of the occurrences involved low level contamination found inside non-regulated vehicles. The third occurrence involved self-monitoring in excess of 100 mr/hour. The fourth occurrence resulted when a laboratory assistant dropped a dilution sample of dissolver feed while making a transfer from a lead barricade onto a dolly. This resulted in floor area contamination up to 1000 mrad/hour smearable contamination. Decontamination was prompt and effective. No personnel contamination was involved.

Personnel dose rates to accomplish canyon crane maintenance remained unchanged from September. Smearable contamination has been noticeably higher, with smears of 2 rads/hour taken from the horizontal surfaces. A dose rate of 5 rads/hour was detected while lubing the crane wheels at the north end of the west catwalk.

Dose rates to greater than 22 rads/hour were observed while removing waste from a laboratory cubicle to the dry well. Exposure to personnel was minimized by the use of six foot tongs.

Exposure rates of 7 rads/hour, including 500 mr/hour gamma, were detected during installation of a continuous sampler in the 216-S-5 crib well box.

F. Improvement Experience

1. Process Tests and Revisions

Information relating to this item is covered in the Research and Engineering portion of the Department report.

2. Inventions and Discoveries

<u>Inventor</u>	<u>Subject</u>	<u>Report of Invention</u>
A. W. Hildebrandt	Self powered continuous sampling device	10-17-58

G. Events Influencing Costs

The midyear review of the budget for "Equipment Not Included in Construction Projects" indicates that a reduction of nearly \$70,000 can be effected because of improved design in rotating equipment, and accomplishments in decontamination and repair of failed equipment.

Spare parts reductions during October amounted to \$2439. The total reduction for the year now stands at \$23,500.

H. Plant Development and Expansion

1. Preparatory Engineering

Plant Modifications for Processing Non-Production Reactor Fuels

A project proposal draft is being circulated for comments. Plans include a receiving station and storage facilities at U-Plant and moving of the Waste Handling and Decontamination Operation to T-Plant. Funds to be requested for these two items is to be \$1,700,000, the first of total project fund requests expected to amount to \$8,000,000.

Redox Inert Gas System

An appropriation request for \$5000 is being circulated for approval to purchase a regenerative silica gel tower. Two small activated aluminum filters are ready for welding into the sample gallery inert gas loop when this system can be isolated. Plans are also formulated for a flush, checking of screens, and a thorough inspection of the piping for corrosion.

2. Design and Construction Liaison

CG-772 - "E" Metal Dissolvers - Redox

As previously reported, the AEC has deferred action on the request for construction funds until criticality tests now underway at Oak Ridge are completed.

CG-783 - Additional Fire Protection - 222-S Building

Bids were opened on 9-29-58, with a low bid of \$14,379 from the National Automatic Sprinkler Company. The contractor is presently drawing up his design for submission to the AEC.

CGC-812 - Equipment Decontamination Building - 2706-W

A revision to the project proposal is being routed for approval. The revision calls for changing the location of the building to the 211-T area because of the contemplated move of the Waste Handling and Decontamination Operation to T-Plant.

MA-10 - 113-SX Waste Tank Leak Detection

Contractors bids will be opened November 4, 1958. Materials consisting of caisson sections, stainless steel pipe and a radiation detection instrument are on site.

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

The change out of the Wilfley pump to the project procured pump was completed this month. Minor clean-up items will complete this facility.

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CG-686 - In-Line Monitoring Instruments, Redox and Purex

The gamma monitor installation for the condensate header has been started. This instrumentation may be of little use until decay rate and self-washing reduce the radiation background.

I. Reports Issued

No secret reports were issued by Redox Operation personnel during the month of October, 1958.

III. ORGANIZATION AND PERSONNEL

A. Safety

There were no disabling injuries, serious accidents or incidents in the Redox Operation during October, 1958. Eight medical treatment injuries were reported during the month.

Two fire alarms were experienced during the month at the Redox Analytical Laboratory. One alarm resulted from a burned out light ballast which filled the room with smoke, the other was a false alarm. The false alarm could not be traced to equipment failure within the building, and is believed to have been set off by heavy equipment vibration of the master alarm box on the pole near the front of the 222-S Building.

B. Security

There were no security violations in the Redox Operation during the month of October, 1958.

C. Personnel Activities

M. L. Short, Manager, Redox Waste Handling and Decontamination Operation, presented a talk at the Atomic Energy Commission's Annual Welding Committee meeting held in Richland on 10-15-58 and also to a combined management and technical group of the Eurochemic Company on 11-3-58. His subject included a brief history of the equipment decontamination operation at HAPO, a resume of accomplishments to date, and the potential market for decontamination services in the field of atomic energy.

J. D. Duncan, Redox Contact Engineer, visited with representatives of the Pennsalt Chemicals and Industrial Air Products Company in Portland, Oregon on 10-2-58 and 10-3-58. Information gained from their methods of compressing gases will be utilized in correcting deficiencies in the Redox inert gas system.

C. B. Foster, Special Assignment, Redox Operation, visited the Oak Ridge National Laboratory on 10-27-58 and the duPont Savannah River Works on 10-28-58 and 10-29-58. Purpose of the trip was to review technique and equipment used for handling and processing irradiated fuel elements.

E. C. Wood, Shift Analyst, transferred to the Power and General Maintenance Operation effective 10-6-58.

W. S. Lee, Maintenance Foreman, was transferred to the Fuels Preparation Department effective 10-1-58.

Mr. L. E. Clover, Consultant, Plant Engineering and Maintenance, and Mr. Homer P. Ransom, Senior Engineer, Methods and Time Standards, of the Manufacturing Services Department visited the Redox Operation to discuss maintenance aspects of the plant.

As a result of working without a lost time injury for over 1,000,000 manhours, the Redox Operation became a member of the CPD Million Man-hour Club on September 25, 1958.

Chas. B. Swarth
Manager
Redox Operation

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CHEMICAL PROCESSING DEPARTMENT
FINISHED PRODUCTS OPERATION
MONTHLY REPORT

OCTOBER 1958

I RESPONSIBILITY

There were no changes during the month in the responsibilities assigned to the Finished Products Operation.

II ACHIEVEMENT

A. Processing Operations

The October delivery requirements for unfabricated plutonium were met. Production, however, was 11% under schedule. The Recuplex operation exceeded its schedule by 7% for the month.

Production through the plutonium reduction system was seriously affected by feed shortages at mid-month, and by equipment troubles coupled with a scheduled outage for Minor Construction work during the latter part of the month. Operating difficulties were the result of minor troubles with off-gas filters, drum filter cloth failure, plugged pumps, and a failure of the vacuum system. Process difficulties involved poor "strikes" in 9A reactor, and out-of-specification material caused blending problems. Utilization of increased batch sizes in PR cans (increased by 67% over previous loadings) has been of benefit to both the Z Plant and the primary plants as it reduces handling and the personnel exposure associated with handling.

The operation of the Recuplex facility was generally satisfactory during October with the schedule being exceeded for the first time in several months. The Recuplex dissolver processed 55 slag and crucible runs with an average waste loss of 0.38%. The solvent extraction columns operated at 72% efficiency at an average of 1570 liters/day, or at an instantaneous rate of 2180 liters/day. Column waste losses were 0.52%. The backlog at month end stands at 160.2 kg of recoverable material.

The new prototype continuous dissolver has performed well but has required an undue amount of maintenance. The supernate recycle concentration equipment has been calibrated and run in after considerable difficulty. Improper installation of this equipment by Minor Construction made it impossible to calibrate until extensive corrections were made. Other inadequacies were revealed by the water boil-down test. It is anticipated that this equipment will be placed in "hot" service during the first part of November.

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B. Fabrication Operations

C. Uranium Reduction Operation

All production schedules were met. There were 563,695 pounds of 100% nitric acid recovered.

Initiated this month was the recovery of UO_3 from old filter bags which have been collected over the past three years. This effort has been discontinued temporarily at month end to install a fresh air system and to make minor modifications to the tumbler being employed. The nitric acid handling system at this plant was completed (Project CG-722).

D. Maintenance Operation

Equipment experience in the Z Plant was only fair during the month, with principal difficulties being experienced in the continuous Task I and II equipment and in Task V, machining. In the Task I and II equipment the main source of trouble was the "Porolloy" fluorinator off-gas filter. In Task V, severe difficulties were experienced with the air compressors supplied with the 200 BR machining hood. Compressors similar to those used in the 200 C hood have been ordered as permanent replacements. Also, the Recuplex facility needed extensive repairs during the month, and the new continuous plutonium dissolver required extensive maintenance and modification work.

Equipment performance at U Plant was reasonably good with only two minor failures of the continuous calciners. Both of the failures involved unloading weirs and required removal of one section of the calciner cover. Also, considerable difficulties were experienced with the UNH concentrator and feed systems

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D. Maintenance Operation (Cont'd)

as well as the acid recovery system. The powder and waste handling systems operated without requiring any unusual repairs. Among the improvement items at the U Plant is the extensive repair program being conducted by the General Electric Company shops to tighten commutator bars on all six ACA calciner drive motors.

E. Control Operation

A total of 8735 determinations were performed on 1629 samples received during the month.

F. Radiation Monitoring

Fourteen radiation occurrences were documented and fourteen cases of skin contamination were reported during the month. Average stack emissions were 8.1 micro curies/day for the month (24th to the 24th). During the last week, however, emission rates have been significantly higher, but corrective measures were started immediately.

A highly contaminated injury was experienced by an operator in Metal Finishing. The wound was cleaned to the extent that no restrictions on work are indicated.

Radiation experience in the 224-U Plant was particularly good during the month. No radiation occurrences were documented in that operation.

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

No inventions or discoveries of a patentable nature were reported during the month.

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H. Events Influencing Cost

Nothing significant to report.

I. Plant Development and Expansion

1. Projects: Study, Scoping or Approval Phase

A project proposal is being prepared requesting design and construction funds for replacement of the 216 WR cribs at the Uranium Reduction Plant. The project proposal for providing waste handling equipment at the Uranium Reduction Plant is being circulated for approval within the General Electric Company.

Design funds have been obtained and the project scope has been completed for waste incineration and leaching in the 234-5 Building. Cost estimates are being prepared for inclusion in the proposal for construction funds.

Commission approvals have been obtained for the expenditure of design funds for additional fabrication equipment, 234-5 Building. A proposal requesting construction funds in the amount of \$1,600,000 has been submitted to the Commission for approval.

Construction funds have been requested to provide additional Fire Protection, 234-5 Building.

2. Projects: Construction Phase

A total of eight projects are in the construction phase for the Finished Products Operation. They are: CG-745, Fabrication Equipment; CG-734, RMC Button Line; CG-722, UO₃ Nitric Acid; CG-723, Conversion of Recuplex; CG-756, Fire-proof Filter Replacement; CGC-800, Reduction of Radiation Exposure, RMA Line; CA-798, Cribs and Test Wells 234-5; and CG-767, Rev. 2, UO₃ Improvements.

Project CG-723 will require a new proposal requesting additional funds to complete the scope of work.

3. Projects: Completed

No capital expenditure projects were completed during the period.

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III ORGANIZATION & PERSONNEL

A. Organization Changes

There were no organization changes during the month.

B. Safety Experience

There were no Disabling Injuries experienced during the month. One Near-Serious accident occurred in which a Utility Operator suffered serious abrasions and contusions to his leg when it was caught between two PR cans while these were being loaded on a truck at the Purex plant. Seven Medical Treatment Injuries were experienced this month as compared to five in September. The frequency rate rose from 1.09 to 1.19.

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

There were no security violations experienced during the month.

E. Personnel Activities

A new radiation training and discussion program has been started for the Finished Products Operation. Twenty-five employees attended the sessions held in October.

Seven employees are attending PBM-1 and two are in the current "Understanding People" course.

Fifty-three exempt personnel and 51 wives attended an employee morale dinner during the month. Favorable comment and appreciation expressed regarding this affair indicate that this type of mixed meeting is a significant factor in the improved morale and loyalty of the Finished Products Operation exempt roll personnel.

W. N. Mobley, Manager
Finished Products Operation

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CHEMICAL PROCESSING DEPARTMENT
POWER AND GENERAL MAINTENANCE OPERATION

OCTOBER 1958

I. RESPONSIBILITY

Responsibilities of the Power and General Maintenance Operation remained unchanged during the period covered by this report.

II. ACHIEVEMENT

A. Operating Continuity

Steam, water, and emergency electrical services were made available to the prime production facilities in sufficient quantities to sustain continuity of operations without interruption for the entire month.

B. Inspection, Maintenance, and Replacement

Fabrication of the prototypal dual-pass Silver Reactor for Purex is 60% complete. The vessel proper has been assembled and charged with treated ceramic saddles. It is anticipated that the remaining exterior work will be accomplished as planned and result in the completion of the entire unit by December 1 as scheduled.

Repair of the Purex H₃ column, which developed a leak several weeks ago, was completed under direction of Facilities Engineering Operation personnel. This vendor-fabricated unit had been modified extensively in the 272-W Shop to adapt it for use in the two-cycle conversion project. Visual and photographic inspection revealed two cracks several inches long, which appeared to be the result of stress.

Fabrication and final assembly of the Degreasing and Briquetting Hood for 234-5 was completed as scheduled on October 9. The hood was installed in place of the Delta Hood which was removed for burial.

A surge pot was fabricated and installed in Hood 161, the continuous dissolver at Recuplex. It is designed to dissipate, and vent to the exhaust system, the energy of any sudden and violent reaction such as caused damage at this hood a few weeks ago.

Modification of three condensers for Project CG-719, Purex Vapor Wastes, is progressing. One unit is 65% complete, but further progress awaits receipt of vendor-supplied items promised for November 15. The second and third units are 50% and 10% complete, respectively. All units will be complete two to three weeks after receipt of purchased items.

Fabrication of a prototypal Cesium Recovery system for Hanford Laboratories Operation is on schedule. Work on two Hastelloy "B" vessels and on 304-L stainless steel is 65% complete and assembly of two stainless steel tanks 30% complete. The problem encountered in making a coil of Hastelloy "B" tubing, because of the tendency of this material

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to work-harden and then crack in heat treatment, has been referred to the manufacturer for recommendations.

The U233 Fuel Element Program is running behind original schedule at 231-Z, and elements are not expected to arrive at the Machine Shop before late November. Work done, however, in support of this program, included machining of stamping dies, extrusion press parts, and a graphite capsule.

Twenty-three replacement jumpers were fabricated -- 11 for 202-A, 11 for 202-S and 1 for 241-BX.

Two Purex concentrator tube bundles, H-4 and F-6, and a Redox F-4 vessel, were cleaned, tested and shipped to the respective plants to replace failed units.

Four process pumps and two agitators were assembled, tested, and placed in standby status.

Two burials were completed for Redox. One involved the disposal of contaminated and defective tube bundles which were inserted in a specially designed whaler box. Although the radiation level was very high, this burial was accomplished without incident. The other burial was the highly contaminated and defective H-4 pot. A concrete burial box with 6" thick walls was built for the purpose, and weighed, together with the contaminated equipment, 35 tons.

III. ORGANIZATION AND PERSONNEL

A. Safety and Security

No disabling injuries were incurred by the Operation.

No breach of security was experienced.

B. Personnel Activities

Three craft training sessions were held and were attended by 45 craftsmen.

Frank T. Benson Acting Manager
Power & General Maintenance Operation

CHEMICAL PROCESSING DEPARTMENT
FINANCIAL OPERATION

OCTOBER, 1958

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Product Cost

New field overtime reporting procedures were instituted in order to accommodate the increasing volume of special requests for segregations of overtime where the incurring operation is not responsible for the overtime. In general, the procedure calls for blanket customer authorizations, and automatic segregation of all overtime into captions indicative of responsibility.

As a result of Product Cost's joint efforts with Power and General Maintenance, the analysis of vehicle rental charges resulted in the receipt of approximately \$500 in retroactive credits and reduction of future charges by approximately \$250 per month.

Discussions were continued with Purex management in an effort to determine an appropriate segregation of costs for the Palm program. An approximate determination was made for Midyear Budget Review purposes and a more exact determination for the purposes of actual cost distribution is in process.

A routine quarterly spot audit of Stores distributions for the week ending October 19 was conducted. Coding, pricing and authorizations were checked. In a number of cases where improper authorizations were noted, the receipt of appropriate approvals was expedited.

The combination of two weeks cost-to-date runs into a single tabulation occasioned some difficulty in work scheduling and work order overrun monitoring. The Operation was advised by Computing Services that the EDPM equipment was overloaded, necessitating the combination of the runs.

At the request of the AEC, a ten-year forecast of CPD production costs through the button operation was prepared and submitted to IPD for consolidation.

The prototype status report was issued by the ozomatic process for the first time in October, resulting in a savings of approximately one-half day of typing and proofreading time.

B. Personnel Accounting

Payroll preparation during October was fraught with many difficulties and complications arising from changes in employee compensation and benefits coupled with payroll procedural changes. The principal cause of difficulty was the necessity of calculating a 3.48% retro-active (to October 1) salary increase for unit people who elected not to participate in the Company's new Savings and Security Program. Because October 1 was near midweek, it was necessary to calculate the payroll as if it were two separate weeks, yet combine the results into one check. This "split" payroll resulted in an error which was expected but could not be prevented in the calculation of dependent insurance.

Another error occurred in the case of employees whose earnings had just exceeded \$4,200. In the case of unit people a 3% pension contribution on salary over \$4,200 is required, while nonunit people contribute on the basis of 4%; however, the machine calculation was based on only a 1% contribution of the whole compensation received.

It is believed, based on recent discussions with Computing personnel, that these problems will be resolved as a result of strengthened programs, nevertheless considerable time and effort was required to correct records and answer questions from employees.

Statistics - Salary Payments

	<u>Gross Payroll</u>		<u>Overtime Payments</u>	
	<u>October</u>	<u>September</u>	<u>October</u>	<u>September</u>
Nonexempt	\$ 698 847*	\$554 537**	\$ 9 602*	\$10 708**
Exempt	<u>339 558</u>	<u>342 514</u>	<u>1 655</u>	<u>2 634</u>
Total	<u>\$1 038 405</u>	<u>\$897 051</u>	<u>\$11 257</u>	<u>\$13 342</u>

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

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

C. General Accounting

During October, CPD Finance prepared 100 voucher checks totaling \$267,080.71. General Books issued 28 of these checks totaling \$4,838.52. No checks for contamination of personal effects were issued.

CPD's participant in the Geneva Atoms for Peace Conference was provided with special assistance in preparing his expense report for submission to the State Department. The report was submitted to Washington, D.C., for reimbursement in October business.

Effective October 20, the Civil Aeronautics Administration authorized the airlines to increase fares by elimination of the 5% discount on

round-trip fares, elimination of the stop-over privileges on the through fares, and reduction of discount on the family-plan rates. The effect of these changes is as follows:

1. All fares will be constructed on the straight, one-way fares.
2. "Stop-overs" en route will eliminate the application of through fares, and fares will be constructed on the combination of local fares which will be higher than the through fares.
3. On family-plan rates, the 50% reduction will be reduced to 33-1/3%.

The September General Ledger Trial Balance and reports of Travel and Living expense were delivered to Contract Accounting on schedule.

As of September 30, 1958, expenditures and commitments of \$9,658,000 and \$1,286,000, respectively, had been incurred against active CPD projects with \$14,122,000 authorized funds.

A Physical Completion Notice was received for Project CG-756, Fire Resistant Exhaust Filters - Z Plant and the cost closing is in process.

Project authorizations received from the AEC during October were: An increase in the interim authorization from \$7,000 to \$45,000 to provide design and management services for CGC-813, Plutonium Recovery from Contaminated Materials - 234-5 Building; an interim authorization of \$125,000 to initiate design and management services for Project CGC-811, Additional Plutonium Fabrication Facilities - 234-5 Building; and an additional authorization for Part B of Project CGC-767, Miscellaneous Improvements UO3 Plant.

The transfer of 231-Z Building, and related equipment, to HLO was completed during the month.

A detailed procedure for the journalization of capital plant and equipment transfers and retirement was completed. The procedure will be incorporated in the General Accounting Procedures Manual.

D. Auditing

An audit of Employee Awards and Recognition Plans was completed. The audit included certification of CPD employees eligibility for safety awards, service pins, and attendance awards.

Field work in connection with an audit of Material and Package Passes was completed; however, the audit will not be finalized until certain procedures to strengthen control of construction material passes are arranged with the AEC.

Field work was started in connection with audits of Management of Capital Assets and Payroll and Timekeeping Practices (nonexempt).

CPD's tentative audit schedule for the audit year ending July 31, 1959, was submitted to the AEC.

A meeting was held with a member of the AEC Audit Branch and AEC Legal to review the audit report relating to Contract No. AT(45-1) 1179 - Jensen-Rasmussen and Company.

E. Procedures

The trial run of a new procedure for accumulating job information for the Buildings and Grounds unit of the Power and General Maintenance Operation was completed. The results appear to be very satisfactory.

In conjunction with the IPD Specialist - Procedures a program for the development of a completely integrated data processing system was inaugurated.

The trial run on conversion of ledgers to a unit ticket system was most satisfactory. Use of the new system permitted the issuance of engineering operating statements for October on November 4 and 5, which is one to two days earlier than normal.

F. Measurements

The CPD Measurements Report for the third quarter of CY 1958, outlining progress toward Department goals, was prepared and issued.

A CPD Productivity Statement for the third quarter and first nine months of CY 1958 was prepared and issued.

Cost and production analysis reports for Redox, Purex, and Finished Products comparing actual costs and production with forecast were prepared and issued to interested Level 3 managers.

III. ORGANIZATION AND PERSONNEL

A. Safety and Security

A safety and security meeting for all Financial Operation personnel was held on October 24, 1958.

No medical treatments, disabling injuries, or security violations were experienced during the month.

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B. Reports Issued

HW-57651	CPD Operating Report - September	M. M. McDonald
HW-57742	Essential Material Inventory and Consumption Report - September	G. E. Dyreng
HW-57765	September Unit Cost Information	B. M. Dobbs
HW-57783	Purex Cost and Production Analysis - Sept.	G. H. Temple
HW-57784	Redox Cost and Production Analysis - Sept.	G. H. Temple
HW-57785	Finished Products Cost and Production Analysis - September	G. H. Temple
CLVI-521	CPD Cost and Production Analysis - Sept.	K. G. Grimm
TS - RD	Product Cost Report - September	B. M. Dobbs

Manager - Finance

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November 7, 1958

CHEMICAL PROCESSING DEPARTMENT
FACILITIES ENGINEERING OPERATION

October, 1958

I. RESPONSIBILITY

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

II. ACHIEVEMENTS

PUREX OPERATION

A. Research and Development

Highlights of Rare Gas Processing

Representatives of Air Products Co. visited Hanford during the week of October 6, 1958, to present the highlights of the proposed rare gas recovery process. These include:

1. Compression of feed gas to 800 psig.
2. Oxidation of acetylene in the gas over a platinum-rhodium catalyst.
3. Storage of gas at 800 psig for 160 seconds for oxidation of NO into NO₂.
4. Cooling of gas and removal of NO₂ -N₂O₄ through the use of regenerators.
5. Distillation of compressed cooled gas at 45 psia and at liquid oxygen temperatures to form a concentrated product containing the rare gas.
6. Use of a titanium "getter" to remove residual oxygen and nitrogen.
7. Batch distillation to partition the krypton from the xenon under Case II.

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Discussions with AEC Division of Production

On October 28, 1958, a representative of the AEC Division of Production visited Hanford to discuss the overall rare gas recovery problem. The following information relevant to the subject was obtained during the discussions:

1. At the present time, the recovery of xenon is apparently of greater importance than the recovery of krypton.
2. The market picture of both krypton and xenon has not been completely defined. Evidently military and government-sponsored applications are of greater importance than strictly commercial applications.
3. Presentation of the results of both the Hanford and Savannah River process studies for Case I, II and III can be deferred until January 1, 1959.

Palm Recovery

Engineering feasibility of the canyon portion of a batch ion exchange process for the recovery of neptunium production from the Purex 3WB stream was established. Designs covering equipment arrangements in the canyon and a geometrically-safe, ion exchange column were completed. Laboratory results to date, however, show extremely low capacity of the proposed ion exchange resin for the neptunium product, limiting the current feasibility of ion exchange flow-sheets whether continuous or batch.

Supporting engineering studies on solvent extraction processes are also underway. Currently a new pulse column is being considered for installation downstream of either the LBX or 2D column. Indications are that reliable in-line canyon pump installations and a critically-safe 2AF tank installation would also be needed. From these standpoints, the solvent extraction processes appear to be at least as costly as any of the ion exchange processes studied to date.

Preliminary engineering studies on the final purification and concentration systems for neptunium have been initiated, although a firm chemical flowsheet has not been provided. The sample gallery and the storage gallery are being studied to determine the most suitable place for this equipment. The storage gallery location, although more costly, may represent the only feasible approach for a space standpoint, if nuclear safety restrictions are imposed upon the process equipment.

Pu Recovery from LWV

The Purex LWV Pu recovery prototype installation has been completed and is ready for start-up early in November. The waste resin sampler and bed depth signal design drawings are in the comment stage and should be completed in November. Neither of these special development items is required to operate the resin column initially.

B. Plant Engineering

Anion Exchange Conversion

Scope drawings covering the remainder of necessary and justifiable changes to the final Pu Ion Exchange System have been completed. The definitive process design covering the cost estimates, justification for work, and operating parameters of the proposed system will be issued within two weeks to serve as a basis for a project proposal.

Burial Container

Drawings for the HA column scrub section burial container have been completed. A 48-inch O.D. corrugated pipe forms the container. Cost estimates indicate that the new design will cost approximately 15 per cent less than a standard wooden box.

HS Column

An examination and recommendation for repair of the failed HS column at Purex were made. The failure was traceable to certain features in the basic design plus high welding stresses caused by the geometry of the package. Two cracks in base material and welds at boot assemblies to shell were successfully repaired and additional stiffening plates applied for improved distribution of stresses.

REDOX OPERATION

A. Research and Development

Waste Tank Leakage Detection

A radiation detection probe is being fabricated that can be used in the test laterals which will be driven under the 113-SX waste storage tank. The first probe, a highly sensitive scintillation detector will be used in the initial tests. However, test work may show that a high degree of sensitivity will not be required for permanent monitoring facilities. Therefore, the more stable and rugged types of ion chamber and GM tube are being considered for this application.

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B. Plant Engineering

Redesigned Tube Bundle - Redox Concentrators

A new type of reboiler tube bundle has been designed to replace the present bayonet type now used in D-12, F-2 and G-3 vessels. The new bundle is a helix-type to improve efficiency, trap operation, and assembly cost. The necessary engineering information and sketches have been forwarded to the Drafting Operation.

FINISHED PRODUCTS OPERATION

A. Research and Development

Weapons

A document, HW-57857, was prepared and issued during the month describing the detailed basis on which to make a project construction cost estimate on Project CG-811. Although this document is not intended to describe the design scope of the project, the cost estimate was based on the most accurate description that could be made of the project at that time. It is expected that the final design scope will be described in a series of scope documents each of which will cover one particular portion of the overall project.

Studies are being made on a continuing basis on methods of expanding the fabrication line beyond the phase of work initially planned for Project CGC-811. The results of these studies were documented during the month in an interim report, HW-57768 RD, which was issued by the Process Design and Development Operation.

B. Process Technology

Chemical Processing and Reduction

Task III Design Work

All design work was completed during the month on reactivating the pickling hood in the RMA Task III area. Also design work was completed on converting the Task III balance to permit it to measure density of buttons and other shapes.

26-Inch Vacuum System

Recent difficulties with the 26-inch house vacuum system in the 234-5 Building have seriously interfered with the process operation of the

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continuous Task I and Task II equipment. For this reason studies were initiated during the month to determine methods for achieving greater reliability of the vacuum system. A report was issued during the latter part of the month which contained recommendations for several needed changes to the system. Among these changes were:

1. Provide a third pump in parallel with the existing two in order to increase the capacity of the system and to provide an in-line spare pumping unit.
2. Provide moisture-removing equipment and filters at certain points throughout the system in order to prevent carryover of liquids and powders into the vacuum system.
3. Install a by-pass header system in the duct level so that the present vacuum loop header can be taken out of service without affecting the principal process components in the building.

C. Project Activities

CG-734, RMC Button Line

A review meeting on project CG-734 was held to determine whether Hood H9B should be relocated into the RMC line as presently planned or whether it should be discarded and a replacement hood designed which would provide greater improvement in personnel exposure. It was decided that the scope of the project would not be changed, that Hood 9 would not be changed, and that Hood 9B would be modified to make it equivalent to Hood H9A and then relocated into the RMC line. Paralleling this effort, work will be initiated immediately on the design of a replacement hood that would permit processing of material through the RMC line with a higher integrated exposure than can presently be processed. In addition the arrangement of the Task III hood ventilation was reviewed to determine what changes, if any, should be made to permit later processing of chloride material through the RMC Line. The initial results of this review show that few, if any, changes will be needed.

CGC-811, Preliminary Project Proposal, Additional Plutonium Fabrication Facilities, 234-5 Building

Directive HW-475, dated October 7, 1958, authorized the requested funds of \$125,000 to initiate design for this project.

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GENERAL ACTIVITIES

A. Research and Development

NPR Studies

Studies have been completed to determine the separations' capital and reprocessing costs associated with various NPR alternates. A report was completed summarizing all of these alternates and outlining a method of proportioning fixed costs between lots of production, non-production, and new production reactors as a function of batch size and turn-around frequency.

Power Reactor Fuels Reprocessing

Preliminary designs covering receiving, storage, and mechanical treatment of power reactor fuel elements at U Plant were completed. In addition, similar designs by the Hanford Laboratories covering various Redox alternates were reviewed. These designs are all being estimated and evaluated by Advance Process Development. Work is continuing on the development of suitable transportation equipment concepts and designs.

Preparation of cell diagrams and simplified equipment process designs for seven alternates of non-production reactor fuels dissolving in the Redox Plant were completed, and cost estimates covering these alternates were obtained in support of the overall evaluation of the program being made by Advance Process Development. Work covering similar U Plant alternates is underway. Initial indications are that more cells will be required at U Plant for some of these alternates than was originally conceived. For example, the Zirflex dissolver system may require up to four cells rather than the two originally established. Darex appears to fit in the two cells specified originally. Centrifugation and concentration control functions are expected to require two cells, and solution storage and transfer, an additional three cells. Approximately eleven cells are expected to be required for the alternate requiring the most building space.

Waste Storage

Contract negotiations have been initiated with the University of Washington, to make a seismological analysis of the HAP0 area relating to the seismic influence on certain plant facilities.

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B. Process Technology

Maintenance Management Seminar

A program for improving the management of the maintenance function was presented to CPD management during the month. The seminar was based on principles of performance measurements and standards. The goal of the program is to improve maintenance productivity and equipment quality.

Waste Disposal to Vadose Zone

A rough draft was prepared of the study for isolation of abandoned or depleted waste disposal sites. This study is a part of the five year program for disposal of radioactive wastes.

C. Project Activities

Project cost information as of October 19, 1958:

Total authorized funds - active projects	\$13,943.000
Total cost to date	9,620,000
Commitments and open work releases	1,861,000
Unencumbered balance	2,462,000
Costs charged to above projects September 21, 1958 to October 19, 1958	245,000

Project CG-756 was dropped from active status during this period.

Authorized Funds \$300,000 - Total Cost \$169,365

III. ORGANIZATION AND PERSONNEL

A. Personnel

No changes.

B. Safety

Safety performance continues to be excellent with only one minor injury reported for the month.

C. Inventions

None

D. Security

This Operation completed another successful month without a security violation.

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E. Reports Issued

HW-57755 RD Project CG-723 Present Status and Future Requirements, by E. O. Swain, dated October 13, 1958.

HW-57768 RD Fabrication Line Expansion - 234-5 Building, by E. O. Swain and J. W. Kolb, dated October 7, 1958.

HW-57843 RD Report on Visit to other Divisions of Military Application Sites, by J. W. Kolb, dated October 6, 1958.

HW-57857 Basis for Preparation of Cost Estimate, Project CGC-811, Phase I, by R. A. Ciccarelli, dated September 26, 1958.

HW-58025 Twenty-Six Inch House Vacuum System, 234-5 Building, by R. A. Ciccarelli, dated October 31, 1958.

HW-57799 Turbo-Generator Failure - 284-W Building, by J. F. Kane and R. A. Kennedy, dated October 15, 1958.

HW-57733 Corrosion of Buried Piping - 202-S Building, by K. K. Campbell, dated October 17, 1958.

HW-54739 Project Proposal, Project Palm (CG-821), by J. R. LaRiviere, dated September 30, 1958.

HW-53326 Project Proposal, Revision 3, Miscellaneous Improvements UO₃ Plant, by D. W. McKee, dated October 3, 1958.

HW-57202 Project Proposal, Revision 2, Project CG-789, by R. H. Silletto, dated September 15, 1958.

HW-57203 RD Plant and Equipment Analysis Report, Project CG-789, Revision 2, by R. H. Silletto, dated September 11, 1958.

HW-57233 Project Proposal, Revision 1, Project CGC-811, by D. A. Snyder, dated October 17, 1958.

HW-57813 Plant and Equipment Analysis Report, Project CGC-811, by D. A. Snyder, dated October 16, 1958.

HW-57879 Project Proposal, Revision 1, Project CAC-812, by R. C. Baker, dated October 23, 1958.

F. Trips

L. R. Michels visited Air Products, Inc. at Trexlertown, Pennsylvania, on October 20 and 21, 1958, for continued liaison on contract DDR-45 and the Brookhaven National Laboratory on October 22 to obtain information on the Freon-12 process for recovery of rare gas.

R. A. Kennedy visited Savannah River and Oak Ridge during the week of October 27 to discuss mutual problems of fuel element receiving, handling, and mechanical treatment.

J. R. Fritz visited suppliers of process equipment for Project CG-734 in the Portland, Oregon area on October 1, 1958.

R. C. Hollingshead visited George Gorton Company, Racine, Wisconsin from September 29 to October 3, 1958, for design consultation and to witness tests on lathes being fabricated for Project CG-745. He also visited Pratt and Whitney Company at Hartford, Connecticut to check progress on a drill and tap machine being fabricated for HAPO.

On October 1, 1958, G. P. Kesel visited Northwest Copper Company, Portland, Oregon to review rejected equipment for Project CG-734 and determine necessary corrective measures.

G. Visitors

F. P. Robinson, General Electric Apparatus Department, Pasco, visited the plant October 6 to assist in the preparation of the ACA motor (224-UA) for shipment to Buffalo.

Ken Watson, Manufacturing Services - Schenectady, visited 200-W Area October 1 to discuss water management and waste disposal.

L. E. Clover and H. P. Ransom from Manufacturing Services in Schenectady visited HAPO October 20 through October 24 to gain a general picture of HAPO facilities and to discuss problems of maintenance engineering, plant engineering, and management of maintenance activities.

G. Fedorko and J. Tompkins of Air Products visited Hanford during the week of October 6, 1958, to review the overall Purex dissolving system, to sample Purex dissolver off-gas for acetylene, and to present the proposed flow sheet for rare gas recovery.

Frank Baranowski of the AEC Division of Production conferred with members of the Chemical Processing Department on October 28, 1958, on rare gas recovery.

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Dr. Frank Neumann, Seismologist, University of Washington, visited CPD
October 15, 1958.

Manager

Facilities Engineering Operation

HP Shaw:FC:mh

CHEMICAL PROCESSING DEPARTMENT
RESEARCH AND ENGINEERING OPERATION

OCTOBER, 1958

PUREX PROCESS TECHNOLOGY

Feed Preparation

Irradiated uranium with cooling times of 92 to 115 days was dissolved to form solvent extraction feed. Despite regeneration of the vessel vent silver reactor, the radiiodine emissions approached two curies per day, and consequently 5×10^{-4} M mercuric nitrate was added to the metal solution storage tanks. Subsequent iodine releases dropped to about 0.4 curies per day.

Operation of the first ammonia scrubber which was installed in A Cell, has been satisfactory, although no measure of the efficiency has been made. A fifteen percent reduction in the reflux water flow (from the design rate) and some adjustment of the maximum dissolver pot vacuum (to less than seven inches of water) were necessary to insure proper hydraulic operation of the scrubber. Additional scrubbers are to be installed in the other two dissolver cells whenever production schedules will permit temporary deactivation of the equipment.

The acetylene content of dissolver off-gases was established as less than one part per million.

Solvent Extraction

The solvent extraction system operated for 73 percent of the month at capacity factors ranging 1.92 to 3.2. Sustained operation at CF = 3.2 was demonstrated both without and with the HS Column installed. Typical performance data for the system with the HS Column bypassed are summarized below:

Cycle	Log Decontamination Factor, dF.		Instantaneous Loss, Percent	Recycle Percent	
	Plutonium	Uranium	Plutonium	Plutonium	Uranium
First	4.0	4.3	0.08	-	-
Final	3.5	2.3	0.007	5.0	1.7
Ion Exchange	0.7	-	-	-	5.0
Overall	8.2	6.6	0.087	5.0	6.7

After plant startup on October 13, the primary objective was to demonstrate sustained plant processing at CF = 3.2. When the plant operation had leveled out at CF = 2.4, the rate was progressively increased to 2.64, 3.0, and

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finally 3.2. Because the present XAF pump in N Cell has a comparatively low capacity, the IBX flow rate was maintained at CF = 2.64, as were the flow ratios for the IBS, 2A, 2B, and the Plutonium Ion Exchange Columns. In addition, the ICX flow remained at an equivalent CF = 2.88 flow at 65° C.

Equilibrium operation was excellent, and the only significant change in intercycle stream compositions was a six-fold increase in the plutonium concentration of the IBU. Despite this increase, the normal flowsheet amount of ferrous iron added to the 2DF continued to produce uranium within the plutonium specifications. However, when a neptunium recovery test involved temporarily increasing the HSS nitric acid concentration from 2.0 to 2.5 M, the plutonium in the IBU rose another three fold. The reported uranium product plutonium concentration peaked four fold above the ten parts per billion specification, but it has since been established that the high analyses resulted from an interference in the laboratory method for determining plutonium in uranium. One batch of IWW was segregated for rework after a high HAW plutonium loss (up to 2.7 percent) resulted from an attempt to improve decontamination by increased uranium saturation in the HA Column organic.

The major effort during the month was directed toward improving plant decontamination performance at the higher processing rates, and simultaneously accumulating neptunium in the backcycle system. However, the uranium product continued to exceed the 2.0 gamma ratio specification by factors of 1.5 to 2.5. Flowsheet changes which had no appreciable effect on the overall decontamination performance included the following: (a) increased HAO flow (up to 65 flows), (b) higher 2DF temperature (up to 55° C), (c) increased 2D Column pulse frequency, and (d) both reduced and increased 2DIS nitric acid concentration. Optimum process performance was hampered by process upsets which resulted from recycled HAW in the 3WB to recover high plutonium start-up losses, minor flooding tendencies in the HA Column, and a temporary failure of the demineralized water flow due to plugged filters. All the uranium product was successfully processed through the silica gel facility at rates ranging from CF = 1.92 to 2.40. Operation of the facility at 80° C reduced the gamma ratio of the uranium from the 2.5 to 5.0 range (seventy percent zirconium-niobium; thirty percent ruthenium) to a 1.4 to 2.0 range on a "once-through" basis.

The majority of the plutonium gamma activity analyses showed the material was acceptable for shipment to the 234-5 Building, although several batches were recycled to head end following gamma bursts produced by the plant upsets mentioned above.

On October 28, the HS Column, which had been successfully decontaminated and repaired, was reinstalled while the HA Column was shutdown for eight hours. Although the 2AF and 2DF gamma activity levels each decreased by a factor of two, a further two-fold reduction is required to bring the levels down to those experienced during previous HS Column operation. Unless the higher gamma activity levels are caused by the higher processing rate, or the HA Column flowsheet change (i.e., nitrite addition to HAO) required for neptunium recovery, adjustment of flowsheet and operating variables should reproduce the previously attained levels.

Other items of interest in solvent extraction were:

- a) Rework of miscellaneous wastes was performed without incident after the material had been refluxed for 32 days. Previous rework attempts after up to 28 days of refluxing had shown some indication of increased gamma activity in the plant.
- b) The acidity of the HAW was increased from 2.3 to 2.5 M by adjustments of the 3WB flow and acidity, and the HAF acidity.
- c) Minor downward adjustments in HA and 2A Column pulse frequencies were required to stabilize the operation of the columns at CF = 3.2. After the 2AS flow was reduced 26 percent and the 2AF temperature was increased from 52° to 55° C, the 2A Column pulse frequency was returned to normal.
- d) When the latest IWW rework tended to increase the HAW plutonium loss because of a high sulfate concentration, the HAX was increased, and the lower uranium saturation in the organic reduced the overall decontamination.
- e) A hot fifty percent nitric acid flush during shutdown followed by a hot five percent sodium carbonate flush failed to improve decontamination performance of the 2D Column.

Neptunium Recovery

Because one principal objective of this run period was to demonstrate plant operation at a 3.2 capacity factor, emphasis could not be placed on neptunium recovery flowsheet development. However, with routine addition of sodium nitrite to the HAO stream, during the capacity test (during operation at CF = 3.0) essentially quantitative neptunium recovery was achieved in the HA Column. After several days the neptunium accumulation in the backcycle stream was lost via the HAW when the uranium saturation in the HA Column organic phase was increased to improve decontamination performance. An attempt to re-establish neptunium recovery by increasing the nitrite addition to the HAO by seventy percent (with a corresponding increase in the sulfamate ion in the IBX stream to guard against a possible loss of partitioning in the IBX Column) appears to have a positive effect. An increase in the HSS nitric acid concentration from 2.0 to 2.5 M apparently upset the IBX Column equilibrium and seemingly caused an increase in the plutonium content of the uranium product; thus the test was terminated. (See Solvent Extraction).

Plutonium Ion Exchange

During the shutdown period an alternate routing was installed to permit transfer of the XSW stream to the 3WB Tank as well as to the XAF Tank.

Use of this routing has increased the capacity and efficiency of the unit by reducing the load on the XAF pump and increasing the XA Column residence time approximately fifteen percent. Performance of the unit has been excellent with normal waste losses ranging between five and ten percent, which is a five-fold improvement over previous operations at comparable throughput rates. The waste loss improvement resulted from adjustment of the XA Column operating temperature to nearer 60° C, plus the lower volume velocity through the column. As in the past, the XAS flow was increased to 200 percent during periods of high gamma activity in the 2BP, but now it is doubtful that a significant increase in decontamination results.

The XCP stream was temporarily routed into L Cell Package and concentrated in E-14 while the N Cell concentrator loop was replaced after a corrosion leak developed in a dip tube weld.

Solvent Treatment

Five percent oxalic acid flushes during the shutdown period removed accumulated MnO₂ from the aqueous recirculation system of the batch-wash tank. The gamma activities of the No. 1 and No. 2 Solvent Systems remained normal at approximately 1800 and 75 uc/gal., respectively. The overall solvent loss for the month was 0.3 percent of the solvent throughput.

Waste Treatment and Acid Recovery

Performance of the Waste Treatment and Acid Recovery sections of the plant has been excellent during the month. Improved operation of the Acid Concentrator, E-F6, resulted from converting to weight factor control of the steam from specific gravity control. Continued efforts in IWW flow control produced less than flowsheet flow rate (flowsheet = 5.0 flows) for an extended operating period. Waste rework operations recovered approximately 520 grams of plutonium and 1380 pounds of uranium.

Waste volumes sent to the underground storage tanks during the month averaged 56, 347, 8 and 171 gallons per ton of uranium for neutralized IWW, solvent washes, centrifuge cleanouts and cell drainage, respectively. The coating waste volume sent to storage was 249 gallons per ton of uranium. Overall plutonium and uranium losses for the month were 0.26 and 0.08 percent, respectively. Coating waste losses for plutonium and uranium, based on revised standard values, accounted for 18 and 25 percent, respectively, of the overall losses.

The anion exchange prototype for the recovery of plutonium from IWW has been installed, and operability tests are in progress.

Self-concentration continues in 241-A Tanks 101, 102, and 103 at 5.0, 12.1, and 1.5 gallons per minute, respectively. After eight months of receiving waste, TK-102 contains 38 percent of the demonstrated 8 M terminal sodium ion concentration permitted at the current hydrostatic head limit.

DECLASSIFIEDREDOX TECHNOLOGY OPERATIONAcid Recovery and Iodine Removal

The efficiency of the acid recovery system averaged 78.4 percent during the "accountability" run despite sporadic operation of the dissolvers. Insufficient data were obtained to permit accurate evaluation of the effectiveness of the secondary scrubber; however, the efficiency of the absorber alone, during earlier, comparable periods of operation, averaged approximately 68 percent.

The emission of iodine-131 to the stack averaged 0.16 curie per day with approximately 60 percent of this amount being released in relatively short periods following week-end shut downs of the building. This pattern appears to agree with the conclusion drawn in August that radiolytic reduction of the iodate ion may be responsible for the emission of iodine from the condenser vent system.

Dissolution

During removal of the failed B-2 dissolver an un-dissolved heel was observed, estimated at 1000 to 1500 pounds of uranium. The dissolver was returned to the cell for coating removal and an additional heel removal step. Qualitative analyses of the coating removal solution revealed little, if any, aluminum had been removed. Subsequent digestion of the heel for a twenty-four hour period, during which time steam leakage reduced the acid concentration from 13 to 7 molar, dissolved only 170 pounds of uranium. Two of the un-dissolved slugs were subsequently removed from the dissolver for metallurgical inspection and chemical analyses.

The routine processing of E-metal (0.94 percent uranium-235 before irradiation) began during the latter part of the report period with the charging of 2.5 and 2.15 tons of E-metal to the A and C dissolvers, respectively. These charges, which are less than half the calculated minimum critical amount and hence do not require the use of a soluble poison, will be dissolved in two steps, the second step being aimed at complete removal of the heel.

Solvent Extraction

The major portion of the report period was devoted to the processing of 55 tons of carefully selected irradiated uranium and to the preceding and subsequent flushing necessary to permit a check on the accuracy of SS material accounting. The recovery of 48 units of plutonium and 75 pounds of uranium in the second 10 percent nitric acid flush, compared with 103 units of plutonium and 209 pounds of uranium in the first acid flush, indicates the need for improving flushing techniques, and possibly product stability, prior to the processing of uranium of enrichments greater than that of E-metal.

DECLASSIFIEDWaste Storage

Settling of sludge in the 115-SX tank, currently being heated up for active service, caused the temperature measured at the one-inch level to rise approximately 15 F above the temperature at the four-inch level and about 30 F higher than the average liquid temperature. When minor variations in liquid level were observed on October 13, a sounding of the tank bottom was made which indicated the liner to be raised three inches above its original elevation which had been confirmed by soundings made as late as October 2. The injection of approximately 90,000 gallons of water into the tank reduced the average solution temperature 38 F but lowered the sludge temperature only 10 F, despite the agitation provided by two circulators. Concurrently the tank liner returned to within a half-inch of its original position and remained there throughout the report period in spite of a 30 F increase in the average solution temperature.

FINISHED PRODUCTS TECHNOLOGY OPERATIONURANIUM CONVERSION OPERATIONProcess Performance

All UO_3 produced met product specifications.

One thousand two (1002) pounds of nitric acid per ton of uranium processed (95% of theoretical) were recovered at an average concentration of 47%.

The average operating rate of the calciners was 7.0 tons uranium per unit for each day on the line. The overall calciner operating efficiency was 96%.

The powder handling system operated satisfactorily during the month. The pneumatic conveyor system demonstrated adequate UO_3 pick-up capacity with all calciners on the line.

Process Improvement

The filter aid test filter was used routinely for sump waste (C-2) service for a period of several weeks. It was also utilized in filtering 10,000 gallons of accumulated concentrated waste which was sent to Redox for reprocessing. While the filtering rate in the latter service was low, about 3 gpm, excellent clean-up was accomplished.

Relocation of the calciner primary feed valve and installation of the feed line air purge has been completed in J, K, L, and M cells to facilitate start-up of the units following periods of extended shut-down. Performance of this system continues to be excellent.

METAL FINISHING OPERATIONRecuplex

Fifty-five runs, consisting of fragments, powders, crucibles, and clean-outs, were processed through the S and C Hood. Slurry losses to crib averaged 0.38% of the recovered plutonium.

The SE columns processed 1570 liters per day at an operating efficiency of 72% for an average instantaneous rate of 2180 liters per day. Waste losses averaged 0.0066 g/L, or 0.52% of the feed plutonium. The use of Mistron 25, a deemulsifier, in amounts of 50 - 100 ppm of plutonium feed solution, has continued to allow about a 30% increase in the feed rates to the columns before flooding. There have been no apparent difficulties in the solvent extraction system resulting from the use of Mistron 25 after six weeks of operation.

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A continuous plutonium metal dissolver was operated to demonstrate feasibility and explore flowsheet conditions. The product solution averaged 10 M HNO_3 and 120 g/L Pu with an acid (13 M HNO_3 - 0.25 M HF) feed rate of about one liter per hour.

Continuous Task I - II

Two hundred twenty-nine (229) runs were processed with an average filtrate recycle of 3.02%.

Operation of the second continuous unit (Hood 9-A) continued to be good. During one period of two weeks, the unit operated at an average instantaneous rate of 103.7% of design capacity with an average filtrate recycle of 0.95%.

Early in the month an extremely wet oxalate cake from the vacuum drum filter was found to be caused by insufficient agitation in the reactor tank. The slow speed of the agitator could not lift the heavier solids, and only the fine precipitate would overflow to the vacuum drum filter.

A carbon filter element, with a nominal pore size of 40 microns, is now being used as the primary filter in the hydrofluorinator off-gas system. It was necessary to return to the use of carbon as a filter media when the one remaining metal (Hastaloy C) filter failed.

PROCESS CHEMISTRY OPERATIONREDOX PROCESS STUDIESDistillation of HNO_3 From Highly Salted Solutions

In considering a flowsheet for processing relatively high acid ($\sim 1 \text{ M } \text{HNO}_3$) solutions of reclaimed uranium in the Redox Plant, it became apparent that special precautions might be required to prevent the build-up, through recycle, of nitric acid in the system. Accordingly, a laboratory study was made of the removal of nitric acid from the recycled stream by distillation in the D-14 backcycle concentrator. The study showed that the continuous addition of $1.5 \text{ M } \text{HNO}_3$ to a boiling solution of $2.5 \text{ M } \text{Al}(\text{NO}_3)_3$, $1.0 \text{ M } \text{NaNO}_3$, $0.05 \text{ M } \text{UO}_2(\text{NO}_3)_3$, and $0.05 \text{ M } \text{Na}_2\text{Cr}_2\text{O}_7$, at a rate such that there was no change in volume of the boiling solution, resulted in a steady-state acid concentration of about 1.3 M . Consequently, the distillation process in D-14 should be adequate, although the high clearing point of the solution (55°C) will require care in handling. A similar experiment, adding HNO_3 to boiling $2.5 \text{ M } \text{UNH}$, gave a steady-state nitric acid concentration of about 5 M .

NEPTUNIUM PROCESSINGPurex Flowsheet Studies

As part of the HAP0 program to develop an oxidized-neptunium flowsheet for neptunium recovery in Purex, the effectiveness of three oxidants ($0.101 \text{ M } \text{Na}_2\text{Cr}_2\text{O}_7$, $0.01 \text{ M } \text{KMnO}_4$, and $0.01 \text{ M } \text{MnO}_2$) in oxidizing plutonium and neptunium in Purex HAF was compared. The results, obtained by measuring extraction coefficients under simulated HA feed point conditions, showed no change from the initial value of 1.1 in the plutonium E_a° over a four hour oxidation period and indicated that no oxidation of the plutonium(IV) to plutonium(VI) occurred with any of the oxidants. The extraction coefficient for the neptunium increased from an initial (pre-oxidation) value of 0.77 to about 1.4, regardless of which oxidant was used, showing that all were equally effective in converting the original neptunium(IV-V) mixture to neptunium(VI).

Redox Flowsheet Studies

In conjunction with HLO work on a flowsheet for the recovery of neptunium in the Redox Plant, a laboratory study of various processing schemes has been started. The data obtained thus far point to the following conclusions:

- 1) The path of neptunium in the HA column can be controlled by control of the acidity. Under acid-deficient conditions, most of the neptunium will go into the aqueous waste (HAW), while operation on an acid flowsheet will put the neptunium into the organic product (HAP). The best conditions are not as yet worked out.
- 2) Neptunium can be stripped from the organic in the HC column. E_a° values of less than 0.01 were measured for this system.

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- 3) It does not appear that neptunium can be put into the organic phase in the 1A column under acid-deficient conditions, even with the use of a strong holding oxidant (e.g., 0.01 M Ce(IV) or 0.1 M $S_2O_8^{2-}$) to try to hold it as neptunium(VI).
- 4) An attempt to achieve neptunium-plutonium separation in an acid (0.5 M) partition column failed. Extraction coefficients for neptunium, measured in the presence of ferrous ion, were less than 0.2.

Results thus far suggest the following processing scheme:

a) run an acid system in the HA-HS columns, for neptunium extraction; b) run an acid-deficient system in the 1A column, to recycle neptunium back to the first cycle; c) after sufficient neptunium build-up, shut off the virgin feed to the first cycle and continue to operate on recycle, holding the neptunium but moving the uranium and plutonium on through the plant; and d) once sufficient uranium and plutonium decontamination is achieved, operate an acid system in 1A to move the neptunium into the organic product (1AP) and strip in the 1B column.

ANALYTICAL ASSISTANCE

Bausch and Lomb Spectrophotometer

In an effort to provide a spectrophotometer more adapted to control laboratory needs than the present Beckman Model DU, a line-operated, printed circuit Bausch and Lomb Spectronic 20 was purchased for evaluation. Initial tests show (1) that the instrument is quite stable to variations in input voltage, with only a 2-4 % deviation per five volt change in input voltage, and (2) that results comparable to those obtained using the Beckman Model DU are obtained on colorimetric iron analyses. The instrument has been placed in service by the Purex Control Laboratory and its performance is currently being studied in routine operation.

Analysis of Recuplex D-10 Tank Sludge

At the request of the SS Accountability Operation, a Recuplex D-10 Tank slurry (drawn from the bottom of the D-10 tank and containing ~10% solids by volume) was assayed for plutonium-bearing solid compounds. After the solid phase was isolated by filtration, complete dissolution of the solids was effected by refluxing in a 16 M HNO_3 - 0.4 Mole % HF solution. Analysis of the resulting solution showed that ~60% of the plutonium present in the original sample was in the solid phase. Total plutonium values obtained on the sample agree within 15% (15% higher) of the original value obtained by the 234-5 Control Laboratory.

Controlled Potential Coulometry

Precision tests with the 222-S experimental controlled-potential coulometer using a 20 g/l plutonium chloride solution indicate that the instrument may

have application for the assay of Z-Plant final product materials. Under closely controlled conditions, a standard deviation (including pipetting variance) of 0.076% was obtained. As a result of this work and instrument design considerations, it is believed that with an instrument designed solely for this purpose even better precision can be obtained. As a consequence, the design of a high precision automatic coulometer for final product assay is currently being studied by the Hanford Laboratories Operation.

QUALITY CONTROL AND STANDARDS

During the month the Quality Control Program for the Chemical Processing Department Analytical Control Laboratories was maintained as usual. The Analytical Control Quality Report - July-September, 1958, HW-57794, was issued.

The Standards laboratory continued the production of calibrated glassware and standard solutions. Np standards were added to the Quality Control program. In addition, an SCF standard, plutonium nitrate, and U_3O_8 spectrographic standards have been prepared for the 234-5 Control Laboratory. The calibration and checking of geometry discs for the alpha counters was in good control at month end.

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234-5 DEVELOPMENT OPERATIONPreparation of Plutonium Trichloride

Chloride produced in recent batches has been darker in color than that previously observed. Laboratory analyses show this material to have a Cl/Pu ratio of 3.0. Visual comparison of batches chlorinated at 450 and 600 C indicates that the darker crystalline material results from the higher chlorination temperatures.

The Pyrex tube of the continuous chlorinator was lengthened, an additional furnace was installed, and the unit was moved into a "hot" hood. Operating attempts were directed at finding vibration intensities, powder feed rates, and tube slopes which result in good powder flow. At first, oxide overran the partially-chlorinated powder. To overcome this, the tube slope was reduced stepwise from 9° to 3°. Overrun ceased.

Plugging was experienced with a high powder flow and low vibration rate. Most of the cake was broken up by more intense vibration. Powder initially introduced was recycled. Analysis showed complete conversion to the trichloride.

Plutonium Trichloride Reduction

The darker high temperature chloride mentioned above was reduced according to the standard formula, but resulted in poor buttons and low yields. The reduction was improved by increasing the amount of booster.

A sample of incompletely-chlorinated material was reduced. Analysis indicated approximately 55 percent PuCl_3 and 45 percent PuOCl . A good button was obtained with 95 percent yield.

Two reductions were tried with mixtures of plutonium chloride and plutonium oxide. Only moderate success resulted. Evidently partially-chlorinated material or oxychloride is easier to reduce than a mixture of plutonium oxide and plutonium chloride.

Tests were completed to determine the amount of water that could be tolerated in a safe and efficient reduction. Small-scale (30-gram) reductions were made with known additions of water. Water additions were made both by physical addition and by absorption. Up to 0.6 percent water can be tolerated in the reduction step. Under this condition, a yield of 96 percent was obtained with 160 pounds of pressure. This result was confirmed in a 700-gram scale reduction. Higher concentrations of water result in considerably lower yields. The complete results of this work are described in the following table:

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TABLE I

REDUCTION OF PuCl_3
CONTAINING ADDED AMOUNTS OF WATER
(Thirty-gram Scale)

<u>Percent Water</u>	<u>Water Added Via</u>	<u>Maximum Bomb Pressure PSI</u>	<u>Firing Temperature C</u>	<u>Percent Recovery</u>
0.0		105	580	94
0.1	Pipet	110	530	---
0.2	Pipet	110	450	97
0.3	Pipet	135	560	97
0.5	Pipet	115	500	96
0.5	Absorption	130	570	95
0.6	Pipet	160	530	96
0.6	Absorption	160	610	50
0.6	Absorption	150	560	95*
0.6	Absorption	130	570	97**
0.7	Absorption	180	570	91
0.8	Absorption	160	590	78
0.9	Absorption	195	570	72
0.9	Absorption	170	560	77*

(*) Additional 20% calcium.

(**) On a 700-gram scale.

Task I Studies

The laboratory continuous Task I unit was operated to investigate items relating to the operation and performance of the calciner.

A small glass cyclone separator was installed in the calciner off-gas line to capture any entrained powder. It was found that the moisture in the off-gas condensed in the cyclone and normal functioning was, therefore, impossible. For future operation, the cyclone will be heated by means of an electrical heating tape in efforts to eliminate this condensation.

A test was made to determine what would happen if an excess of oxalate cake was suddenly charged to the calciner. After a period of normal operation, the calciner screw was turned off and oxalate cake allowed to build up in the calciner head end. The screw was then restarted and the output of the calciner collected in batches over known time intervals. The surge of material was not flattened significantly in passing through the calciner. At its peak, the surge was around 40 percent in excess of what is felt to be the normal capacity of the unit; but all of the powder was adequately calcined.

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Recovery of Plutonium From Slag and Crucible

Three runs have been made using the hydrolysis - precipitation flow sheet discussed last month.

Following the acid boil-off, the plutonium was found to be mainly in the plus six valence state, which required a valence adjustment to the four state. This was accomplished by the addition of hydrogen peroxide.

The pH necessary for complete precipitation of the plutonium ranges from 7 to 9 rather than 0 to 2 as first suspected. The pH is obtained by boiling off the acid to a low level; then adjusting the final pH by 0.2 M NH_4OH addition. Using this concentration, none of the calcium or magnesium precipitates.

With these adjustments, ten-fold or better volume reductions have been accomplished with this system, and 99+ percent of the plutonium was recovered in one treatment of the residue with a nitric - hydrofluoric dissolution.

"Precipitation Method For The Recovery Of Plutonium From Chloride Slag And Crucible," HW-58021, Confidential, is being issued, describing this recovery process.

Ceramic Development

Further tests were conducted to determine whether magnesium oxide liners could be impregnated with salts to result in a satisfactory crucible for chloride reductions.

An RS-4 magnesia crucible was satisfactorily impregnated with sodium chloride by heating the charged crucible right-side up in a resistance furnace to 150 C above the melting point of the salt (800 C), and holding for 15 to 30 minutes. The salt melts and climbs by capillarity to a satisfactory height.

The amount of salt charged was initially 100 grams, which was excessive. Next, 60 and then 40 grams were tried. Forty grams and 950 C for 30 minutes gave good results--the salt rising to within 1-1/2" of the top of the 9-1/2" crucible.

ORGANIZATION AND PERSONNEL

Personnel

No Change

Trips

K. M. Harmon, E. F. Kurtz and H. P. Maffei visited I. B. Venable, J. Pringle, E. J. Walko, W. Wright and H. C. Anderson of the Dow Chemical Co., Rocky Flats Plant, Denver, Colorado on October 7 to discuss and inspect plutonium purification and fabrication processes and facilities. They also visited W. J. Maraman, C. Metz and J. Lemon of Los Alamos Scientific Lab., Los Alamos, New Mexico on October 8 to discuss and inspect plutonium purification and fabrication processes and facilities.

B. F. Judson attended a technical consultation on SNAP Project at the Martin Company, Baltimore, Maryland on October 8 with T. R. DeBacker. He also attended a consultation on FP Market Survey at the A. D. Little Co., Boston, Mass. on October 22 and 23 with M. Michaelis.

R. S. Rosenfels presented a paper at the High-Temperature, Non-Metallic, Inorganic Material Symposium, Schenectady, New York on October 8 and 9. Contacts were made with J. A. Palm, Chairman, H. Schmidt and D. Lillie. He also visited F. B. Huke of the Norton Company, Worcester, Mass. and W. B. Seefeldt and J. H. Handwerk of the Argonne National Laboratory, Lemont, Illinois on October 10 and 13, respectively to discuss ceramic development.

R. E. Smith and A. E. Smith visited Fred Uffleman and Ernest Zurker of the Union Carbide Nuclear Company, Oak Ridge, Tennessee on October 14 and 15 to consult with Y-12 personnel on fabrication equipment; discuss uranium feed processing with personnel in K-25. They also visited J. W. Wilkie of the Pratt and Whitney Company, W. Hartford, Conn. on October 16 and 17 for consultation on 6-Coordinate Gage.

J. P. Duckworth and W. H. Swift visited F. L. Culler and Dr. Googen of the Oak Ridge National Laboratory on October 20, 21 and 22 to discuss separations processes. They also visited R. L. Folger and J. O. Morrison of E. I. du Pont de Nemours & Co., Savannah River Plant, Aiken, South Carolina on October 23 and 24 to discuss separations processes.

Visitors

C. J. Pinamont of the Dow Chemical Co., Rocky Flats Plant, Denver Colorado visited H. H. Hopkins, Jr. and H. W. Crocker on October 2 to discuss fluorination problems; visited R. E. Smith and H. P. Maffei on October 3 to discuss plutonium processing; visited E. R. Irish on October 3 to tour Purex Plant and Ion Exchange.

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Visitors (Continued)

C. C. Thomas, Jr. of Westinghouse Electric Company, Pittsburgh, Pa. visited G. C. Ober on September 30 to discuss In-Line Instrumentation.

George Fedorko and Jim Tompkins of Air Products, Inc., Allentown, Pa. visited V. R. Cooper, R. G. Geier, E. R. Irish, W. C. Schmidt and E. L. Dunkin on October 6, 7 and 8 to sample Purex off-gas and discuss off-gas project.

R. M. Forssell of the Atomic Energy Commission Office, Shipping Port, Pa. visited G. C. Oberg on October 10 to inspect Purex Plant.

H. L. Boppel and W. F. Aller of Sheffield Corporation, Dayton, Ohio visited A. E. Smith on October 3 to discuss tape controlled template grinder and rotary contour gage.

H. F. Soderling of the H. F. Soderling Co., Seattle, Wash. visited A. E. Smith on October 3 to discuss tape controlled template grinder and rotary contour gage.

W. C. Philoon and E. F. Sanders of Mallinckrodt Chemical Works, Uranium Division, St. Louis, Missouri visited M. J. Szulinski on October 15 to discuss trough calciners. They also visited W. H. Swift on October 15 to tour Purex Plant.

G. P. Lang and Norton Berry of Mallinckrodt Chemical Works, Weldon Spring, Missouri visited R. G. Geier on October 23 to discuss Dingot dissolution problems. Mr. Lang also visited M. K. Harmon on October 22 to discuss problems of Dingot metal dissolving and to tour the Redox plant; visited with M. J. Szulinski on October 23 to discuss trough calciners; visited with E. R. Irish on October 22 to tour Purex plant.

Milt Wahl of E. I. du Pont de Nemours, Savannah River Plant visited E. R. Irish on October 23 to discuss Palmolive program.

Frank Foley and Lloyd Gomez of Manufacturing Services Laboratory (GE), Schenectady, New York visited R. E. Smith and A. E. Smith on October 7 to discuss "Hands-Off" Program and development work.

Inventions

None

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V. R. Cooper
Manager
Research and Engineering

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HW-58031

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EMPLOYEE RELATIONS OPERATION
MONTHLY REPORT - OCTOBER 1958

I. RESPONSIBILITY

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

II. ACHIEVEMENT

FIRE PROTECTION OPERATION

There were two fire responses during the month. One was an accidental alarm and the other was an overheated ballast box in the ceiling light at 222-S building.

During the month, 285 fire extinguishers were inspected, 7 installed, 7 delivered to new location, 12 seals broken and not reported, 38 serviced, and 215 weighed. Twenty-five gas masks were inspected, and five serviced. Twenty hand lines were inspected. Sprinkler systems in 272-W, 272, E, 277-U, and 277-S were inspected and daily inspections were made of dry system in 2101 M building.

Various services were performed for other Operations. The Fire Protection Operation furnished standby for control burning at the C.R. tank farm on three successive days, and burned a building for Transportation Operation. A man from Redox was given evacuation bus driver training. Classes were held each Friday in Disaster Rescue work.

Since October was Fire Prevention Month, increased emphasis was placed on this subject. Approximately 450 people attended meetings where Fire Protection Operation personnel gave talks, showed films, gave fire extinguisher demonstrations and explained fire apparatus and equipment. Pamphlets were distributed to outgoing shifts on three different occasions at both 200 E and 200 W badge houses. Practice evacuations were held in eight different buildings. Fire prevention inspections were made of three different buildings.

A new tank truck was received during the month and tested. The pump on this truck did not come up to specifications and necessary changes will be made by the firm supplying the pumps for these trucks.

Fifty-six alarm boxes were tested during the month.

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EMPLOYEE COMPENSATION OPERATION

Studies of the proposed reorganization of one fourth level and two third level components are in various stages of completion. The "package" for one of the third level components has been submitted for management approval. Preliminary organization analysis has been completed for the other third level component. Position descriptions were reviewed and the organization analysis started for the fourth level component.

Goals and objectives for 1959 were completed.

Evaluations for seven positions were reviewed with no changes authorized.

Instruction letter and time-table for annual appraisals and salary review for 1959 were issued to third level managers. A salary review worksheet was developed and reproduced. Preparation of individual worksheets, salary distribution graphs, salary trend comparison charts and other useful data were well underway at month's end.

Eight jobs were reviewed and revaluated or other appropriate action taken during the month as follows: one secretarial for merit promotion, two semi-technical, five clerical-functional. Warranted promotional action was accomplished for the secretarial job; a new classification was established for one of the semi-technicals and action on the other is still pending; new classifications were established for four of the clerical functional jobs and action is still pending on the one remaining.

A conclusion was reached by all concerned in CPD that there had in fact been a merger of grade 10 and 12 Laboratory Assistant work; that for the most part the two kinds could not economically be separated; that the combination jobs and duties were essentially those which had existed for a long period of time classified as grade 12. As a result of the decision, the necessary papers were processed administratively to effect promotion of some 51 employees (most of the grade 10's) to grade 12 effective October 20, 1958.

In connection with the nonexempt compensation study, a proposed job description form was prepared for use as part of the proposed new nonexempt wage package.

Semi-technical work classification definitions prepared by J. J. Tegen were reviewed at Mr. Tegen's request to determine their validity, precision, and clarity as descriptions of levels of HAPO work for use in obtaining relative wage survey data information from other AEC installations. Comments were turned over to Mr. Tegen.

A preliminary study of extracted northwest area wage survey data was made to determine what use of the extracted information, if any, can be made by CPD at this time. Further study will be necessary to reach a conclusion on this matter.

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SUGGESTION PLAN

	<u>September</u>	<u>October</u>
Suggestions Received	59	40
Acknowledgements to Suggesters	59	40
Suggestions Pending Acknowledgement	0	0
Suggestions Referred to Operations for Investigation	59	40
Suggestions Pending Referral to Operations	0	0
Suggestions Completed and Closed	49	58
Adopted Suggestions Approved by Board	19	30
Adopted Suggestions Pending Approval by Board	31	19
Total Net Tangible Savings		\$5348.48
Cash Awards Paid During Month	\$155.00	\$ 625.00

As of the end of October, \$5055.00 have been paid in awards with a total of \$41,068.00 in net tangible savings. The average award of the 298 adopted suggestions is \$16.96 (below criteria of \$27.27) and the ratio of awards to savings is 12.3% (below criteria of 16.1%).

	<u>September</u>	<u>October</u>
Total number of suggestions outstanding to operations at end of the month	110	108

Participation in Benefit Plans

	<u>September</u>	<u>October</u>
Insurance Plan	99.8	99.8
Pension Plan	99.4	99.4
Stock Bonus Plan	60.9	60.0
Good Neighbor Fund	61.5	63.3

There was one employee death during October - W. S. Hoyle, W-4804, a Chemical Process Operator in Finished Products Operation on October 27. The next of kin was contacted on October 28 and all pertinent matters are progressing in a satisfactory manner.

HEALTH AND SAFETY OPERATION

<u>Chemical Processing Department</u>	<u>October</u>	<u>September</u>	<u>Year to Date</u>
Disabling Injuries	0	0	0
Serious Accidents	1	1	9
Medical Treatment Injuries	40	42	442
Overexposure Incidents	1	1	6
Potential Overexposure Incidents	1	0	5
Radiation Occurrences	41	33	269
Fires	0	3	18
Security Violations	0	0	9

Comments on Statistics

One case of localized skin exposure above the HAPD seven-day limit resulted from coverall contamination. One contaminated Medical Treatment Injury received special treatment by the Industrial Medical physician; classification is pending.

Programs

The Department's Safety Quiz program was completed on October 16. One out of three Chemical Processing Department people participated. Prizes were awarded to ten people. The program was publicized in the GE News.

Several CPD components made Fire Prevention displays, which served to create interest in the program.

A safety flyer on Fire Prevention Week was issued to all exempt personnel.

Eight safety messages were posted on the marquee boards.

Training and Education

An Accident Prevention Training session was conducted for 18 Purex personnel.

Advice and Counsel

Redox - Suggestion No. CP-1859 regarding purchase of test leads insulated on both ends for replacement of uninsulated leads; No. CP-1956 regarding bus loading lanes and passenger waiting lanes at 200-W Richland bound bus lanes; need for improved roadway control during burial of contaminated equipment by rail; recommendations for storage of chemicals and maintenance parts and equipment; program planning and procurement of individual prizes in connection with Million Man Hour Club.

Purex - Cask car standards - handling off-site materials; approved purchase of a portable breathing air compressor; approved suspended scaffolding for removal of steam valve in the service blower room; oxygen efficiency content was checked in pump and valve pits 2, 4, and 5; approved oil immersion electric heaters for installation in the 291-A steam turbine oil supply.

Finished
Products - Use of hydrogen and phosgene in new process; reviewed and approved comment prints of an incinerator facility for plutonium reclamation in Z Plant; recommendations for storage of material for reclamation; setting up a marking system for SWP welders flame proof clothing.

P & GM - Made final inspection of a remote crane control station for 277-W boiler shop; recommended procedures for welding on the UNH semi-trailer; advised the landlord to improve condition at 19th and Beloit Avenue.

Facilities
Engineering - Design of a paint storage building for Purex; safe requirements for sinking of caisson at 241-S Tank Farm; ventilation requirements for the new Purex oil and paint shop.

Employee
Relations - Communications on change of exposure working limits by IPD.

IPD - Assistance in meeting exposure goals by overtime program involving CPD and HLO radiation monitors.

HLO - Review outline of material on radiological working conditions to be presented to the Joint Committee on Atomic Energy.

General - Provided three safety graphs to Relations & Utilities Office Machine Operation.

Inspection, Investigation and Audit

Investigation of CPD Serious Accident 58-9, tipping of a 202-A PR can. Investigated arc burns to forehead of welder in Waste Handling and Decontamination Operation.

Inspection of 271-U Building.

Accompanied HOO-AEC personnel on an inspection of the 234-5 Building to check Project Proposal CG-789, additional fire protection for 234-5 Building. All components of Employee Relations were inspected with emphasis on Fire Prevention.

The inspection phase of the Power Operation audit was completed.

Audit of the Financial Operation is in progress.

Reports Issued

Accident Prevention Council Minutes

Serious Accident 58-9

Technical Overexposure Incident CPD 58-6

Potential Overexposure Incident CPD 58-5

Review of CPD Radiation Occurrences for August and September, 1958.

Monthly Health, Safety and Security Performance

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PERSONNEL DEVELOPMENT AND PLACEMENT

A. <u>Employment</u>	<u>Exempt</u>	<u>Non-Exempt</u>	<u>Total</u>
<u>Additions</u>	1	10	11
New Hires	0	0	0
Reactivates	0	3	3
Re-Hires	0	0	0
Transfers from other components	0	6	6
Non-Exempt to Exempt	1	0	1
Exempt to Non-Exempt	0	1	1
<u>Removals</u>	4	27	31
ROF	0	5	5
Illness	0	5	5
Leave of Absence	0	1	1
Retired	0	0	0
Transfer to other components	3	8	11
Resigned	0	7	7
Non-Exempt to Exempt	0	1	1
Exempt to Non-Exempt	1	0	1
<u>Requisitions (Non-Exempt)</u>			
Number on hand at beginning of month		6	
Number received during month		10	
Number filled		14	
Number on hand at close of month		2	
<u>Request for Transfer (Exempt)</u>			
Number on hand at beginning of month	13		
Number received during month	1		
Number transferred	0		
Number closed out	5		
Number on hand at close of month	9		
<u>Applications for Employment (Exempt)</u>			
Applications received during October	0		
Hired	0		
Closed out	0		
Applications on hand at close of month	0		
Open Requisitions	4		

Service Pins

A total of 12 pins were issued as follows:

10 yrs. service	8 Male	1 Female
5 yrs. service	3 Male	0 Female

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As the result of Redox going on a five day week 33 employees were declared as available for placement. All of these were placed within CPD and HAPO with the exception of nine Separation Utility Operators. Five of the nine operators accepted ROF's October 3rd while four voluntarily terminated in order to withdraw their pension money.

Referrals of six CPD technical personnel for promotional opportunities outside HAPO were made during the month.

Candidates for specialized opening in CPD were requested from the Manufacturing and Engineering Inventories.

Status - Personnel Development Program for Non-Exempt Employees

<u>Month</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>Total</u>
Number of appraisals scheduled	90	98	97	519
Number of appraisals delinquent 10-31-58	7	20	69	103

Correspondence

During October a total of 11 inquiries regarding CPD personnel were answered. They consisted of:

- 2 letters regarding record of employment
- 2 letters of inquiry regarding credit
- 7 letters regarding housing loans

Military Service Records

Records show that CPD has a total of 114 employees who are subject to military training through Selective Service or Armed Forces Reserve action.

	<u>Exempt</u>	<u>Non-Exempt</u>
Ready Reserve	11	13
Standby Reserve	16	4
Deferments Requested		5
Deferments Granted		0
Deferment Requests Pending		8

B. Personnel Training and Development

Participation in Training Courses

Exempt	102
Non-Exempt	121
G.E. Supervisory Selection Program - No. Completed	1
G.E. Supervisory Selection Program - No. Revaluated	2
Technical Graduates on Rotation	4
Employees counseled in self-development	3
OPG's Issued (1 new, 10 revised)	11

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Dr. Conant started two new groups in "Understanding People." The representatives of the Financial Operation are conducting the five session course "Introduction to Finance."

C. Office Services

Duplicating

Total Multilith Copies Produced	162,824
Ozomatic Copies Produced	12,699
Verifax Copies Produced	309
Xerox Copies Produced	605

Mail

Total Pieces of Mail Handled	73,690
Registered Deliveries	370
Library Mail, Pounds	424
Blue Prints, Pounds	323

Addressograph

Instrument Charts, Imprinted	8,477
Bulletins, OPG's, etc.	10,398

COMMUNICATION

Employee Communication

In addition to the normal items of information and safety promotion, CPD mass communications were used extensively during the month to communicate Good Neighbor Fund promotion (four Management News Bulletin items, two GE NEWS stories); economic education, including OPERATION UPTURN, (two GE NEWS stories, two Round Table articles); news of the atomic energy field (news briefs in two Headliners); and organizational changes (five Management News Bulletin items, one GE NEWS story, one priority message).

A comprehensive report on CPD's activities in connection with the OPERATION UPTURN campaign was compiled and sent to Relations & Utilities for inclusion in the HAPO report. Copies were also provided each member of the Department OPERATION UPTURN Council.

The Company's Employee Relations mailing list for CPD personnel was completely revised and re-submitted to the New York office.

A new publication was initiated during the month. It is a Union News Roundup and contains a digest of material from the New York office Union bulletins, as well as the news from various GE plant papers. At the present time a Roundup has been prepared on the average of twice a week. The Roundup is distributed to all Level 3 managers.

Public Communication

Arrangements were made for the Manager - Research & Engineering to write material on chemistry as a vocation for use in an advertisement to be run in the Pasco and Richland High School papers. This ad will be one of a series which will run each month during the 1958-59 school term.

Requests were received from five CPD authors for editing and clearance service.

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UNION RELATIONS OPERATION

A total of thirteen Step I grievances were received during October. Of this number eleven were jurisdictional in nature. Of five grievances scheduled at Step II, two were held over and it is anticipated that the Council will not bring them in again. All Step II grievances were jurisdictional in nature.

One non-unit grievance was processed at Step II during the month.

The Council formally notified the Company of the withdrawal at arbitration of the G. M. Brown grievance. (Transfer of an employee to the East Area shop when another employee had a bona fide request for the same location on file.)

The HAMTC has presented the Company with formal request to jointly seek appointment, by the Federal Mediation and Conciliation Service, of an arbitrator to hear the Wonacott grievance case. The Union found the latest Company effort to resolve differences in respective viewpoints unacceptable, and subsequently expressed the desire to proceed to arbitration at as early a date as possible. It would appear that a stalemate has been reached, the Company being unable to retreat from its position without being compelled to hire an additional monitor in order to meet the manpower demands imposed by the jurisdictional settlements between the Crafts and the Radiation Monitors.

An analysis of the Operation's data on union dues checkoff reveals that the percentage of bargaining unit people utilizing checkoff has increased from 60% in October 1956 to 72% by the end of September 1958, but had decreased to 65.6% by October of 1958. This increase occurred in the face of a force reduction of 295 people from 785 people in the bargaining unit during the period stated.

UNION RELATIONS OPERATION

	<u>October</u>	<u>September</u>
Bargaining Unit Employees in CPD	812	792
Bargaining Unit Employees Utilizing Check-off	533	565
Percentage of Total Bargaining Unit Employees Utilizing Check-off	65.6	72.1

Following is the grievance statistics summary for the month of October, 1958.

	<u>Unit</u>	<u>Nonunit</u>
Grievances received year to date	135	2
Grievances pending at Step II on 9-30-58	14	1
Grievances received during the month	13	0
Satisfactorily answered at Step I	3	0
Settled at Step I through expiration of 90 day time limit	1	0
Processed at Step II	6	0
Pending at Step II on 10-31-58	16	0
Pending at arbitration		
Active	3	0
Inactive	8	0

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III. ORGANIZATION AND PERSONNEL

A. Meetings

Personnel in the Employee Relations Operation attended over a hundred meetings during the month. In addition to Safety, Security, Round Table, and Information meetings, these included:

Meetings with counterparts in other departments

Meetings in connection with the new Savings and Security Program.

Step II Pre-grievance meetings and succeeding grievance meetings.

Industrial Relations Council

Arbitration Hearing

AEC meeting for discussion of Criticality Aspects of Project Proposal CG-789

Trimethoxyboroxine fire extinguisher demonstration

B. Personnel Activities

Fire Protection Operation held 99 inside classes and 58 outside drills in which 12,330 feet of hose and 623 feet of ladders were used. The percentage of time spent in training was 14.1, amounting to 847 hours.

The Specialist, Technical Personnel Placement recruited engineers and scientific personnel on the campuses of the University of Texas, Rice Institute, and Kansas State University during October.

The Specialist, Training, conducted a Chemical Processing Department historical development and progress training session for Fuels Preparation Department production and standards technician personnel. Thirty-five FPD personnel reported and seemed eager to learn something about the work in other HAPO departments.

G. O. Ager, Specialist, Safety and Fire Prevention, attended the National Safety Congress at Chicago Illinois and visited the General Electric Metallurgical Products Department Carbonyl Plant at Detroit, Michigan.

C. Safety and Security

There were no medical treatment injuries or security violations during the month in Employee Relations Operation.

D. Roberts
Manager, Employee Relations

END

**DATE
FILMED**

9 / 3 / 92