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CHEMICAL PROCESSING DEPARTMENT

MONTHLY REPORT

FOR
AUGUST, 1958

HW--57328-Del.

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By Authority of CL-PR-2

Robert M. Hox 4/23/92

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J. H. Wells 5/15/92

Compiled By
OPERATION MANAGERS

September 22, 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

J. H. Hox
by M. Walker
10-15-73

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

AUGUST, 1958

GENERAL SUMMARY

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PRODUCTION

Some delay was experienced in resuming normal processing at the Purex plant after completion of the special run for neptunium recovery. As a result, the output of plutonium from the separations plants was less than that forecasted and scheduled. At month end both separations plants were operating at scheduled rates.

Production of UO_3 met the August commitment. Shipments of UO_3 during August exceeded the schedule by 10 percent.

At the request of HOC AEC, shape fabrication was temporarily suspended on August 25, 1958 to permit the diversion of all available plutonium to a special program. As a result, the output of shapes remains slightly behind the year-to-date forecast. Deliveries of shapes conform with the ALOO Schedule, while the delivery of unfabricated plutonium exceeds the schedule.

ENGINEERING

A total of 370 grams of Neptunium-237 were recovered in the Purex Plant during August. The recovery was made from LWV when the neptunium could not be held in HA process stream. Neptunium oxide was produced from the special processing run, the oxalate precipitation and calcination yielding 282 grams as neptunium.

At regular plant start up after neptunium recovery, the gamma activity was high and the product streams were slower in reaching specification. Auxiliary treatment of product successfully brought this material within limits.

Small fragments of irradiated polyethylene collecting in the Purex LBXF pump, near month-end, indicated partial disintegration of the HA column cartridge. By screening this material from the pump suction plant, operations were maintained while a replacement cartridge is being assembled in the shops.

The Prototype Silver Reactor installed in Redox Plant A-cell this month appears promising. It has significantly increased packing volume and depth, it indicates efficiencies above 99 percent and incorporates new operative flexibility.

Waste tank 113-SX continued to exhibit bottom movement. Sixteen days after emptying, the bottom again started to rise, reaching 40 inches above normal within the next 15 days. This movement raised the sluice pump and caused it to become inoperable. Further inspection of this tank is delayed until this pump can be replaced and sluicing can be done.

Semi-continuous solvent washing in Recuplex was initiated, permitting essentially plutonium-free solvent feed to the columns.

Development of the chloride process for plutonium reduction shows progress. High purity metal was obtained from 700 gram and 1400 gram scale reductions. Hydration

studies show satisfactory stability at 8 percent relative humidity and preliminary work indicates that nitric acid - hydrofluoric acid treatment of chloride slag and crucibles will produce suitable feed for solvent recovery of plutonium.

Process Design calculations covering the Case III equipment needed for isotopic separation of xenon have been completed. Plant and equipment layout drawings are being prepared to obtain cost estimates.

Beneficial use of the facilities provided by CG-766, Additional Ventilation for Purex P & O Gallery, was attained August 15, 1958. Work is complete except for painting of the exterior ductwork.

A rough draft of the design scope document on additional RMC fabrication line facilities was issued during the month. This rough draft was accompanied by approximately 30 drawings prepared for use in the design scope and for cost estimating purposes.

All design work on the degreasing and briquetting hood was completed during the month and all drawings were approved.

Process design drawings of the facilities for the recovery of plutonium from miscellaneous 234-5 Building wastes have been completed. The drawings and a draft of a report have been issued for comments.

A modified laundry tumbler installed in E-cell of the 224-U Building for cleaning used filter bags was tested. Two bags from the X-28 filter were cleaned by tumbling and approximately 95 percent of the powder adhering to the bags was recovered.

GENERAL

A revised target budget was discussed with Level 3 managers and consolidated for circulation to the CPD General Manager for review.

Although a number of changes have complicated budget preparation in the last several months, work is progressing on schedule. Items resulting in budget revision and changes are as follows:

1. Downward adjustments to coincide with HAPO General Manager and Commission reductions (Revised FY 1959 Budget).
2. Change in accounting procedures to implement more complete responsibility accounting.
3. Reorganization of Power and General Maintenance.
4. Changes in methods of liquidating Redox, Purex, and Finished Products internal costs (for the purposes of simplification).
5. Alter each of the budgets to provide for fabrication shutdown.
6. Anticipated reorganization within Finished Products.

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7. Provision for neptunium recovery budget.

The unions have shown renewed interest in assignment of work to Minor Construction forces. A list of jobs so performed was presented to the Company with a request for explanation as to why the work was so assigned. Investigation disclosed that the work was assigned in some cases by Commission directives; in others because insufficient manpower or budgetary considerations controlled.

STAFF

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

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CHEMICAL PROCESSING DEPARTMENT
NUMBER OF EMPLOYEES
AUGUST 31, 1958

<u>OPERATION</u>	<u>EXEMPT</u>		<u>OTHER</u>		<u>TOTAL</u>	
	<u>7-31-58</u>	<u>8-31-58</u>	<u>7-31-58</u>	<u>8-31-58</u>	<u>7-31-58</u>	<u>8-31-58</u>
GENERAL MANAGER'S GROUP	10	10	1	1	11	11
PRODUCTION	7	7	3	3	10	10
PUREX	51	51	216	215	267	266
REDOX	62	62	263	265	325	327
FINISHED PRODUCTS	58	58	256	254	314	312
POWER AND GENERAL MAINTENANCE	41	38	226	223	267	261
FINANCIAL	21	21	44	41	65	62
FACILITIES ENGINEERING	72	72	23	23	95	95
RESEARCH AND ENGINEERING	63	63	23	22	86	85
EMPLOYEE RELATIONS	<u>30</u>	<u>30</u>	<u>54</u>	<u>52</u>	<u>84</u>	<u>82</u>
	415	412	1109	1099	1524	1511

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DECLASSIFIEDCHEMICAL PROCESSING DEPARTMENTPATENT SUMMARY
FOR
MONTH OF AUGUST, 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

G. A. Conner

TITLE

A Remotely-Opened Welding-Hood
Viewing Window Device (three
alternate methods were submitted)

ACTING GENERAL MANAGER
CHEMICAL PROCESSING DEPARTMENT

CHEMICAL PROCESSING DEPARTMENT
PRODUCTION OPERATION

AUGUST, 1958

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I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Production Statistics

1. Purex Operation

	<u>August</u>	<u>July</u>
Tons uranium processed	196.72	521.18
Average production rate during operation (T/D)	17.9	17.8
Total waste loss (%)		
Uranium	0.13	0.05
Plutonium	0.56	0.16
Average cooling time (days)	105	108
Minimum cooling time (days)	92	93
On-line efficiency (%)	52.0*	93.7

2. Redox Operation

	<u>August</u>	<u>July</u>
Tons uranium processed	138.7	220.4
Average production rate during operation (T/D)	9.0	9.3
Total waste loss (%)		
Uranium	0.14	0.16
Plutonium	0.32	0.31
Average cooling time (days)	106	108
Minimum cooling time (days)	97	95
On-line efficiency (%)	49.7	76.8

3. 234-5 Operation

	<u>August</u>	<u>July</u>
Batches input to Task I	255	313
Runs completed through Task III	174	181

Waste disposal (units)	522.32	670.01
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*Pu 36%
Np 16%

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4. UO₃ Operation

	<u>August</u>	<u>July</u>	<u>To Date</u>
UO ₃ loaded (tons)	543.9	491.86	
UO ₃ approved for shipment (tons)	558.96	456.86	28,663.10
UO ₃ shipped (tons)	458.43	506.88	28,443.39
UO ₃ backlog (tons)	142	308	

5. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped (gpm)	6,700	4,880
Filtered water pumped (gpm)	753	1,068
Maximum steam generated (lbs/hr)	194,000	85,000
Average steam generated (lbs/hr)	95,240	63,860
Total steam generated (M lbs)	70,863	46,517
Coal consumed, est. (tons)	4,220	3,074

6. Waste Storage

	<u>August</u>	<u>July</u>
Salt waste reserve storage capacity - Redox	2,062	2,200
Salt waste reserve storage capacity - Purex	13,180	13,370
Coating waste reserve storage capacity-Redox	40,100	40,238
Coating waste reserve storage capacity-Purex	41,721	41,911

As a result of recent experiences in variance between book inventories and actual physical inventories of SS materials, efforts have been intensified in the field of SS materials control. Controlled processing in Redox plant has been scheduled during September in order to make a comparison of uranium measurements through the plant and to evaluate plutonium yield calculations. The efforts of CPD and SS Accountability Operations have been integrated in studies in all the plants to strengthen the SS materials control by the use of current data obtained from the SS Accountability books. The present methods of establishing statistical control limits for SS materials are being carefully scrutinized in an attempt to provide more realistic limits. Of particular interest in this field is the factoring in of actual experience in the establishing of the control limits.

B. Production Planning and Scheduling

During July 101,000 gallons of self-concentration were realized at A-Farm as compared to 254,000 gallons of waste received. Temperature and liquid levels were controlled by adding 700,000 gallons of water to the three boiling tanks, bringing total water addition since February 1957 up to 6,225,000 gallons. Self-concentration in A-Farm, since inception during July 1956, increased to 5,190,000 gallons (76.0%) of total Purex waste stored in A-Farm) as compared to 5,653,000 gallons (40.9%) reclaimed at SX-Farm where self-concentration started in November, 1954. Water additions to SA tanks total 733,000 gallons to date.

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Pre-heating of the 104-A Tank was started by adding approximately 35,000 gallons of waste on top of 144,000 gallons of water using a recirculating pump to agitate the liquid and thus provide more uniform distribution of the heat, the tank will remain static for several months, at which time the procedure will be repeated. By gradually raising the temperature to boiling over a period of approximately six months, it is the opinion that the tank integrity will not be jeopardized by thermal shock when subjected to routine use, possibly in early 1959.

After completing the transfer of waste in 113-SX, the soil was excavated to the encasement. A hole was then drilled through the encasement to permit swabbing. Negative monitoring results indicated no leak at this point. During the week ending August 17, there were indications that the tank bottom bulged again to a height of approximately one foot. Liquid and/or sludge content of the tank was less than 5,000 gallons. Current plans are to install a periscope and inspect the tank interior before taking further action.

The shipping cask flushing program has been approved and preparations are being made to make the necessary cask and cask lid alterations. Work on the casks is being planned to provide the minimum interference with shipping schedules.

C. Finished Products and Customer Liaison

The Fission Products Market Survey continued as scheduled. On August 20th, a progress meeting was held in Washington, D.C. with Arthur D. Little, Inc. people. The bulk of the field interviews, covering some 125 respondents have been completed, however, a few spot checks will be made to clarify and complete the findings. Information obtained indicates no commercial market in the immediate future. There will be no information concerning the military market until after November 1, 1958, the date set by the DOD people for returns of their survey from their various agencies. Indications are still that the military or classified uses are the only present potential market for fission products.

A meeting sponsored by the AEC/OID for all groups interested in OID sponsored programs (Arthur D. Little, Inc./CEM group, Radiation Application, Inc. Brookhaven National Laboratories, W. B. Johnson, Associates) was attended. The OID's overall program is for the promotion of the use of radiation, based on the facts gathered in the various surveys, including ours. The OID has funds available for programs in FY 59 and 60 to further their promotional programs.

D. Essential Materials

A warehouse study for storage of dry essential materials was completed. Preliminary indications are that the most economical method is to have warehouses for the individual plants constructed to eliminate the double-handling of dry chemicals.

In addition to the essential materials storage requirements, the economics of new warehouses for all CPD materials is being studied. Expenses saved by eliminating double-handling must be compared to the costs incurred by building new warehouses and constructing new railroad spurs.

The study was performed with the different assumptions (1) sodium nitrate would be purchased as dry material in 100 pound (net) paper bags, and (2) sodium nitrate would be purchased as a solution and shipped via tank trucks.

Early in the month a meeting was attended by the General Chemical personnel at Hedges, General Chemical Sales Manager from Seattle, our GE Purchasing Agent for essential materials and representatives from CPD. The feasibility of General Chemical making liquid sodium nitrate from nitric acid and caustic soda was explored. A sample was prepared at Hedges and submitted for analyses; the only unfavorable item was a slightly high percentage of sodium chloride compared to our present dry sodium nitrate. However, it appears that this high sodium chloride content (0.4% in a 41% solution of sodium nitrate) will not preclude accepting the material if the price is right. It is expected that General Chemical will forward price quotations shortly.

A study was conducted to provide information concerning shipping special fuel elements to ORNL for subsequent Cerium recovery. Freight rates, available shipping casks and capacity, and Cerium content of the fuel elements were determined. It appears more feasible to ship special fuel elements from SRP to ORNL instead of HAPO to ORNL because of lower freight rates and the reduction in time required for round trips of casks.

E. Reports and Documents

1. Prepared and Issued

HW-56955 RD Redox Plant Production Schedule, August, 1958
D. McDonald

HW-56956 RD Purex Plant Production Schedule, August, 1958
D. McDonald

HW-56957 RD UO₃ Plant Production Schedule, August, 1958
D. McDonald

HW-56958 RD 234-5 Plant Production Schedule, August, 1958
D. McDonald

HW-56971 RD Second and Third Quarters Fiscal Year 1959 Forecast of Nuclear Materials Requirements Chemical Processing Department, H. F. Tew

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- HW-56983 Scheduled Shutdown - Redox and Purex Plants
V. R. Chapman
- HW-57071 Fission Product Supply for the ORNL Fission Product
Pilot Plant, V. R. Chapman
- HW-57085 Essential Materials Consumption-Purex - Chemical
Processing Department for July, 1958, M. A. Thress
- HW-57114 Essential Material Area Report to Cost and Purchasing -
Production Operation - Chemical Processing Department
for July, 1958, M. A. Thress
- HW-57122 Chemical Processing Department - Waste Status Summary
for July, 1958, R. E. Roberts
- HW-57131 Chemical Processing Department Daily Production Reports
April 1, 1958 Through June 30, 1958, H. F. Tew

2. Prepared for Signature and Issuance

- HW-56984 HAPO Fabrication Schedules, W. E. Johnson
- HW-56970 Production, July, 1958, W. E. Johnson
- HW-57201 Neptunium Recovery, J. H. Warren

III. ORGANIZATION AND PERSONNEL

A. Force Summary

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

B. Safety

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

C. Security

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

D. Visits

On August 20 and 21, 1958, R. E. Tomlinson visited AEC Division of Production, Washington, D.C. to discuss transportation of non-production fuels and general problems related to Hanford production.

R. E. Tomlinson
Acting Manager
Production Operation

CHEMICAL PROCESSING DEPARTMENT
PUREX OPERATION

August, 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	49.2 Percent
Plutonium	44.9 Percent

b. Production Rates

7-18-58 at 1500 to 8-3-58 at 1000	2.16 CF
8-3-58 at 1000 to 8-8-58 at 1700	Shutdown in preparation for Np recovery, plus maintenance work.
8-8-58 at 1700 to 8-13-58 at 2400	Np processing runs.
8-13-58 at 2400 to 8-21-58 at 0300	Down for tube bundle change, XAF pump difficulty and cleamp of solvent following the Np run.
8-21-58 at 0300 to 8-27-58 at 0400	2.16 CF
8-27-58 at 0400 to 8-29-58 at 1345	Down while unplugging the IBXF line.
8-29-58 at 1345 to 8-30-58 at 0030	2.16 CF
8-30-58 at 0030 to 8-31-58 at 2400	2.40 CF

c. Operating Continuity

Plutonium	36 Percent
Neptunium	16 Percent

d. Waste Losses

Uranium	0.13 Percent
Plutonium	0.56 Percent

e. Product Re-treated in Silica Gel	234 Tons
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2. Normal Processing

Due to the leak in the disengagement section of the HS column, as reported last month, the HS column was bypassed all month with the HAP stream routed directly to J3. This flowsheet was employed successfully during the previous three months of this year.

During regular production periods the neptunium tends to collect in the JWB system, however, on 8-1-58 the neptunium unexpectedly dropped out in the HAW stream. The waste bearing neptunium solutions were segregated and concentrated to approximately 6800 gallons and eventually processed as a master run for neptunium recovery. (See Special Processing).

The plant startup following the neptunium recovery operation was marked by high gamma activities throughout the entire system, partly as a result of processing high activity neptunium bearing waste solutions and partly as a result of a foam-over in the F8 rework tank just prior to shutdown on 8-3-58. The plutonium product solutions were within specifications two days after startup, although the uranium product exceeded gamma specifications (before silica-gel treatment) until after five days of operation. During the same period 2BW losses increased temporarily to 1.6 percent as a result of improper ratio of aqueous to organic in 2B column. This condition was brought about by a malfunction of the 2AS rotameter, coupled with an incorrect calibration of a new 2BP control valve which was installed for the neptunium recovery run. Approximately 130 units of plutonium in the 2OW were segregated for future rework.

On 8-27-58 it was necessary to suspend processing due to insufficient IBXF flow. The difficulty was traced to partial plugging of the IBXF valve with fragments of polyethylene which presumably came from the HA or HS column cartridge. Before the nature of the problem was known the IBXF pump and DOV assemblies were replaced. As a means of correcting this condition a screen was installed on the IBXF pump inlet, however, minor difficulties with plugging continued during the period, which forced temporary reductions in processing rates.

Waste losses were higher than normal during August due to limited amount of regular production and the special neptunium recovery runs.

Dissolving rates were maintained in the two available dissolvers sufficient to sustain an 18 T/D production rate.

Self-concentration in tanks 241-A 101, 102, and 103 continued at rates of 5, 7, and 2 gallons per minute, respectively.

3. Special Processing

The IWW solution, which contained the neptunium loss to the HAW in mid-July and stored in F-8, was reworked during the first three days of the month.

Between August 1 and 3 the neptunium which had been accumulating in the 3WB during regular processing operations started to follow the HAW as it had done in mid-July. It became necessary to segregate this material and process it as a master neptunium run. The recovery of neptunium from the high activity waste associated with 130 tons of metal was more difficult than the originally planned recovery from the 3WB system, and necessitated widespread changes in the processing plans. Adequate decontamination was achieved by repeated recycling of the 2BP back to 2AF stream via special jumpers until the desired neptunium decontamination was achieved. The material was then routed to L Cell package, concentrated and loaded into PR cans. The operation was very successful as evidenced by the amount of neptunium recovered.

Following the neptunium recovery operation it was necessary to wash both organic systems thoroughly, since the gamma activity had increased by 5- to 10-fold. Five thousand gallons of organic solvent from the No. 2 system was transferred to the No. 1 system and replaced with fresh material. This dilution aided in dropping the activity of both streams to acceptable values.

Several product bearing waste streams were combined following the neptunium run, concentrated in F-11 and transferred to F-8 for future rework. In all, approximately three kilograms of plutonium and 2,000 pounds of uranium were collected.

B. Radiation Experience

The total emission of iodine 131 from the 291-A stack during August was 4.86 curies. The maximum emission in a seven-day period was 1.64 curies for the period ending August 27.

Four Radiation Occurrences were incurred during the month, two in Analytical Control Operation and one each in Maintenance and Processing Operations. Eleven cases of skin contamination were incurred with maximum levels 40,000 d/m plutonium and 3,000 c/m fission products.

Miscellaneous failed contaminated canyon cell equipment was loaded into a burial box and buried. The maximum radiation level on the loaded box was 6 r/hr at three feet. The maximum dose rate incurred during the burial operation was 5 r/hr while attaching the pulling cable to the box.

Surveys of the canyon deck following the burial job revealed an area over F Cell which read 20 rad/hr at 6 feet and a spot over A Cell reading 20 rad/hr at ten feet. Prompt decontamination efforts reduced the contamination level at F Cell to 15 mr/hr at four inches, and the spot at A Cell to 20 rads/hr at one foot.

A screen was installed on the J3 pump inlet to prevent plugging of the downstream process lines. The maximum radiation level measured was 20 rads/hr at eight inches. The maximum dose rate to install the screen remotely was 300 mr/hr at eight feet.

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The PR room was grossly contaminated when the L-11 sump overflowed, contaminating the floor area in the vicinity of L-11 hood in excess of six million d/m. A leaking instrument line above the L-10 sample hood contaminated the exterior of the sample hood and wall to two million d/m. Extensive and thorough decontamination and repainting of the area has restored the PR room to better than pre-spread status.

Process sampling for neptunium recovery resulted in increased exposure for both analytical laboratory and process sampling personnel. Although exposure rates for neptunium analyses were 10-fold higher than for normal process samples, improvements in shielding, equipment, and techniques reduced the exposure rates to about twice normal levels.

C. Mechanical Performance

During the month, two N Cell pulsafeder pumps were modified to increase the capacity of the units. Modification consisted of installing larger discharge heads on the XAS and spare (former XCS) pumps, thereby increasing the capacity from 4.68 gph to 18.8 gph.

During a normal inspection, an above normal temperature was noted on the bearing of No. 3 supply fan motor. Subsequent dismantling revealed a potential bearing failure attributed to normal wear and bearing fatigue. This is the first failure in this position since startup.

Two concentrator tube bundles were replaced during the month due to leaking tubes. The two recent failures are the third and fourth since plant startup. There is no discernible failure pattern and that performance was considered excellent in this particular location.

The mild steel No. 107 tank, which is used for sodium nitrate makeup and which failed during the previous month due to extensive cracking around the tank periphery, was replaced during the month. Failure was attributed to caustic embrittlement. A stainless steel tank, excessed from U Plant, was modified and installed as a replacement.

The IBXF feed pump was replaced with a spare unit on 8-29-58 after being in service since plant startup. The new pump was fitted with a 15" diameter x 18" long suction screen attached to the bottom section of the pump.

The IBXF controlling DOV jumper was replaced with a new jumper after experiencing considerable difficulty in maintaining desired flow rates.

The installation of the scrubber equipment for absorption of ammonia during the dissolving operation was completed in A Cell. The absorbed ammonia drains by gravity to the 216-A2 stack catch tank. The small physical dimensions of the catch tank, coupled with water flow to the scrubbers and the material received from the stack and backup facility make it mandatory that the automatic jetout facilities be installed before the ammonia scrubbers are used extensively. It is possible for the overflow water from the catch tank to back up into the 291-A dry filters in the building ventilation system. The automatic jetout controls can be installed during normal operation without affecting production rates.

The installation of the new 19,000 cfm exhaust fan tiein to the white room was completed by Construction on 8-13-58. The operation of the fan has been satisfactory, however, with the new fan in operation it was necessary to shut down exhaust fan EF-3-5 and seal the openings to the EF-3-3 and EF-3-4 fans so as to increase the pressure in the white room to 0.07 inches water. Further balance work will be carried out in the near future.

Installation of a 15,000 gallon stainless steel tank in the 203-A area for storage of UO_3 recovered acid is in progress. The new tank will be used in conjunction with the two existing 7,000 gallon tanks.

Three jumper failures occurred during the month. The E-2 centrifuge diverter valve developed a defective seal in the DOV. After the leak was verified, using a smoke bomb, a replacement unit was procured and installed. In addition one defective jet assembly and one steam jumper were replaced. High radiation fields precluded further maintenance work.

D. Analytical Experience

Analytical support for the neptunium recovery program involved numerous changes of methods for proper control. Even with the large number of samples received and the abnormally high radiation levels involved, the analytical work was carried out satisfactorily without holdup of the process and without radiation exposure or incident.

The laboratory is now in a position to analyze all Essential Materials utilized by the Purex Operation, plus some materials used by the power house in 200 East Area.

The new reactor effluent sample schedule has been in operation for one month and is working well. A total of 25 routine effluent samples were received and analyzed instead of the 16 originally scheduled. Since the new schedule requires use of a pulse height analyzer, the laboratory will continue to use available 300 area instrument time pending the receipt of new instrumentation which was ordered for the Purex laboratory.

E. Improvement Experience

1. Process Tests and Revisions

During the neptunium recovery runs, the 2A and 2B columns were operated at rates never before achieved. The 2A approached a 4.25 CF while 2B was close to a 7.0 CF.

2. Equipment Changes

Several changes were made in N Cell and the PR room to provide improved equipment performance:

- a. A routing was provided for the delivery of XCX solution from the AMU area to N Cell. By using larger makeup vessels the

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two makeups per shift previously required when using the small N Cell tanks were eliminated.

- b. The N-5 conductivity push probe was replaced with a capacitance type probe which has proved to be more reliable.
- c. The L-13 loadout line was replaced with a plastic line and two Jamesbury valves to alleviate the plugging which was frequently occurring in the diaphragm valves.

A prototype densitometer jumper was installed in the HA column for controlling the specific gravity of the organic at the top of the extraction section. Performance of the instrument has not as yet been established.

E. Inventions and Discoveries

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

F. Events Influencing Costs

Low production output and high maintenance cost adversely affected unit costs for the month. The damaged A Cell heater was returned to service following extensive decontamination and repairs. The reclamation of this equipment resulted in a saving of approximately \$24,000 in capital costs.

III. ORGANIZATION AND PERSONNEL

A. Safety

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

B. Security

No security violations were reported.

C. Personnel Activities

R. E. Dahl, Chemist, who had been on loan to Purex from Redox, returned to the Redox laboratory on August 18.

J. Mishima attended a seminar on alpha pulse height analysis in the 300 Area.

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

S. D. Smolen
Acting Manager
Purex Operation

SG Smolen:EAF:gt

CHEMICAL PROCESSING DEPARTMENT
REDOX OPERATION

AUGUST, 1958

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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 in the Redox Plant were conducted on a simulated five-day week schedule during August to demonstrate the feasibility of this type operation. Processing to date has been encouraging and no significant processing problems have been encountered. Waste losses have been very satisfactory and the quality of product has not been noticeably affected, although gamma ratios on the product streams have risen slightly due to internal flow sheet manipulations.

The monthly production commitment was achieved on 8-25-58. Processing operations were shutdown as of this date and a complete building cleanout started in preparation for a controlled accountability run during September. However, before the cleanout was completed changes in production commitments necessitated that the building be prepared for full production. This was done as rapidly as possible and at 0250 on 8-29-58 operations were resumed at 80% of nominal rate. By month end the rate was increased to 100%.

The monthly production commitment was exceeded by 10% while operating at 50% of the total hours in the month. The mechanical efficiency for the period was 88%.

Product waste losses for the month were very good, averaging 0.14% and 0.32% for uranium and plutonium respectively. All uranium and plutonium produced during the month was within shipping specifications; however, 15 batches of UNH with excessive gamma activity required ozonation and/or silica gel treatment to meet shipping specifications.

Iodine-131 emission to the 291-S stack averaged 0.47 curies per day with nearly all of this amount being discharged through the sand filter. Analysis of the individual streams routed to the sand filter revealed the major portion of the radioiodine to be entering the sand filter via the air vent header which serves the metal solution tanks.

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The use of mercury in the metal solution, following dissolution, to suppress iodine evolution through the air-vent headers is to be evaluated during the coming months. Significant iodine-131 emissions totaling 1.4 and 4.1 curies were observed during the periods 8-9-58 to 8-11-58 and 8-15-58 to 8-18-58, respectively. On both occasions processing operations had been shutdown for the week-end.

2. Equipment Experience

A new prototype silver reactor tower and heater was installed on the A-2 dissolver on 8-5-58 following a partial failure of the off-gas heater. The new prototype unit has a total packed volume of approximately 50 cubic feet and a packing depth of eleven feet as compared to 23 cubic feet and 7.7 feet for the standard silver reactor. The new unit also provides for by-passing the silver reactor during the coating removal operation, a provision which was not possible with the old reactor. Limited testing of the prototype system has revealed no evidence of iodine emission during coating removal and at least a 99.3% efficiency during metal dissolving. A more extensive evaluation of the reactor efficiency is to be carried out during the coming months.

B. Maintenance Operation

Canyon equipment replacement during August was the highest to date for CY 1958. However, equipment performance was comparatively good considering the frequent startups and shutdowns that were made to simulate the five-day week processing schedule. The following canyon equipment replacements were made during the month:

<u>Equipment Piece</u>	<u>Date</u>	<u>Reason</u>	<u>Length of Service</u>
H-4 Oxidizer Tube Bundle	8-16	Leak - presumably from corrosion	6 months
H-8 Metal Solution Agitator	8-17	Seized shaft	19 months
F-7 Feed Tank Pump	8-17	Seal leak	6 months
F-8 Feed Tank Pump	8-20	Seized shaft	16 months
E-5 Caustic Recirculation Pump	8-26	Leaking discharge jumper	3 months

Twenty-one canyon jumper installations were also made during the month. Twelve of these were in connection with the new prototype silver reactor tower and heater, two were for additional controls to improve operating performance, and seven were replaced as a result of failures.

On 8-22-58 a leak was detected in the coil of the A-2 dissolver. Subsequent investigation has revealed the leak to be of such magnitude that replacement is necessary. The change out will be made during the first week of September.

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C. Waste Handling and Decontamination Operation

1. Waste Handling

Redox Coating Waste Received (S Farm)	24,750 Gallons
Redox Salt Waste Received (SX Farm)	136,488 "
Total Gallons Boil-Off Salt Waste	217,821 "
Waste Received at TX (From 221-U)	None

The investigation for possible causes which may have resulted in the buckling of the tank bottom on the 113-SX salt waste storage tank (May, 1958) was continued this month. Excavation of the fill line at the tank revealed that the line was in good repair and no traces of moisture or radiation, that would normally be expected to accompany a leak, were found. Further investigation of the tank bottom distortion will depend upon the successful installation and use of a periscope in the 113-SX tank.

The salt waste stream from the Redox Plant was diverted from the 114-SX to the 115-SX tank this month. For temperature control purposes two feet of water was introduced into the 115-SX tank prior to receiving the salt waste.

2. Equipment Decontamination and Repair

a. Regulated Steam Pit

A total of nine vehicles, four pieces of heavy equipment, and four miscellaneous items were decontaminated during the month. A total of 108 manhours was charged to this operation.

b. Railroad Equipment

A total of 331 manhours was charged to this operation. The work included the decontamination and installation of flushing assemblies on three cask lids, repair of jet-out lines on car No. 98, and repair of three casks on car No. 44.

c. 221-U Canyon

One hundred forty two buckets of dummy slugs, used in the 100 Area reactors, were decontaminated and returned to the customer. A new sorting vat, which was fabricated and installed this month, has aided materially in expediting this work.

One Redox E-5 caustic recirculation pump was successfully decontaminated, disassembled, and at month end was in the process of being repaired.

Preliminary decontamination work on the Purex Plant's F-10 pump was completed and the motor removed prior to final decontamination work. Exposure dose rate for the motor removal was 600 mr/hr at surface as compared to off-scale CP readings at 30 feet prior to decontamination.

One pump valued at approximately \$30,000 was received from the Irradiation Processing Department this month for decontamination. The pump was shipped to the Redox Waste Handling and Decontamination Facility because IPD has no facilities large enough for decontamination of this unit.

D. Analytical Control

Considerable analytical support on an around the clock basis was given to the Chemical Research and Development Group of the Hanford Laboratories Operation in their recovery, purification, and concentration runs on the neptunium containing material processed through the Purex Plant. This work was done with anion exchange columns located in the multi curie section of the 222-S Building.

E. Radiation Monitoring Operation

Six radiation occurrences were reported in the Redox Operation during the month. Two of the radiation occurrences involved skin contamination and three were the result of employees exceeding authorized estimated exposure limits. One radiation occurrence resulted in a technical localized over-exposure when a contaminated glove in a pickup truck was not promptly detected by the driver. Appropriate corrective action has been taken to avoid similar occurrences in the future.

Personnel dose rates to accomplish canyon crane maintenance remained unchanged from July. Dose rates to 1500 mrad/hr at six inches were encountered during repair to the right hand auxiliary travel and 150 mrad/hr was encountered to inspect the brushes to the motor generator set in the cubicle. Effective shielding on the left hand impact wrench resulted in personnel dose rates of 2000 mrad/hr including 500 mr/hr at eight inches to replace the socket. Prior to shielding, the dose rates encountered were 6000 mrad/hr including 1000 mr/hr at three feet.

A dose rate of 10 r/hr at two inches was measured on the 113-SX salt waste tank fill line encasement during an investigation of contamination levels within the encasement. However, effective shielding in the work area resulted in personnel dose rates of 250 to 2500 mr/hr at one foot to accomplish the work.

Air contamination levels of 2.9×10^{-6} mcfp/cc were measured in the Redox Canyon during the replacement of the H-4 oxidizer tube bundle. However, no significant increase of contamination was measured in the Redox crane after completion of the extensive H cell work.

F. Improvement Experience

1. Process Tests and Revisions

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

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2. Inventions or Discoveries

There were no inventions or discoveries of a patentable nature reported in the Redox Operation during the month of August, 1958.

G. Events Influencing Costs

Spare equipment reductions during August amounted to \$42,300. The total decrease for CY 1958 now amounts to \$101,416. Spare parts reductions during August amounted to \$3,991. The total decrease for CY 1958 now amounts to \$21,055.

Improved backcycle operation has resulted in substantial flowsheet reductions in aluminum nitrate, sodium hydroxide, and ferrous ammonium sulfate. Even with the recent rise in the price of chemicals, the reduced consumption gives a net reduction in cost of standard flowsheet of \$12/ton on material processed.

Improvements have also been made in the technique of conducting the Type I shutdown, flush (10%) and startup procedures. Progress in this area has reduced costs about \$97 for these operations during the last quarter. The Type I sequence can now be performed for a total cost of \$360 as compared to \$1,160 a year ago.

H. Plant Development and Expansion

1. Preparatory Engineering

Inconcrete Piping

The use of fluoroflex as a liner for canyon inconcrete piping was successfully demonstrated simulating canyon conditions. Preparations are now being made for an actual installation in the 202-S Canyon.

CAC-812, Equipment Decontamination Building, 2706-W

The project has been approved by the AEC and the release of funds by the Bureau of the Budget will permit design of the facility.

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

Formulation of a FY 1959 financial plan and release of funds is holding up further progress on this project.

Plant Modifications for Reprocessing Non-production Reactor Fuels

Project proposal activity has been instigated to request \$60,000 for preliminary design of facilities for non-production reactor fuel reprocessing.

Liquid Sodium Nitrate, Redox Plant

The liquid sodium nitrate samples submitted by General Chemical Corporation from their Hedges, Washington Plant were within specifications. A bid is now being formulated for presentation to the Chemical Processing Department.

2. Design and Construction Liaison

Cask Car Contamination

Installation of flushing devices on six process casks was started this month. Three casks are now 90% complete and three are 50% complete. Construction of the monorail at the 202-S Building tunnel door for cask car lid removal is complete. However, modification of the existing hoist from one to two ton capacity will be required so that the three cask lids can be removed simultaneously.

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

The acid metering installation is progressing satisfactorily at month end. This equipment will complete the project installed facilities.

CG-686, In-Line Monitoring Instruments, Redox

Work orders and drawings have been forwarded to HLO for fabrication of the steam condensate gamma monitor and the F-1 absorptometer.

CG-718, Fission Products Isolation, 221-B

It is expected that project activity will remain dormant for the balance of the calendar year. Hanford Laboratories Operation is continuing development work on the packaging facility.

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

This project is essentially complete except for change-out of the Wilfrey pump and other clean-up items.

I. Reports Issued

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

III. ORGANIZATION AND PERSONNEL

A. Safety

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

On August 19, 1958, a third party inspector from Travelers Insurance Company inspected the 202-S Building freight elevator. The unit passed inspection with the recommendation that the rust be removed from the metal parts in the shaft. An order has been issued to accomplish this work.

A fire of undetermined origin, at the 269-U Building steam cleaning station, burned down the steam jenny building. An investigation was completed with fire loss set at less than \$500.

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B. Security

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

C. Personnel Activities

Mr. Alvir Josephy, Associated Editor, "Time" Magazine, visited the 200-East Area for the purpose of selecting picture sites for a series of burial garden and liquid waste disposal pictures to be run in the "Time" Magazine.

J. C. Langford, Analytical Chemist, was transferred to the Hanford Laboratories Operation effective August 1, 1958.

C. B. Foster, A. T. Sether, and G. C. Loud, all exempt personnel in the Redox Operation, returned this month from a temporary off-site AEC assignment at Arco, Idaho.

Chas. S. Swinth
Manager
Redox Operation

CT Groswith:HWM:bfg

CHEMICAL PROCESSING DEPARTMENT
FINISHED PRODUCTS OPERATION
MONTHLY REPORT

AUGUST 1958

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I RESPONSIBILITY

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

II ACHIEVEMENTS

Operating activities for the preparation of plutonium metal continued to be erratic during the greater part of the month of August. During the first two weeks of the month it was necessary to favor the 9-A continuous production equipment in order to determine whether this equipment would function properly. Unusual difficulties, most of which were associated with equipment design, were encountered and production progress was poorer than desired. The temporary 9-B unit was operated whenever 9-A performance was such that departmental continuity appeared to be in jeopardy. Weekly operating efficiencies based on the performance of the units ranged from 18 to 120 percent. The lower efficiencies were experienced during the time when the production load was being switched back and forth between the two units. Limited mother liquor handling facilities precluded operating both units simultaneously. During the last two weeks of the month the 9-B unit was operated while the 9-A unit was receiving attention directed toward correcting certain inefficiencies. Poor progress was also shown during this period but was due to the fact that feed deliveries lagged.

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II ACHIEVEMENTS (cont'd)

A. Metal Finishing Operation (cont'd)

C. Uranium Reduction Operation

Operation of the calciners and associated equipment proceeded normally and shipping schedules were maintained, 358, 565 lbs. of 100% nitric acid were produced and sent to Redox and Purex Plants. At month end there was 120 tons of acceptable uranium as JNH feed awaiting recovery.

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D. Maintenance Operation

The principal maintenance problems in Z Plant continued to center around the new continuous Task I and II units. Plugging of the lines and filters, and the resultant poor vacuum on the fluorinator, together with the buckling of the platinum liner and heating element failures resulted in considerable repair work. Considerable difficulty was also encountered with the feed vibrator. Maintenance problems in Task II, IV, and V were routine. Recuplex experienced two bellows failures on the H-1 column and several pump failures. Other maintenance activities within the plant were routine.

Equipment performance at the U Plant during the month was reasonably good with only two major failures involving the continuous calcining units. One failure (G) involved damaged agitators, feed points and thermowells. The other (J) involved damaged agitators and unloading weir. Maintenance repair work on the powder handling system and acid recovery equipment was favorable, with less than the normal amount of trouble. The concentration equipment, the UNH feed system and the waste handling equipment experienced considerable plugging of the lines, filters, and valves. The installation of fluidizing valves on the calciner unloading lines was started this month. The one valve installed proved to be a great improvement over the rotary valve previously in use.

E. Analytical Control Operation

A total of 7736 determinations were performed on 1550 samples received during the month.

F. Radiation Monitoring Operation

Eighteen radiation occurrences were documented and twenty-three cases of skin contamination were reported in August. The average stack emission was 17.4 c/day which indicates somewhat less control than was experienced in June and July. Filter changes

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F. Radiation Monitoring Operation (cont'd)

in the 9A-9B exhaust system appeared to remedy the problem and at month end average emissions were less than 5 c/day.

The radiation exposure problem in the 234-5 Building continued to improve. The projected average per operator for 1958 was 2.3 r. Operator rotation among the various components in the Finished Products Operation will still be necessary to prevent any employee from exceeding the 3 r/year Hanford limit despite this improvement. The temporary halting of fabrication will also relieve the exposure problem to some extent.

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.

H. Events Influencing Cost

In the Product Recovery Operation the sharp reduction in Recuplex solvent extraction waste losses brought about by the system of continuously washing the organic extractant will eliminate plutonium losses in the amount of \$69,100/year. This is conservatively calculated on the basis of a decrease from 0.0047 g/l to 0.0011 g/l plutonium loss per batch, 32,000 liters per month processed and \$50/gram.

I. Plant Development and Expansion

1. Projects: Study, Scoping or Approval Phase

Engineering studies have been instigated prior to presentation of project proposals for waste incineration and leaching, and for additional fire protection for the 234-5 operations. Studies regarding replacement of the 216 WR Cribs at the Uranium Oxide Operation have been requested.

Project scoping studies are being conducted for waste handling at the Uranium Oxide Plant, and for additional plutonium fabrication equipment for the 234-5 operation.

I. Plant Development and Expansion (cont'd)

1. Projects: Study, Scoping or Approval Phase (cont'd)

Project CG-767, Rev. 2, UO₃ Improvements has been submitted for Commission approval. Project CGC-811 requesting design funds for additional fabrication at 234-5 has been submitted to the Commission.

2. Projects: Construction Phase

A total of five 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, and CG-756 Fire-proof Filter Replacement.

Project CGC-800, Reduction of Radiation Exposure, RMA Line, and CA-798, Cribbs and Test Wells, 234-5 Building have been approved and construction funds issued.

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

3. Projects: Completed

The exceptions listed on the completion notice of Project CG-691, Continuous Task I and II, are being studied in an attempt to solve the operating problem.

III ORGANIZATION & PERSONNEL

A. Organization Changes

There were no organization changes during the month.

B. Safety Experience

No disabling injuries or near-serious accidents occurred during the month. Seven medical treatment injuries were experienced as compared to six in July. The frequency rate decreased from 1.33 to 1.28.

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).

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D. Security Experience

There were no security violations experienced during the month.

E. Personnel Activities

Seven exempt employees started Professional Business Management-I during the month. One exempt employee completed "Understanding People". Several non-exempt employees attended the usual miscellaneous courses offered by the Employee Relations Operation.

All members of the Analytical Control Operation listened to tape recordings of recent speeches by Messrs. McCune and Johnson.

F. Miscellaneous

During the week, August 11 through 15, W. N. Mobley, Manager Finished Products, visited the University of California Radiation Laboratory, at Livermore, the Los Alamos Scientific Laboratory, and the Rocky Flats Plant of the Dow Chemical Company for the purpose of discussing weapons technology.

E. I. Brecke, Acting Manager
Finished Products Operation

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CHEMICAL PROCESSING DEPARTMENT
POWER AND GENERAL MAINTENANCE OPERATION

AUGUST 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

Preparations were made for temporary operation of a portion of the equipment in "C" cell of the Hot Semi-Works to perform experimental work for the Hanford Laboratories Operation. Instrumentation equipment was reactivated, cell pressures measured, and piping assemblies made ready, however, later developments indicated the experiments should be conducted at the Purex Facility. The Hot Semi-Works was subsequently returned to lay-away status.

The machining of plutonium fuel elements for the Materials Testing Reactor at Arco was completed on August 12. Forty-six fuel elements were fabricated in the Machine Shop, 27 of which were completed since August 1. Considerable overtime was required to meet delivery dates. The total number of elements required was increased from the original figure of 30 to 46 during the latter part of the program in order for Hanford Laboratories Operation to meet Arco's requirements for low level activity elements. Shop work on this program involved SWP regulations and was completed without incident.

The precision tool and die work performed for the Hanford Laboratories Operation in support of project Quail was completed in mid-August as scheduled. Overtime was required to meet completion dates established for this priority work program.

Corrective alterations to the U2 tank at the Purex Facility were completed on schedule. Steel reinforcing ribs welded horizontally to the exterior periphery of the tank were grossly corroded from chemical spills. These were replaced by sections prefabricated in the Shops. Other work at Purex included installation of a shop fabricated ladder and catwalk for easier and safer access to "C" cell.

The 104 tank in the aqueous make-up room at the Purex Facility developed a leak at the dished head at the bottom of the vessel. The unit was removed to the 277-W Shop where examination disclosed a crack originating at the drain-line had propagated around the entire circumference

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of the bottom section. Conclusions were established that the crack resulted from stresses set up during original fabrication of the vessel. The damaged unit received a new bottom section and a new set of steam coils after which as-built drawings were prepared and the vessel returned to service.

The second of four ammonia scrubbers being fabricated for Purex was completed as per schedule on August 8. The unit was designed for installation in "B" cell. Current estimates indicate the two remaining units are on schedule for completion in September and October respectively.

A spare dissolver vessel was removed from storage at White Bluffs and modified on an emergency basis for installation in the Redox canyon. The existing unit's failure became apparent on August 22 and the spare unit was delivered to the job-site ready for installation on August 29.

Made ready and placed in stand-by status for the Redox Operation was a J-2 caustic scrubber tower. Included in the work of preparing this unit for operation were certain modifications to correct an original construction elevation error disclosed during mock-up. As-built drawings of the unit were prepared for future reference.

Services rendered the Finished Products Operation included modifications to, and installation of a hood to provide refrigerated storage for finished pieces, replacement of the front and rear plexiglass panels on Skull Recovery Hood No. 40, and the installation of a shop fabricated filter box in the 26" vacuum system as a replacement for a contaminated unit. The latter two assignments were completed without incident notwithstanding the potential for high level radiation contamination during the entire progress of the work.

Performed in the 272-E Shop was an experimental demonstration to determine the feasibility of repairing leaking steam lines in the Redox canyon wall by installation of plastic liners. This approach to the problem was developed by Facilities Engineering Operation and it was under their direction that the demonstration was conducted. A section of pipe, sized and formed identical to the lines in the canyon wall was set up in the shop, and the "Fluoroflex - T" liner, with a pre-formed nozzle end, was carried by the crane to the nozzle of the pipe. Men stationed at the other end of the pipe, which would be the Pipe Gallery side, drew the liner into the pipe by use of a fish-tape, cable and clamps. Some difficulty was encountered in forming the liner to match the flange on the gallery side, however this was later corrected by raising the heat in the forming tool. Some cutting of the pre-formed nozzle end of the liner was experienced when a connector head was impacted onto the nozzle. This was eliminated by reworking the gasket retainer in the connector head to remove a sharp edge. Results of the experiment are to be further evaluated by Facilities Engineering Operation and Redox personnel.

Fabricated in support of plant operating continuity were 26 pipe jumpers, eight of which were urgently required for the Neptunium Recovery Program at Purex. The remaining 18 were required for replacements at various locations throughout the prime production facilities and their associated tank farms.

C. Improvement Experience

Savings in the approximate amount of \$25,000 annually will be realized as a result of a reduction in the payroll of five (net) people during the month.

Approximately 55 lbs of grossly contaminated precious metals, previously in service in operating functions, was released to Stores for off-site reclamation. The material was a mix of over 49 lbs of platinum and 5.5 lbs. of gold. It is understood that reclamation processes permit the recovery only of the platinum. Releases of this magnitude arise not more than once a year.

III. ORGANIZATION AND PERSONNEL

A. Safety and Security

The Operation incurred no disabling injuries during the period covered by this report.

Serious Accident No. 58-6 was experienced by this Operation on August 8 when a Crane Operator inadvertently permitted his crane boom to contact a 440 volt overhead power line. No personnel injuries were incurred as a result of the incident. Damage to equipment was in the amount of \$33.75. The incident was investigated and publicized to prevent a recurrence.

No breach of security was experienced.

B. Personnel Activities

Ten instrument mechanics attended craft training sessions.

At the request of AEC J.H. Palmer and W.J. Richardson attended meetings in Chicago, August 20, 21 and 22 to assist in formulating combustion tests on space type filters.

T.S. LeFevre, Manager
Power and General Maintenance Operation

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CHEMICAL PROCESSING DEPARTMENT
FINANCIAL OPERATION

AUGUST, 1958

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I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Product Cost

Procedures manuals, complete with flow charts, were submitted by each unit of the Operation to the Specialist - Office Procedures for consolidation into the over-all Financial Operation manual. As a result of the work simplification efforts incidental to the preparation of the Product Cost manual, approximately 200 man-hours per month of processing time were eliminated which permitted the reduction of one employee. A number of reports were eliminated or consolidated and several systems changes were instituted from which further economies are anticipated.

A meeting called by the local Commission to discuss the institution of a separate AEC financial plan item for minor special requests too small to justify the expense of securing purchase orders and billing was attended. The Commission estimated that authorization for use of this account would be forthcoming either in September or October.

It has been determined that servicing operations' operating reports can be issued to Level 3 and 4 managers one or two days prior to the production components' operating reports, and early distribution of servicing reports will be effected beginning with the August reports. Maintenance and Industrial Engineering Level 5 reporting and R & D prototype reports have now been placed on the Ozomatic process, resulting in additional savings in checking and preparation time.

A revised target budget was discussed with Level 3 managers and consolidated for circulation to the CPD General Manager for review.

Although a number of changes have complicated budget preparation in the last several months, work is progressing on schedule. Items resulting in budget revision and changes are as follows:

1. Downward adjustments to coincide with HAPO General Manager and Commission reductions (Revised FY 1959 Budget).
2. Change in accounting procedures to implement more complete responsibility accounting.
3. Reorganization of Power and General Maintenance.

4. Changes in methods of liquidating Redox, Purex, and Finished Products internal costs (for the purposes of simplification).
5. Alter each of the budgets to provide for fabrication shutdown.
6. Anticipated reorganization within Finished Products.
7. Provision for neptunium recovery budget.

More detailed coding for Metal Finishing Essential Materials was instituted during the month in order to achieve a more exact segregation of material costs between the buttons and shapes operations.

B. Personnel Accounting

Several weeks ago, Personnel Accounting became aware of a practice involving time off the project "interviewing for placement with other companies", which was not specifically covered by contract authority or special reimbursement paper.

The question originally raised by CPD developed the information, through subsequent discussions in meetings of Managers - Finance and Employee Relations Managers, that normal General Electric practice permits exempt employees, who have received their notice, time off for placement interviews.

If an off-project trip is made by the employee solely for this purpose, the payroll should show a charge against "personal reasons". If such an interview can be combined with a business trip, it is understood that all of the interview will be charged to work time.

If the employee is being interviewed for a job with the AEC, either locally or at some other AEC installation, an informal agreement exists that such time off will be reported and paid as work time.

Under the circumstances it was felt that modification of Appendix "B" or special letter of authority was not necessary for reimbursement of these payroll expenses.

Several parts of the existing HAMTC agreement have, from a Personnel Accounting viewpoint, been difficult to interpret so that each payroll group would uniformly and correctly make payment in all like situations. Managers - Personnel Accounting have made a strong effort to get at the root of this difficulty through "task force" action during two of their recent meetings. A review of the HAMTC Agreement was made and a listing of all points which have created problems in the Personnel Accounting area was prepared and forwarded to the respective Managers - Union Relations for action.

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Statistics

	<u>Overtime Payments</u>		<u>Gross Payroll</u>	
	<u>August</u>	<u>July</u>	<u>August</u>	<u>July</u>
Nonexempt	\$15 548 *	\$16 215 **	\$ 705 358 *	\$553 179 **
Exempt	<u>3 558</u>	<u>3 880</u>	<u>347 803</u>	<u>348 946</u>
Total	<u>\$19 106</u>	<u>\$20 095</u>	<u>\$1 053 161</u>	<u>\$902 125</u>

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

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

C. General Accounting

CPD Advice 5.4.4 (Travel, Living, and Moving Expense) was revised and distributed during August.

Sixty-three voucher checks totaling \$267,010.39 were prepared by CPD during August. General Books issued 17 of these checks totaling \$4,038.56. No checks for reimbursement due to contamination of personal effects were issued.

Effective July 1, Relations and Utilities Operation changed their accounting period from a calendar to a fiscal month. Since the Treasury Operation function is a part of Relations and Utilities Operation, cash transactions between the end of the fiscal month and calendar month will not be billed to CPD until the subsequent month's business.

Travel and Living expenses incurred at the Geneva Atoms for Peace Conference will be reimbursed to General Electric on a per diem, rather than actual expense, basis. This is an exception to our contract, which provides for reimbursement of foreign trips on an actual expense basis.

The July General Ledger Trial Balance and Reports of Travel and Living Expense were delivered to Contract Accounting on schedule.

An audit of General Books functions by the HOO-AEC Audit Staff, which was started in July, was completed in August. There were no exceptions.

There were 22 active CPD projects with \$14,115,000 authorized funds as of July 31. Expenditures and commitments of \$9,223,000 and \$852,507, respectively, have been incurred against these projects. Cost of \$128,000 was incurred during July.

Construction Completion and Cost Closing Statements were issued on Projects CG-691, Improved Task I and II Facilities, 234-5 Building, and CG-717, Transfer Facilities for Redox Non-Boiling Wastes.

A physical inventory of 231-Z Building and associated equipment was taken by CPD and HLO personnel. These facilities will be transferred to HLO in September.

A new IBM system for uninstalled equipment will be placed in effect during September.

Obsolete UO₃ equipment aggregating \$488,313 was transferred from the Held for Future Use account to the Not Used Nor Currently Useful account, with a charge of \$343,944 to Extraordinary Depreciation and Obsolescence.

D. Auditing

Formal audit reports were issued in connection with the following audits: (1) Audit of Administrative Services; (2) Audit of Project Material Control, Contract AT(45-1)1179, Jensen-Rasmussen and Company.

An audit memorandum relating to the economical use of office equipment, telephone, and telegrams was directed to the attention of Level 3 managers.

A review was made to determine the need for an audit of CPD Work-In-Process Inventories. The review indicated that the audit time required for a comprehensive audit of these records is not at this time offset by possible benefits that may be expected to accrue from such an audit. This review recognized the following facts:

1. The relatively fast turnover of CPD Work-In-Process Inventories.
2. The extent of AEC scrutiny given our booking, pricing and reporting procedures and routines monthly.
3. Adjustments to our inventory balances authorized by the AEC as of December 31, 1957.
4. Conformance of present procedures and routines to applicable AEC Manual Chapters.
5. Findings of a recent audit of IPD Work-In-Process Inventories.

Completion of an audit of materials furnished under Contract AT(45-1) 1138, Hoffman Construction Company, is held in abeyance pending clarification by Project Engineering Operation of questionable items noted in our examination of this contract.

Twenty-eight AEC Manual Chapters were received and distributed.

A summary of AEC Manual Chapters accepted from the Commission for compliance through June 30, 1958, was forwarded to Level 3 managers.

E. Procedures

Approximately two weeks were spent assisting the Supervisor - Monthly and Weekly Payroll in the flow charting of his activities.

Forms work performed during August was as follows: Orders Processed - 62; Designed - 12.

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F. Measurements

The Chemical Processing Department Quarterly Measurement Report covering progress through July, 1958, toward achievement of the Department Goals for CY 1958 was issued.

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

III. ORGANIZATION AND PERSONNEL

A. Personnel Activities

F. A. Fieser, Specialist - Office Procedures, visited G.E. plants at Cleveland, Ohio; Waynesboro, Virginia; and the Procedures Service offices in Schenectady, New York, to review office procedures programs and techniques.

B. Safety and Security

A safety and security meeting for all Financial Operation personnel was held on August 29, 1958.

No medical treatment or disabling injuries were experienced during the month.

No security violations occurred in August.

C. Reports Issued

HW-56966	CPD Operating Report - July, 1958	M. M. McDonald
HW-57079	Essential Material Inventory and Consumption Report - July, 1958	G. E. Dyreng
HW-57147	Redox Cost and Production Analysis - July	G. H. Temple
HW-57148	Purex Cost and Production Analysis - July	G. H. Temple
HW-57149	Finished Products Cost and Production Analysis - July	G. H. Temple
HW-57154	Unit Cost Information - July	B. M. Dobbs
HW-57180	Redox Essential Material Utilization - July	G. E. Dyreng
HW-57181	Purex Essential Material Utilization - July	G. E. Dyreng
CLVI-446	CPD Annual Report of Economy Measures	K. G. Grimm
CLVI-460	CPD Cost and Production Analysis - July	K. G. Grimm
TS - RD	Product Cost Report - July	B. M. Dobbs

Manager - Finance

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G-5

September 8, 1958

CHEMICAL PROCESSING DEPARTMENT
FACILITIES ENGINEERING OPERATION

August, 1958I. RESPONSIBILITY

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

II. ACHIEVEMENTSPUREX OPERATIONA. Research and DevelopmentRare Gas Processing

Processing work by Air Products on specialized rare gas recovery equipment, under contract DDR-45, is progressing according to schedule. An instrument engineering flow diagram covering major process inter-ties between the rare gas recovery facility and the Purex Plant was completed and forwarded to HAPO in accordance with the terms of the contract.

Process Design calculations covering the Case III equipment needed for isotopic separation of xenon have been completed. Plant and equipment layout drawings are being prepared to obtain cost estimates.

Neptunium Recovery

Preliminary design work on process routings and equipment layouts within the Purex Canyon for recovery and initial purification stages of neptunium are underway. The final chemical flow sheets are scheduled for issuance October 15, 1958.

Available process routings have been identified utilizing either the F-4 or F-17 position in the Purex Canyon for the ion exchange column. These routings provide for segregation of the 2DW-vent condensate stream from the 2AW-XAW stream, concentration of the 2DW-vent condensate stream in H-4, receipt of the concentrate together with chemical treatment in J-1, transfer through the ion exchange column into a new tank where the neptunium-free concentrate is combined with the 2AW-XAW stream, and finally, transfer of the composite waste stream to the HA column. The

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possibility of plutonium adsorption by the ion exchange resin currently Permutit-SK, may dictate the use of a geometrically safe resin column for nuclear safety.

Neutron Monitor for Plutonium

An investigation has been started on the applicability of a BF_3 tube neutron detector on the LBXP stream to monitor plutonium concentration. This would be used primarily for process control, as an indicator of partitioning in the LBX column. It is proposed to mount the instrument detector element and pre-amplifier on a cell jumper. It is now necessary to assemble data for calculation of expected sensitivity and of shielding requirements. Electronic development work which has been in progress on detector tubes and equipment is directly applicable to this problem.

B. Process Technology

Prototype Densitometer

Installation of the HA column densitometer has been completed. A continuous indication and recording is now being provided in the control room of the density of the solution near the feed point in the column. The instrument readings are being observed to better develop the inter-relationship of the process variables.

C. Plant Engineering

104 Tank Replacement

Installation of the stainless steel replacement tank for the original 104 tank has been completed. The original tank failed due to caustic embrittlement. The replacement tank was fabricated in the 200 Area shops by modifying an excessed tank from the 221-U Building.

Ventilation Controls - 291-A Building

A study is in progress to correct control problems on the 291-A exhaust damper motors. Initial studies indicate that the instrument air supply which actuates the damper motors is below the minimum pressure required. Investigation of air motor equipment designed for operation at a lower pressure has been undertaken.

Post Acceptance Report

The Post Acceptance Report for Project CA-513-A, B, C and D is complete. It will be ready for distribution during the first week of September.

D. Project Activities*CA-513-E - Second Remote Crane

The fixed price contractor completed his work August 11, 1958, with exception of replacing glass panels in six doors with steel panels. The panels are expected on site in mid-September.

Construction Operation is working on several clean-up items in preparation for beneficial use of the crane facility.

CG-766 - Additional Ventilation for Purex P & O Gallery

Beneficial use was attained August 15, 1958. Work is complete except for painting of the exterior ductwork.

REDOX OPERATIONA. Process TechnologyBuried Piping

Installation tests of the Flourofex-T plastic tubing in a bent section of 2-inch schedule 40 stainless steel pipe were made in the shop with successful results. These tests consisted of installing a length of tubing in a section of pipe bent to the same pattern as those pipes in the Redox Building which have failed due to corrosion. The tests included the use of the shop crane and the installation duplicated the procedure which would be used in the process building for this repair work. It was found that an improved metal tubing connection is needed as well as a better tubing clamp for fastening the tubing to the connection. It was also revealed that the gasket retainer in the jumper connector will need to be modified to prevent damage to the flared tubing end when this connector is impacted to the cell wall nozzle. These are minor refinements which can easily be made.

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

Semimonthly Status Report
AEC-HOO Monthly Progress Report of
Construction Jobs

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B. Plant Engineering

Hexone Loss Follow-Up

Data from July 18 to August 26 were analyzed to evaluate changes in hexone consumption resulting from adoption of the recommendations of previous Industrial Engineering study. Present indications are that consumption is now in the vicinity of 200-300 pounds per ton. Further improvement may be possible.

FINISHED PRODUCTS OPERATION - Z PLANT

A. Research and Development

Chemical Processing and Reduction

Difficulty has been encountered in Hood 9A in obtaining satisfactory feeding characteristics of the vibrating tube. In order to collect engineering data on the many variables which affect the vibrating characteristics of the tube, a complete unit was obtained from Spare Parts and installed in the basement of 271-T Building. Although tests show that there is a considerable difference in the characteristics of the units in Hood H9A and H9B and the spare, it is hoped that information obtained from the spare unit can be used to improve the production models.

Weapons

A rough draft of the design scope document on additional RMC fabrication line facilities was issued during the month. This rough draft was accompanied by approximately 30 drawings prepared for use in the design scope and for cost estimating purposes.

All design work on the degreasing and briquetting hood was completed during the month and all drawings were approved.

Z Plant Radiation Study

An interim report on the effectiveness of the Hood 9A cleaning equipment in controlling radiation exposure levels was issued for comments. Preliminary results show that in the upper section where the vacuum cleaning equipment has been used consistently the gamma radiation level after two week's operation was 7 mr/hour outside the panel, as compared to 17 mr/hour for Hood 9B after a comparable operating time. The effectiveness of cleaning equipment in maintaining low exposure levels

over a long period of operation has not been established, but it is believed that a five-fold reduction can be expected.

Hood Development

The design of a prototype hood cell enclosure for wet chemistry and powder preparation equipment was completed. Drawings were submitted to Power and General Maintenance for construction cost estimates.

B. Process Technology

Chemical Processing and Reduction

Efforts were continued throughout the month to develop improvements to the fluorinator off-gas system. A test set-up was made in the 300 Area for testing a filter installed in the banjo valve in the fluorinator discharge. Also a new type filter which is to be installed inside the fluorinator tube was designed and the material ordered so that this type of filter could be fabricated and tested.

Designs were prepared for improvements to the J-4 loadout tank in Recuplex and for reactivating and improving the Task III pickling hood. At the request of FPO, drawings are being made for converting the Task III balance to a density balance. Since this appears to be a very complicated conversion, study stage drawings are being made to permit full evaluation of the work.

Recovery of Pu from Miscellaneous Wastes

Process design drawings of the facilities for the recovery of plutonium from miscellaneous 234-5 Building wastes have been completed. These drawings and a draft of a report have been issued for comments. The proposed facilities will be housed in a new 35' x 60' single story building situated 180 feet south of the 234-5 Building and 80' west of the stack. The equipment consists of a sorting hood, a leaching and washing hood, an ash canning hood, an incinerator and off-gas system for scrubbing and filtering the flue gas and hood exhaust gas.

C. Plant Engineering

Z Plant Maintenance Program

The program recommended to improve the planning and scheduling of Z Plant maintenance was adopted, and steps have been taken to place the program into effect. Individual craftsmen have been assigned responsibility for the preventive maintenance and repairs of designated equipment. The nature of the maintenance work done is being received

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in greater detail to facilitate the keeping of an equipment history file and to obtain information on the time required to perform jobs.

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D. Project Activities

CG-756 - Fire Resistant Exhaust Filters - Z Plant

The last filter box installation was completed on August 20, 1958. Steps are being taken to close out the project, listing an exception consisting of a wall closure. This work was not completed previously because of decision to provide access doors to permit ready installation of any future filter box installations.

FINISHED PRODUCTS OPERATION - UO₃ PLANT

A. Process Technology

UO₃ Recovery from Filter Bags

A modified laundry tumbler installed in E-cell of the 224-U Building for cleaning used filter bags was tested. Two bags from the X-28 filter were cleaned by tumbling and approximately 95 percent of the powder adhering to the bags was recovered. On the basis of this run, it was decided the method had definite promise and minor modifications are being made to the tumbler to improve the operation. It appears feasible to clean the bags without slitting them open thereby permitting them to be reused.

B. Project Activities

CG-725 - UO₃ Plant Waste Treatment

The revised scope design covering the latest approach to waste handling and treatment in the UO₃ Plant, involving concentration of waste within C-2, was completed and issued for further project activity in obtaining the required equipment.

GENERAL ACTIVITIES

A. Process Technology

Burial Boxes

Two of the fabricators contacted concerning the feasibility of making burial boxes out of sheet steel panels submitted proposed design

sketches for this work. These tentative designs are presently under study in an effort to decide which design is the most functional and economical.

High Level Waste Storage

A leak detection system has been conceived which would supplement existing dry wells and instrumentation at Purex and Redox tank farms. The system consists of a 12-foot diameter caisson about 68 feet deep constructed of carbon steel liner plate. Each caisson would serve three waste storage tanks with a horizontal grid system of 4-inches inside diameter pipe. There would be five of these "drifts" extending 100 feet radially from the caisson under each tank. The 4-inch drift would be connected to a large radius elbow and extended inside of the caisson to ground level. It is planned to leave sleeves empty for insertion and removal of a scintillation detector or ion chamber, or soil moisture content indicator.

B. Plant Engineering

Turbo-Generator Investigation

A study is under way to determine the cause of failure of the 750 KW turbo-generator unit at 284-W Building. The disassembly of the turbine and the generator has been completed as far as necessary for the investigation. To conclude the study, reports from the metallurgical work performed in the 300 Area, and from the representatives of the generator and turbine manufacturers are necessary.

Results of the study to date indicate that the destruction of the unit was due to an overspeed condition. Failure of some part of the governor and over speed trip device apparently allowed the unit to reach the critical speed.

Recommendations will be made in the final report for changes in control and maintenance procedures to reduce the possibility of a similar incident on other units.

C. Project Activities

Project cost information as of August 17, 1958:

Total authorized funds - active projects	\$14,073,000
Total cost to date	9,320,000
Commitments and open work releases	1,659,000
Unencumbered balance	3,094,000
Costs charged to above projects 7-20-58 to 8-17-58	159,000

DECLASSIFIEDIII. ORGANIZATION AND PERSONNELA. Personnel

T. R. Workinger, Engineering Analyst, resigned effective August 15, 1958, to accept employment with the AEC.

Jewell A. Smith, Secretary, was transferred to a promotion in the Redox Technology Operation on August 18, 1958.

Virginia S. Conner, Secretary, was transferred to a position in R&E Operation during August.

B. Safety

Prompted by the numerous near-serious incidents recently in the Department, the regular monthly safety meetings have stressed the importance of close personal attention to equipment safety.

C. Inventions

<u>Name</u>	<u>Title</u>	<u>Date</u>
G. A. Conner	A Remotely-Opened Welding-Hood Viewing Window Device (three alternate methods were submitted)	August

D. Reports Issued

- HW-55653 - Project Proposal, Revision 2, Miscellaneous Improvements, UO₃ Plant, CG-767, by L. W. Finch, July 17, 1958.
- HW-57124 - Project Proposal, Revision 1, Plutonium Recovery from Contaminated Materials, 234-5 Building, (Project CGC-813), by D. A. Snyder, August 11, 1958.
- Rough Draft - Design Scope - Additional Pu Fabrication Facilities, by R. A. Ciccarelli, August 14, 1958.
- HW-57210 - Scope Design of Waste Handling Facilities - UO₃ Plant - 224-U Building, Project CG-725, Revision 2 by J. M. Gerhart, August 19, 1958.
- HW-56754 - Consideration of Use of Titanium Clad Vessels in Redox D-12 and Purex F-6 and F-11 Positions, by A. C. Morgenthauer, August 28, 1958.

E. Trips

D. W. McKee was in Seattle and Tacoma, Washington, and Portland, Oregon, August 26 and 27, 1958, to visit the Van Vetter, United Products, and Northwest Copper Companies to discuss and resolve problems on equipment being fabricated by the vendors.

J. W. Kolb visited UCRL, Livermore; Albuquerque Operations Office; Los Alamos Scientific Laboratory; and the Dow Chemical Company for the purpose of obtaining information that will support the FY 1959 construction program.

F. Visitors

On August 7, 1958, Mr. V. L. Stevens, Manager, Mining Division of Boyles Brothers Drilling Company visited HAPO and discussed leak detection methods with E. Doud, L. B. Bradley, R. E. Brown and H. W. Stivers.

Messrs. J. C. Gigar and J. P. Scholtes of the Rockwell Manufacturing Company visited the Hanford project to perform servicing of a prototype Rockwell Roto Meter. J. M. Gerhart was their escort during their visit August 26 and 27, 1958.

Other visitors to HAPO included the following:

<u>Date</u>	<u>Individual</u>	<u>Firm</u>	<u>Reason</u>
August 6, 1958 August 14, 1958 August 15, 1958	K. Jones	Travelers Insurance Co.	Investigate Turbine Failure 284-W Building
August 7, 1958	F. Robinson	General Electric Co. Apparatus Department (Pasco)	Investigate Turbine Failure 284-W Building
August 13, 1958	R. Myers	Betz Laboratory Inc.	Steam Condensate Consultant
August 14, 1958	Renald Gray	General Electric Co. Apparatus Department (San Francisco)	Investigate Turbine Failure 284-W Building
August 14, 1958 August 15, 1958	John Williams	Pacific Steam Control Company	Investigate Turbine Failure 284-W Building

Manager
Facilities Engineering Operation

HP Shaw:FC:mh

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CHEMICAL PROCESSING DEPARTMENT
RESEARCH AND ENGINEERING OPERATION

AUGUST 1958

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PUREX PROCESS TECHNOLOGY

Neptunium Recovery

Immediately prior to the plant shutdown on August 3 for a special neptunium recovery operation, the neptunium inventory (400 to 500 grams) in the backcycle waste stream (3WB) was suddenly lost via the HAW. By proper segregation of waste, the neptunium was retained in about 6800 gallons of IWW which later formed the feed for the neptunium recovery run starting August 8. The chemical flowsheet employed during the recovery operation is shown below.

TABLE I
CHEMICAL FLOWSHEET
NEPTUNIUM RECOVERY FROM IWW

<u>Stream</u>	<u>Flows</u>	<u>HNO₃</u>	<u>Fe(SA)</u>	<u>Temp.</u>	<u>Others</u>
HAF	100	4.5 <u>M</u>	0.10 <u>M</u>	25° C	0.5 <u>M</u> SO ₄ 0.4 <u>M</u> ANN
HAS	30	1.5 <u>M</u>	0.10 <u>M</u>	35	
HAX	162	-	-	35	
HAW	130	-	0.10 <u>M</u>	-	0.3 <u>M</u> ANN
HAP	162	-	-	-	
LBXF	187	-	-	35	
LBX	50	0.05 <u>M</u>	0.03 <u>M</u>	-	
LBS	24	-	-	35	
LBP	50	1.3 <u>M</u>	0.03 <u>M</u>	-	
2AF-HNO ₃	35	13.0 <u>M</u>	-	-	
2AF	105	5.0 <u>M</u>	0.015 <u>M</u>	50	
2AS	14	1.0 <u>M</u>	-	-	
2AX	59	-	-	35	
2AW	119	4.0 <u>M</u>	0.013 <u>M</u>	-	
2BX	20	0.10 <u>M</u>	-	-	
2BP	20	0.70 <u>M</u>	-	-	
2BP-HNO ₃	0.002	13.0 <u>M</u>	-	-	

Aluminum nitrate was added to the feed (HAF) to produce a two-fold increase in the neptunium E o/a by complexing the sulfate in the IWW. The one major equipment change, made prior to the operation, provided a routing for the transfer of 2BP back to the 2AF Tank which permitted operation of the Final Plutonium Cycle on total reflux. Operation of the process was smooth with reasonable losses of neptunium in the HA and LBX and LBS Columns thus resulting in approximately ninety percent of the neptunium in the feed being collected in the 2AF Tank. The addition

of cold synthetic LBP to the 2AF Tank and refluxing of the 2BP continued after shutdown of the LBX Column until a gross gamma decontamination factor of 10^8 had been obtained on the neptunium in the 2BP. 2A Column losses averaged 0.2 percent of the neptunium in the 2AF Tank. Plutonium contamination in the product after solvent extraction was approximately 5000 parts per million parts of neptunium. After the decontaminated 2BP stream was steam stripped and concentrated (to 11.7 g/l.), a total of 370 grams of neptunium-237 were removed from the stripper-concentrator (including flushes). The product solution was transferred to the Chemical Research Operation on August 15 for purification and concentration by anion and cation exchange which removed the plutonium, natural thorium, UX_1 , and residual fission products.

Solvent Extraction

After the solvents in both the No. 1 and No. 2 Solvent Systems were washed (see Solvent Treatment) and the various waste rework solutions from the neptunium run accumulated and concentrated, normal operation of the plant was scheduled. The gamma activity throughout the plant was high at start-up, partly because of EWW processing for neptunium recovery and partly as a result of an inadvertent waste rework addition to the backcycle waste tank. Although the plutonium product (after ion exchange treatment) met specifications within two days after start-up, four more days of steady-state operation were required before the uranium product was within specifications without silica gel treatment. Normal two-cycle flow-sheet conditions, except for zero EOO flow (fresh IOO to the HA Column scrub section), were maintained to produce a neptunium reflux in the backcycle waste stream.

Shortly before the end of the month, material removed from a partially plugged diaphragm-operated valve in the LBXF line proved to be small fragments of polyethylene sieve plates presumably from the HA Column scrub cartridge. Color comparison of the fragments with irradiated polyethylene samples indicated that the pieces had been exposed to approximately 10^8 roentgens which is within the irradiation range that reduces the strength of polyethylene to a minimum. Although a replacement scrub cartridge is being assembled, both the quantity of polyethylene collected so far and the decontamination performance of the HA Column leads to the conclusion that the polyethylene came from a limited number of plates, possibly from within the area of highest radiation near the feed tee. Normal plant processing continues with a screen around the LBXF pump section to prevent dispersal of the polyethylene fragments throughout the entire plant.

Waste losses during the processing of irradiated uranium were normal except for a short period of temporary high plutonium loss (up to 1.6 percent) in the 2BW. An attempt to reduce a high 2AW plutonium loss (resulting from an unknown but excessive 2AS flow caused by rotameter failure) by increasing the 2AX flow resulted in a "pinch" in the 2B Column operating conditions. Approximately 130 grams of plutonium are contained in the 2OW carbonate solution held for future rework.

Other items of interest during the month were:

- a) During the neptunium recovery run the 2A and 2B Columns were operated at an equivalent capacity factor for plutonium processing of 4.25 and 6.85, respectively.

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- b) Decontamination of the failed HS Column is in progress to permit repair of the leak.
- c) A revised critical mass document, HW-56913, "Process Specifications for Critical Mass Control - Purex Plant (Revision No. 2)," E. R. Irish, (Secret) July 30, 1958, was issued.
- d) HW-56887, "Purex Test Program, July through December," G. C. Oberg (Confidential), July 23, 1958 was issued.

Solvent Treatment

The gamma activity of the IOO increased from a normal 1500 uc/gal to a peak of 16,000 uc/gal during the neptunium recovery operation. The activity was reduced to approximately 5,500 uc/gal prior to plant start-up by recirculating the solvent through the No. 1 Solvent Treatment System which was operated on the normal flowsheet.

The gamma activity of the 200, which had increased from 45 uc/gal to approximately 400 uc/gal during the neptunium run, was reduced to about 20 uc/gal by transferring sixty percent of the solvent to the No. 1 System as make-up solvent, batch-washing the remaining solvent with carbonate-permanganate solution and increasing the inventory back to normal with fresh solvent. However, despite a rapid buildup of the gamma activity in the 200 to 200 uc/gal (essentially all ruthenium) after start-up, no adverse effect was noted on decontamination in either the Final Uranium or Plutonium Cycles.

Waste Treatment and Acid Recovery

Wastes from the neptunium recovery operation were successfully processed by the waste handling equipment. High salt waste containing aluminum nitrate was neutralized without concentration by "reverse-strike", while the remaining wastes were concentrated for acid recovery. Prior to normal plant start-up, two waste concentrator tube bundles (one in E-F11 and one in E-F6) were replaced because of failure after 31 months of service. Concentrated efforts to attain the flowsheet IWW flow (5.0) have resulted in a IWW flow of 5.8 for an extended period of operation.

The recovery of nitric acid from the Backup Facility remains at eighty to ninety percent with the primary absorber making fifteen percent acid and the secondary absorber making eight percent acid. The secondary absorber, which is a converted caustic scrubber, recovers approximately 15 percent of the total nitric acid recovered in the Backup Facility.

UO₃ recovered acid was blended with Purex Plant recovered acid at a weight ratio of 0.16 UO₃ HNO₃/Purex HNO₃ to form feed for the vacuum acid fractionator. No detrimental process effects were noted as a result of this blending, and it eliminates variations in UO₃ acid strength such as have been noted in the past.

Self-concentration in Tanks 241-A-101, 102, and 103 continues at boil-off rates of 5.6, 6.9, and 2.1, respectively. In preparation for storage of high activity

wastes in TK-241-A-104, the fission products from about 130 tons of irradiated uranium plus 100,000 gallons of water were added to the tank. The heat generated by the fission products is being distributed by a recirculation pump and should heat the tank to about 150° F. This relatively slow temperature rise and an extended holding period at about 150° F will decrease the stresses developed within the structure during the initial fill period and thus increase the integrity of the tank.

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DECLASSIFIEDREDOX TECHNOLOGY OPERATIONAcid Recovery and Iodine Removal

The efficiency of the acid recovery system averaged only 71 percent, at an acid concentration of 47 weight percent, due to the seasonal increase in cooling water temperature, erratic control of the oxygen concentration in the absorber feed and the relatively slow dissolution rates occasioned by heel removals and the processing of Chalk River material. The oxygen analyzer was found to be very sensitive to changes in the sample pressure, so further revision of the sampling system will be required before satisfactory performance of the oxygen controller can be obtained. Conversion of the scrubber to a secondary acid absorber and installation of air-bleeds at the inlets of the diversion valves were deferred because of production demands.

The installation of the prototype silver reactor in A Cell was completed early in the month following partial failure of the A-3 off-gas heater. Innovations incorporated in the prototype reactor system include (a) supporting the heater on wall nozzles to permit greater reactor height and diameter; (b) arrangement of the packing in three sections, stacked vertically, with individual sample-regeneration lines to each section, and (c) valves to permit by-passing of the reactor during coating removal. The new reactor provided a total packed volume of approximately 50 cubic feet and a packing depth of 11 feet compared to a packed volume of 23 cubic feet and packing depth of 7.7 feet for the standard reactor. Limited testing of the prototype system revealed no evidence of iodine emission during coating removal and at least 99.3 percent efficiency during dissolution as indicated by the iodine concentration in the recovered acid. More extensive evaluation of the reactor efficiency will be initiated when provisions are completed for drawing samples through the sample-regeneration lines.

The emission of iodine-131 to the stack averaged 0.47 curies per day with nearly all of this amount being discharged through the sand filter. Analyses of the individual streams routed to the sand filter revealed the major portion of the radioiodine to be entering the sand filter via the air-vent header which serves the metal solution tanks. The use of mercury in the metal solution, following dissolution, to suppress iodine evolution through the air-vent header will be evaluated in the near future. On two occasions, following week-end shutdowns, significant iodine-131 evolutions via the condenser vent header were observed. These emissions are suspected to result from the gradual radiolytic reduction of dichromate ions, and subsequently iodate ions, in the waste retained in the waste concentrator and should be alleviated by the mercury addition previously mentioned.

Solvent Extraction

The deposition of solids in the bottom portion of the 1A Column, and resultant flooding, was effectively controlled by maintaining the LAW salt strength above 1.25 M in aluminum nitrate through the recycle of approximately 20 percent of

the LAW stream to the LAFS concentrator. Tests of the processing capability of the LA Column after two weeks of operation failed to cause flooding at rates up to 150 percent of the Phase II instantaneous rate. At the month's end a processing rate of 120 percent of Phase II was being maintained without indication of flooding.

The interfaces in the HA and HS Columns were raised from below the feed tee to the mid-point of the 20-foot scrub section to permit more efficient decontamination from strontium and cesium fission products. Limited analyses indicated a two to ten-fold improvement in over-all decontamination from strontium but insignificant change in the efficiency of cesium removal.

Overall recoveries of plutonium and uranium for August were very good, averaging 99.68 and 99.86 percent respectively, while the corresponding recoveries in the extraction system averaged 99.89 and 99.98 percent. Both product streams met the specifications for fission product contamination throughout the month; however, during the last week of operation, erratic acid control in the extraction system impaired the decontamination from ruthenium, necessitating ozone treatment of the uranium stream.

Waste Storage

Excavation and inspection of the 113-SX fill-line revealed the encasement to be relatively uncontaminated, thus eliminating the possibility that waste had leaked in behind the liner and subsequently escaped to the ground. Further investigation of the tank distortion will depend on the use of a periscope or photographic techniques, and, based on earlier experiences, will probably require sluicing of the tank to reduce the radiation level and temperature. Earlier inspection of the tank wall may be possible if a layer of water is added to the tank to provide both cooling and shielding.

Starting approximately 16 days after the 113-SX tank was emptied the liner again rose, over a 15-day period, to a height 40 inches above its original position. The temperature, as indicated by the mercury-filled thermometer, rose from an average of 218°F to 224°F about two days prior to the movement of the liner. The liner returned to approximately normal position near the month end several days after an apparent decrease in the temperature. During the course of the second rise of the liner, it lifted the pump (used to empty the tank in July) about eight inches despite the fact that it was still attached to the discharge jumper. The pump had not been bolted down. Since the pump will not now run, it is presumed that the shaft was bent by the pressure, and thus it appears that a replacement pump will be necessary before any sluicing and sludge removal can be started.

Over-concentration of the contents of the 114-SX tank while it was being filled caused the temperature to rise above 300°F necessitating the addition of water to the tank. The addition of water via the circulator air lines over a three-day period, as previously employed in diluting the 107-SX tank contents, apparently failed to provide sufficient circulation to prevent bumping. Pressure surges equivalent to 16 percent of the hydrostatic head were recorded, and it is possible that one surge of unmeasured intensity may have approached the 20 percent maximum previously encountered in the Purex tank farm. Facilities are being provided to permit water addition, below the liquid level, without necessitating deactivation of the circulators.

FINISHED PRODUCTS TECHNOLOGY OPERATIONURANIUM CONVERSION OPERATION**DECLASSIFIED**Process Performance

All UO_3 produced met product specifications.

Nine hundred sixty-seven (967) pounds of nitric acid per ton of uranium processed (91.7% of theoretical) were recovered. The concentration of the recovered acid averaged 48%.

The average operating rate of the calciners was 7.24 tons uranium per calciner for each day on the line.

The performance of the Micro Pulverizer mill was not significantly changed when the retention screen was opened to 5/32 inch from 1/8 inch. No change in particle size nor size distribution was detected.

Process Improvement

Filtration of sump waste through a layer of Dicalite #4200 filter aid (diatomaceous earth) deposited on an Adams filter cartridge was tested. About 400 gallons of waste passed through a 1/16 inch precoat at a 2.9 gpm average rate before pluggage occurred. Eighteen hundred (1800) gallons of waste were filtered without pluggage through a 1/8 inch precoat at an average rate of 2.3 gpm. The addition of filter aid to the C-2 sump waste tank with agitation resulted in 780 gallons of waste being filtered through a 1/8 inch precoat at an average rate of 0.57 gpm. The low rate was caused by the accumulated "crud" that was stirred up from the bottom of the tank with agitation. A flush of the sump tank will be made prior to further testing.

Two agitator failures, which were similar in nature, occurred during the month. The drive end hub assembly was severely damaged in both H and J calciners when the welds on the blade support part of the arm assembly failed. Damage in the H calciner also included bent blades, sheared pins, two bent thermowells, and a broken feed point. The damage in J calciner was less severe but included a bent weir. New hub assemblies were installed at the drive end location in both calciners. These assemblies were provided with a 3/4 inch diameter shear pin with a 5/8 inch relieved shear diameter. A complete change of shear pins was made in both calciners.

Four feed points were found to have small cracks on the flat section of the steam jacket close to a weld. One feed point was broken when caught by a loose agitator blade in the H calciner failure.

Facilities for providing a continuous air blow of feed lines during shut-down periods were installed in two cells. This installation reduces the manual work required for shut-down and start-up of a calciner.

METAL FINISHING OPERATIONRecuplex

Twenty-eight (28) runs, consisting of crucibles, fragments, powders, plutonium-aluminum alloy and cleanouts, were processed through the S and C Hood. Slurry losses averaged 0.56% of the recovered plutonium.

The SE columns processed 1210 liters per day at 62% operating efficiency for an average instantaneous rate of 1960 liters per day. Waste losses to crib averaged 0.0069 g/L or 0.78% of the plutonium processed.

A semi-continuous solvent washing procedure, to remove residual plutonium from the solvent, was started. The solvent returning from the columns is contacted with a ferrous ammonium sulfate-sulfamic acid wash as the receiver tank is filling. When the receiver tank is full and the solvent is ready for reuse, the solvent receiver and feed tanks are reversed, thereby permitting essentially plutonium free solvent to be fed to the columns. The wash solution is changed daily. The average column waste losses over a one-week test period were 0.003 g/L compared to an average of 0.007 g/L before the test.

Tasks I and II

Two hundred fifty-five (255) runs were processed with an average supernate recycle of 4.19% of the feed.

A three-liter precipitation vessel has replaced the five liter vessel originally installed in the second continuous unit (Hood 9-A). The quality of the precipitate was improved by this change. Except for the fluorinator, the Hood 9-A unit is operating satisfactorily. Powder does not flow through the tube as required. Weights have been added to the system and some improvement has been made though additional work is required.

The continuous filtrate decomposition unit (Hood 7-A) was started up during the month. Operation has been good, though a few minor difficulties have been experienced. Manganese dioxide solids built up in the "U" tube between the permanganate addition tank and the peroxide addition tank. This was eliminated by the addition of a continuous air sparge.

The metal (Hastaloy "C") Poroloy filter, installed in the Hood 9-A fluorinator off-gas system, has operated very satisfactorily. The efficiency of this filter is greater than 99.8%.

The neutron counter installed in the D-6 drain line coming from the fluorinator off-gas system has shown that no product has entered the D-6 drain system from Hood 9-A. This instrument has good sensitivity. A 127 gram plutonium fluoride source, held outside of the BF₃ tube well, gave a reading of 50,000 c/m above background.

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PROCESS CHEMISTRY OPERATION**DECLASSIFIED**REDOX PROCESS STUDIES1A Column Flooding

Laboratory work done in support of Redox Plant efforts to prevent periodic flooding of the 1A column has centered around a study of the precipitate found in the 2AW stream. The solids, composed mainly of iron with lesser amounts of chromium and aluminum, adhere tightly to stainless steel but are easily dissolved in dilute nitric acid. The laboratory work, since verified by plant tests, also showed that the formation of the precipitate could be retarded or prevented by an increase in the aluminum nitrate content of the 1A feed.

Compatibility of Recuplex Feeds with the Redox Process

A study of the process feasibility of processing Recuplex SCF (slag and crucible solution) in the Redox Plant, for the recovery of plutonium has been commenced. Thus far, three different processing schemes have been proven feasible: addition of SCF in the head-end, before the $KMnO_4$ catalytic kill; addition to the 2AF; and addition to the 3AF. In tests of the first plan (addition to the head-end) batch counter-current runs with feed containing 1 part SCF per 2.34 parts of dissolver solution gave plutonium and uranium waste losses that were higher than normal by factors of about two and three, respectively. Fission product decontamination was about the same as in the control run. Satisfactory results were also obtained in batch counter-current runs simulating the 2A column and the 3A column, with 100% SCF as feed.

WASTE SYSTEM STUDIESConcentration of Purex Two-Cycle Waste

Laboratory studies of some of the variables affecting the properties of Purex two-cycle waste during boil-down have continued for several months. In general, the work has been done by the boil-down of samples of synthetic waste and measuring the boiling points of the samples at various sodium molarities. The results thus far are as follows:

- 1) Repeated, successive boil-down and dilution of a waste sample causes a gradual change in the characteristics of the slurry. The main effects noted with successive boil-downs of the same sample are a) an increase in the settling rate of the precipitate at a given sodium molarity and b) a decrease in the sodium molarity at which the rapid temperature increase occurs with continued heating. With some samples, freshly prepared, sodium concentrations as high as 15 M have been reached before the sludge went dry and the temperature excursion occurred. With four repeated boil-downs, the corresponding sodium concentrations dropped to a point as low as 11.5 M.
- 2) Samples of waste differing only in the order of addition of the reagents were compared. One set of samples was prepared by adding the carbonate

solution (simulating the plant organic wash) to acid LWV prior to neutralization, the other set by neutralizing the acid LWV first. The first set, in which the carbonate was presumably destroyed by the acid, gave the rapid temperature rise at a much lower sodium concentration than the second set, which still contained carbonate (0.8 M at 5 M NaNO_3).

- 3) Exposure of a sample to total radiation of $4 \times 10^6 \text{ R}$, over a period of five days, also had the effect of lowering the sodium molarity at which the temperature excursion occurred.

From the results described above, it is apparent that the experience with the Purex self-concentrating waste tanks, in which temperature excursions have occurred at sodium concentrations as low as 9 M , can be at least partly attributed to the long exposure of the sludge to high temperatures and/or high radiation.

Chlorine Studies with the Silver Reactors

A survey has been made of sources for the relatively large amounts of chloride found in used Redox silver reactors. It has been estimated that the uranium metal contributes about six grams of chlorine per ton of uranium, and the coating waste heels another 10 grams per ton. That chlorine in the dissolver off-gas stream reduces the iodine-absorption capacity of a reactor was very graphically demonstrated with the laboratory reactor. The upper part of the reactor was saturated with iodine, then exposed to chlorine (in air - NO_2) at 190 C . Immediate displacement of the iodide by chloride occurred. The reaction appeared to be quantitative and irreversible.

ANALYTICAL ASSISTANCE

Determination of Silicon in Recuplex Slag and Crucible Dissolvings (SCF)

In conjunction with studies carried out by the 234-5 Development Operation to determine the feasibility of processing Recuplex SCF solution at Redox, a spectrographic method has been adapted for the analysis of soluble silicon in SCF solutions. The method consists of loading an aliquot of an aqueous dilution of the sample onto a pair of machined copper electrodes and analyzing by high voltage spark excitation. Tests using various chemical forms of silicon demonstrate that the method is also valid for volatile forms of silicon, such as the fluosilicate. As currently used, the method has a sensitivity (lower detection limit) of 1000 ppm of solution.

Analysis of Special "E" Metal Dissolver Solutions

The special "E" metal fuel element measurement program which was performed as a service to the Reactor Study Group of IPD has been completed. The analytical results are summarized below.

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SPECIAL "E" METAL MEASUREMENT PROGRAM
ANALYTICAL RESULTS

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	Tube Numbers				Mixture No. 1(1)	Mixture No. 2(2)
	2163-B	2062-B	2162-B	2063-B(3)		
Original Enrichment						
Wt. % U-235	0.94	0.94	0.94	0.94	0.94	1.44
Analytical Measurements						
Gram Pu Ton U	522±7.5 ⁽⁴⁾	522±5.5	528±15	--	579±6.2	1050±17
U-235 (Wt.%)	0.8585	0.8652	0.8640	--	0.8550	1.191
Plutonium Isotopic Composition						
Mass Number						
238 (wt.%)	0.013	0.011	0.010	--	0.01	0.04
239 (wt.%)	94.37	94.37	94.32	--	93.68	89.31
240 (wt.%)	5.24	5.25	5.25		5.88	9.43
241 (wt.%)	0.37	0.35	0.38		0.41	1.16
242 (wt.%)	0.01	0.02	0.02		0.02	0.06
Plutonium Specific Activity						
(d/m/g)	1.598 x 10 ¹¹	1.594 x 10 ¹¹	1.591 x 10 ¹¹		1.625 x 10 ¹¹	1.840 x 10 ¹¹

(1) Mixture No. 1: Tubes 2068-B, 2069-B, 2168-B, and 2169-B.

(2) Mixture No. 2: 1965-C (16 pieces), 1466-C (5 pieces) and 2864-C (4 pieces).

(3) Dissolver solution batch #4, tube No. 2063-B, was contaminated with the heel of a previous charge (Chalk River material) and consequently not reported.

(4) Precision values at the 95% C.F.

234-5 DEVELOPMENT OPERATIONPreparation of Plutonium Trichloride

Over three kilograms of plutonium trichloride were prepared in support of the plutonium trichloride conversion program. Phosgene was the chlorinating agent for most of the work.

Plutonium dioxide was chlorinated with a mixture of hydrogen chloride and hydrogen in one run. The resulting powder appeared free of plutonium dioxide but was a little darker blue than the greenish-blue plutonium trichloride previously produced. Chloride analysis of the product showed a mixture of trichloride and oxychloride. The chlorination of 100 grams of oxide was first tried unsuccessfully at 450 C. When the temperature was increased to 550 C, the chlorination occurred slowly, as was expected--since the flow of hydrogen and hydrogen chloride was only 1 - 2 cc per second. Excess hydrogen chloride was readily absorbed in one caustic scrubber. Excess hydrogen was diluted with a large volume of air by use of an air jet on the off-gas line. This chlorination system was entirely free from by-products which plug off-gas lines.

Plutonium Trichloride Reduction

Both 700-gram and 1400-gram scale reductions have been made in nickel flame-sprayed magnesia crucibles. Optimum coating thickness has not been determined; however, an 1102 crucible with approximately 425 grams of nickel sprayed on the outer bottom half of the crucible was found satisfactory. Yields in the above reductions were 98 and 86 percent.

High purity metal was obtained from chloride reductions when the crucible did not fracture--but in preliminary tests when insufficient nickel coatings were used and crucible cracking occurred, 2000 - 5000 ppm nickel was found in the metal.

The hydration studies made in cooperation with HLO Analytical Laboratories have been completed. No difficulty was encountered in the reduction of plutonium trichloride kept for 260 hours at a relative humidity of 8.5 percent (dew point approximately -13 C). Chemical assay of the water of hydration after this interval averaged 0.54 weight percent with a reported standard deviation of ± 0.15 percent.

Recovery of Plutonium From Chloride Slag and Crucible

Work thus far indicates that a practical process for the removal of chloride, and the preparation of a feed suitable for solvent extraction recovery of plutonium could consist of the following steps: (a) charging; (b) refluxing with 60 percent nitric acid; (c) constant volume boildown to remove chloride; (d) filtration; and (e) nitric acid hydrofluoric acid treatment of the residue.

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In the charging operation, 13 M HNO_3 is added to the slag and crucible to provide 6 M HNO_3 in excess of the stoichiometric amount necessary to neutralize the magnesium oxide. Time for acid addition is one hour. Most of the plutonium dissolves during this period.

Refluxing is performed to dissolve the crucible fragments. Further work may show that a reflux period is unnecessary. Only 12 percent or less of the plutonium dissolves during this period, and it has been cut from the original four hours to less than two hours with no effect on plutonium recovery.

In the constant volume boildown, the solution is boiled rapidly (BP 121 C) and 13 M HNO_3 is added at a rate equal to the rate of distillation. Chloride removal is rapid. Feeds containing from 35 - 70 ppm chloride have been prepared. Time for this period is from three to six hours. The solution from the boildown step is diluted with an equal volume of water and filtered. The filtrate has the following composition:

H ⁺	= 3.5	M
Mg ⁺⁺	2.0	M
Cl ⁻	0.002	M
Ca ⁺⁺	0.20	M
NO ₃ ⁻	7.9	M
Pu	2.8	g/l

and contains from 86 - 89 percent of the plutonium charged. It may be used for solvent extraction feed without further treatment.

The resulting chloride-free insoluble siliceous residue which contains from 11 - 14 percent of the plutonium is finely divided and filters slowly. Out of 330 g of slag and crucible charged, 9.9 g of residue remained. This residue is treated further with nitric-hydrofluoric acid to dissolve the plutonium. The solution from this step is treated with aluminum nitrate and combined with the original filtrate.

A separate iodine removal step such as is now used has been eliminated. This will not lead to difficulties due to plugging of off-gas lines. However, the formation of iodine in the reflux condenser and its crystallization from a brown viscous liquid collected from an off-gas line was observed during two "cold" runs.

Some work has been done on a process involving the precipitation of plutonium as its polymeric hydroxide away from the bulk of the dissolved salts. A "hot" run in which a volume reduction boildown was carried out indicates that the resulting slag and crucible solution will have a low enough plutonium concentration to be discarded (>0.005 g/l). The resulting chloride-free residue could then be treated with nitric-hydrofluoric acid and a small volume feed suitable for solvent extraction prepared. The pH necessary for precipitation is obtained by distilling until the bottoms consist of a molten salt, and then diluting with water back to a stable solution. A pH

of two has been obtained, in a "cold" run, by this method.

Continuous Task III

Assembly of the apparatus in Hood 31 for the study of continuous electro-deposition of plutonium from a molten chloride system is continuing. The apparatus will be ready for operation when the dry, inert atmosphere system is functioning.

The cell and its associated equipment is enclosed in a quartz and Pyrex pipe envelope to protect the cell atmosphere and to insure a critically safe array. Feed introduction and product removal will be made intermittently through valved chambers acting as interlocks to preserve the cell atmosphere. The cell atmosphere will consist primarily of hydrogen chloride, resulting from reaction of the by-product chlorine and introduced hydrogen. The off-gas will be continuously routed to scrubbers and disposal facilities in an adjacent hood.

The cell has as large a diameter as criticality considerations will allow, 1-3/4 inches. The study of materials for construction of the cell is still under way, but calls of several materials are available for the initial runs. Included are graphite, magnesium oxide coated with nickel on the outside, and zirconia.

The reduction cell and an associated vent tube provide a symmetrical means of damming the lower density melt and permitting the heavy product metal to overflow through a bottom outlet. Cylindrical electrodes are provided; a molybdenum cathode is mounted around the vent tube, and a graphite anode is positioned just inside the cell wall.

Plutonium trichloride will be fed into a melt composed of alkaline and alkaline earth chlorides maintained at 700 C. The cell is heated as necessary by an induction heating coil outside the envelope.

In addition to a 500 ampere DC source and a 7.5 KW inductive heating unit, a vacuum pump is provided for outgassing the equipment and melts. The equipment is sized for a rate of 100 grams of plutonium per hour.

Cell Material For Electrolytic Studies

A dense thoria, a recrystallized alumina, and a stabilized zirconia crucible were tested with a mixture of plutonium metal, a $\text{BaCl}_2\text{-NaCl-KCl}$ melt, and plutonium(III) chloride under an argon atmosphere at 800 C for 3-1/2 hours. The alumina crucible showed no evidence of attack. The zirconia and thoria crucibles also retained the melt but the walls of both crucibles were penetrated by the melt. The penetration of the zirconia was almost complete and about one-eighth of the wall thickness of the thoria crucible was penetrated.

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DECLASSIFIEDRecuplex Assistance

After the last solvent extraction cleanout, serious Recuplex column flooding has occurred. To help determine the cause, disengaging times were determined with the operating Recuplex organic and freshly prepared organic. These phases were contacted with sump material, floor cleanup material, and some freshly prepared SCF now being processed. Emulsification and long disengaging times (over eight minutes) were encountered with the D-9 material. Dilution of the feed was found to help, and addition of a proprietary deemulsifying talc, "Mistron 28", obtained from the Chemical Research Operation HLO, completely overcame the difficulty. Floor cleanup material, when filtered, was found to offer no difficulties.

Plutonium Dioxide Shipment

A 150-gram sample of plutonium dioxide was prepared and shipped to the Monsanto Chemical Company's Mounds Laboratory. The product contained 88 percent plutonium, 1400 ppm metallic impurities, and was less than 400 mesh particle size.

Oxide Reduction

An attempt at reducing cerium(IV) oxide with calcium in $\text{CaF}_2\text{-CaCl}_2$ (19.5 mole percent CaF_2) eutectic produced fine particles of cerium metal. Their presence was determined by dissolving the slag in water and then in nitric acid. The acid dissolution produced hydrogen and a yellow solution. Another reduction with partially chlorinated (approximately one-half) cerium(IV) oxide using the same reactants as before produced a thin layer of cerium metal near the bottom of the slag.

Neptunium Recovery

The 315 grams of neptunium received from Chemical Research Operation have been processed through precipitation as oxalate and calcination to oxide. The first batch was prereduced with peroxide and precipitated continuously, while the second batch was not prereduced and was precipitated batchwise. Both precipitations were at room temperature. There was no apparent difference in filtration performance and both supernatants precipitated further on standing, even though the batch slurry was allowed to stand overnight before filtering. The supernatants were refiltered and then neutralized to recover the remaining neptunium as hydroxide. This will be filtered, redissolved, and then reprecipitated as oxalate and calcined to oxide.

The neptunium oxalate was calcined at 600 - 650 C for three to four hours, resulting in a fine black powder. The bulk density of the first batch was 2.7 g/cm^3 . Samples of the oxide have been taken for spectrographic analysis, determination of percent neptunium, and completeness of calcination.

The dose rate from this material did not change during the first two days after ion exchange processing, but for the next several days it increased

approximately 200 mm/hr each day at the container surface.

Final analysis of the neptunium oxide shipped on September 5 showed a total of 282 grams as neptunium. One sample indicated a real density of 9.7. Plutonium content was well below 0.1 percent and metallic impurities were less than 200 ppm.

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ORGANIZATION AND PERSONNEL

Personnel

K. V. Seyfrit transferred to Product and Material Handling Operation, Purex Operation on August 1, 1958.

L. F. Lust transferred from Chemical Research and Development Operation to 234-5 Development Operation for a six month training period, effective August 11, 1958.

L. E. Brownell completed his summer assignment with the Advance Process Development Operation on August 29, 1958.

Trips

E. R. Irish, Manager Purex Technology Operation attended a meeting in Washington, D.C. on August 13, 1958 with Mr. Ed Miller and committee of the Atomic Energy Commission to discuss the separations processes.

B. F. Judson, Advance Process Development Operation visited Mr. Ed Miller, Atomic Energy Commission, Washington, D.C. on August 20 and 21 to discuss Fission Product Market Survey. Mr. Judson also visited Mr. E. Philleo and Mr. J. W. Ranftl of the General Electric Company, X-Ray Department, Milwaukee, Wisconsin on August 22 to discuss Fission Product Market Survey.

A. E. Smith, Finished Products Technology Operation visited Mr. Marvin Martin, UCRL, Livermore, California on August 11; visited Mr. Wayne Fisher, Albuquerque Operations Office on August 12; visited Mr. M. F. Roy of Los Alamos Scientific Laboratory on August 13; visited Mr. E. J. Walko of Dow Chemical Company, Rocky Flats, Colorado on August 14 and 15, 1958 to obtain information to base the HAPO development program on and information that will support the 3.5×10^6 dollar FY 1959 construction program.

Visitors

Warren Wade of UCRL, Livermore, California visited H. H. Hopkins, Jr. on August 19 to discuss design gloved hoods for button line at UCRL. Mr. Wade also visited A. E. Smith to gather information on button line to support the UCRL plutonium installation.

M. P. Kelly and L. P. Corbin of the Oak Ridge National Laboratory visited J. P. Duckworth on August 22 for a tour of the Purex Plant.

Wayne Cottingham of the Norelco Company, Seattle, Washington visited A. E. Smith on August 25 for consultation on 300 KV X-Ray machine operation.

Clyde Vogler of Argonne National Laboratory visited M. K. Harmon on August 1 to discuss surface decontamination.

Research and Engineering

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Inventions

None

R. E. Smith, Acting Manager
Research and Engineering Operation

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[REDACTED]

EMPLOYEE RELATIONS OPERATION
MONTHLY REPORT -- AUGUST 1958

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I. RESPONSIBILITY

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

II. ACHIEVEMENT

FIRE PROTECTION OPERATION

A. Fire Responses

A total of nine fire responses were made during the month with a loss of \$235.00.

Five of these were false or accidental alarms. One at 202-S was caused by electricians installing auxiliary alarm box, and four at 2101-M due to installation of sprinkler systems. No loss.

B. Fire Extinguisher Service 200 East, 200 West, Batch Plant, 200 North, B.Y. Telephone Exchange, and Yakima Barricade.

1. During the month 325 fire extinguishers were inspected, two installed, two delivered to new location, 12 seals broken and not reported, 25 serviced, and 200 weighed.
2. Twenty-four gas masks were inspected and five serviced.
3. Eighteen hand lines were inspected.
4. Sprinkler systems in 272-E, 272-W, 277-U, and 277-W were inspected.

C. Services Performed for Other Operations

1. Standby at 2101-M building for two hours while welding on sprinkler system.
2. Burned down building which was contaminated at "B" Area tank farm north of "B" Area.
3. Washed down road to remove contamination at Redox.
4. Assisted in acceptance test of sprinkler system at 2101-M and sealed all systems after test was completed.

D. Training of Personnel in Other Operations

1. Fourteen people attended a class on artificial respiration at 202-S building.

E. Training of Fire Protection Personnel

1. Three non-exempt personnel attended personnel development classes at 224-B building in 200-E Area.

F. Civil Defense Rescue Training

1. Classes were held each Friday during the month in rescue training at the 2101-M building at 200-E Area.

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UNION RELATIONS OPERATION

Fifteen grievances were filed at Step I during August, two of which were answered satisfactorily. Ten grievances were processed at Step II.

Neither the Company nor the Union had made request for appointment of an arbitrator in connection with the G. M. Brown grievance within the five day time limit stipulated in the Contract. (Transfer of an employee to a shop location by management in alleged disregard of the transfer request of another employee for the same location.) A discussion was held with HAMTC representatives in which alternative action was proposed which would have resulted in transfer of the aggrieved welder to the East Area shops.

The Operation study of all CPD grievances submitted since September, 1956 has been completed and the data obtained is currently being analyzed.

The J. Graham arbitration case is scheduled to be heard on September 8. Orville Olson, Pasco attorney, has been retained to represent the Company. The Operation has assisted Company counsel in preparation for the hearing. The case is concerned with the Company's placing ten to twelve employees in the 200-West shops on a straight swing shift (3:48 p.m. to 12:18 a.m.) for a period of thirty days. The Union claims that the shift was instituted unilaterally by the Company, an action which is alleged to be in violation of Article VII, Paragraph 6, of the HAMTC-GE Agreement.

During the month the unions have shown renewed interest in the question of work assignments to Minor Construction forces. The union presented the Company with a list of jobs performed by Minor Construction forces with a demand for explanation as to why the work was so assigned and what considerations, Davis-Bacon wise, prompted the decisions to be made as they were. Each instance was studied. This review indicated that the work in some cases was assigned in accordance with AEC directives, while in others, lack of sufficient manpower or certain budget considerations were controlling factors.

UNION RELATIONS OPERATION

	<u>August</u>	<u>July</u>
Bargaining Unit Employees in CPD	813	819
Bargaining Unit Employees Utilizing Check-off	570	571
Percentage of Total Bargaining Unit Employees Utilizing Check-off	70.1	69.7

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

	<u>Unit</u>	<u>Nonunit</u>
Grievances received year to date	110	1
Grievances pending at Step II on 7-31-58	13	0
Grievances received during the month	15	0
Satisfactorily answered at Step I	2	0
Settled at Step I through expiration of 90-day time limit	4	0
Processed at Step II	10	0
Pending at Step II on 8-31-58	12	0
Pending at arbitration		
Active	5	0
Inactive	7	0

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COMMUNICATION

A. Statistics

GE NEWS items	10
General Manager's meetings with exempt employees	0
Management News Bulletins	5
Employee Headliners	3
Employee Location Records mailed out	18
Priority Messages	1
Round Table questions sent out for answer	3

B. Comments on Statistics

Ten items from CPD were carried in the GE NEWS during the month. These included a full-page feature on CPD suggestion award winners; a suggestion award story; a retirement picture and outline; an obituary; two service award stories; an attendance award story; a picture and outline of a Purex group who had achieved another year without a minor injury; a picture and outline of the boiler removal at the 200-W power house; and a picture, outline and story on the safety quiz contest.

A priority message concerning an IPD disabling injury was sent out during the month.

C. Other Employee Communication Activities

An Upward Communication Report was prepared for the Employee Relations Manager.

Material that was originally prepared as a letter to the homes concerning the Redox layoffs was revised and put into a form for distribution to Level 3 and 4 managers. A news release on the layoffs, prepared by Press Relations, was reviewed and approved, and a copy of the release was called to the various HAPO Employee Relations managers and their Communication Specialists.

During the month Communication provided editing service for:

The Specialist -- Employee Benefits, concerning a letter to all first-line supervisors discussing the new suggestion form.

The Manager -- Health & Safety, for an article on the potential fire hazards of plexiglass, and a letter for distribution to all employees concerning the safety quiz contest.

Arrangements were made for a safety quiz contest packet to be sent to the homes of all CPD employees.

The "Nuclear Science Abstracts" distribution list was brought up to date at the request of the Technical Library.

C. Other Employee Communication Activities - Cont'd.

Sufficient copies of a booklet, "A Special Buyer's Guide for General Electric Share Owners," were distributed to each HAP0 Level 2 operation with a suggested tip-on. The booklet was distributed with paychecks to all CPD employees as part of the OPERATION UPTURN campaign.

D. Public Communication

Considerable time was spent during the month encouraging the various CPD components to contribute material for the GE REVIEW's annual Research and Engineering Progress issue, and in editing the material turned in by CPD authors. Items were to be submitted to R&U for final selection and editing on September 2.

Arrangements were made for a photographer from TIME magazine to take several pictures of CPD activities for use in a forthcoming TIME feature on the atomic energy program.

Arrangements have been made with the Supervisor, Power Engineering, P&GM, to prepare a signed article on air filters, for submission to an appropriate trade journal.

The oral presentation to be delivered at the Geneva Conference by the Manager -- Research & Engineering, was reviewed at his request.

A CPD roundup talk, written by the Manager -- Purex, for use in the HAP0 Speakers Bureau, was reviewed and edited.

Information concerning the failure of the emergency generator in the 200-W Power House was provided Press Relations, R&U.

The new form for requesting service in arranging plant tours and visitations, prepared by R&U, was sent to each level 3 manager with an explanatory letter.

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	<u>August</u>	<u>July</u>	<u>Year to Date</u>
Disabling Injuries	0	0	0
Serious Accidents	3	2	8
Medical Treatment Injuries	34	40	360
Overexposure Incidents	1	0	4
Potential Overexposure Incidents	0	2	4
Radiation Occurrences	30	26*	196
Fires	3	2	15
Security Violations	0	2	9

*Corrected value

There was one case of a localized technical skin overexposure from sitting on a pair of contaminated gloves in a truck cab.

Programs

A Department safety program, Safety Quiz, was developed with the Safety Program Council. Contest rules, the first quiz, and a Home Safety Check List were mailed to the homes of all CPD people.

In response to interest by the Commission, Posters and photograph reference numbers used in the Department's Personal Protection Equipment program were provided for probable display at the National Safety Congress.

Interest in the Safety Detector has increased. The device has been loaned to other departments for use in safety meetings.

First drafts of CPD Radiation Protection Standards were completed except on subjects where changes are expected in the HAPO Standards.

Bumper stickers "Drive Carefully" and Richland Safety Council calendars were secured and distributed.

Ten messages were posted on the marquee boards.

Training and Education

Preparation of a Department safety meeting guide, "Unaccustomed As I Am To Safety Meetings," was completed for distribution to all exempt CPD people.

Advice and Counsel

- Redox - Hexone Tank Car Unloading-car not equipped with a shut-off valve on bottom of tank; location of oil drum storage facility for 202-S; installation of sprinkler system for paint storage facility in 202-S; recommended a relay in the spray booth sprinkler alarm system; recommended procedures for controlled burning in the U Area tank farm.

- Purex - Chemical storage arrangement; emergency exit from the SWP change room at east end of auxiliary crane location; checked trap pit No. 2 for oxygen efficiency and 216 pit for offensive odor-rec-ommended 216 pit be ventilated with coppus blower and assault mask be used; improved steps on UNH tank trucks to permit easier access to valves and hookup connections and eliminate walking on top of tanks.

- P & GM - Repair of roads, and pavement at shuttle bus unloading and loading spots in 200 East Area; sketches for extension of sprinkler systems to the compressor room, 277-W and the T.S. machine shop, 272-W were approved; dismantling of #5 boiler at 200-W Powerhouse; correction of the 284-E railroad car puller cable tripping hazard; program for quarterly inspection of lay-away facilities.

- Facilities Engineering - Use of fire resistant filters in the new auxiliary crane at 202-A canyon; review and comment on the 200 Area fire and sanitary water study report; progress of the engineering study for additional fire protection for 234-5; improvement of water supply to Z Plant; poten-tial hazards in digging shafts in the tank farms to determine leakage.

- Employee Relations - Ozalid machine ventilation system changes; new product for clean-ing duplicating machines, duplicating room, 271-B.

- HLO - Audit of Exposure Report Cards; radiation protection training programs.

Inspection, Investigation and Audit

- A scaffold arrangement in 224-UA Building was inspected; the scaffold was removed.

- A survey was made of the effectiveness of the mosquito abatement program within the 200 East and West Areas. Limited control measures have been effective.

- Inspections were made of 202-S and 222-S acid storage and cylinder gas manifolds.

- Investigated an incident involving the oxidation of product in a 234-5 production line hood.

- Investigated a fire in 202-A Lab and in 269-WTC steam generator shack.

- Investigated Serious Accidents CPD 58-5, 58-6, and 58-7.

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Inspection, Investigation and Audit (cont.)

Redox follow-up audit is in progress.
The follow-up audit of 234-5 Building was completed.
Evacuation and Rescue audit was completed.

Reports Issued

CPD Radiation Occurrences for July
Technical Overexposure CPD 58-4
Serious Accidents CPD 58-5, 58-6, and 58-7
222-A Lab Fire Report
Accident Prevention Council Meeting Minutes
Health, Safety and Security Performance Report

EMPLOYEE COMPENSATION OPERATION

Six position audits were completed, two of which were made in conjunction with revaluations.

Study and analysis of four current reorganization efforts which are in various stages of development, one of them major in size, was completed with recommendations made to appropriate managers.

Five reconciliations of positions were completed against counterpart positions in other HAPO Departments.

Revaluation of an established position was authorized following normal audit, reconciliation and evaluation completion.

Two secretarial jobs were reviewed for merit promotions during the month and warranted promotional action accomplished. Two clerical jobs were reviewed. One of these was in the Financial organization and resulted in determination that no change was necessary at this time. The other job was reviewed as the result of its elimination by P&GM to determine what had happened to the duties the job had contained for the purpose of answering a grievance by the former incumbent.

A detailed review of the Process Crane Operator's duties was made to determine whether or not the established grade and pay level are adequate for the duties presently required. It was concluded that the grade and pay level are adequate and proper.

The fabrication work performed by Process Operators in 234-5 was reviewed to determine whether or not performance of the work by personnel in the classification was proper and whether the grade and pay level were sufficient for the work. It was determined that both performance by Process Operators and their pay levels were proper for the work.

A detailed investigation and study from a wage standpoint was made to ascertain the best method to provide luncheon coverage for the Chief Power Operator in the 200 West Area Power House, conforming to an arbitration decision on the subject and at the same time not violating established wage principles. The conclusion reached was to utilize a relief journeyman and locate such journeyman at this Power House.

Round table information on the status of the nonexempt wage study was provided during the month.

Information on CPD personnel for the N.W. Annual Wage Survey was compiled and forwarded to J. J. Tegen.

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SUGGESTION PLAN

	<u>July</u>	<u>August</u>
Suggestions Received	69	52
Acknowledgements to Suggesters	70	55
Suggestions Pending Acknowledgement	3	0
Suggestions Referred to Operations for Investigation	70	55
Suggestions Pending Referral to Operations	3	0
Suggestions Completed and Closed	52	68
Adopted Suggestions Approved by Board	26	30
Adopted Suggestions Pending Approval by Board	23	21
Total Net Tangible Savings	\$600.93	\$4002.41
Cash Awards Paid During Month	\$270.00	\$ 535.00

As of the end of August \$4,275.00 has been paid in awards in 1958 with total Net Tangible Savings of \$35,720.34. The average award of the 249 adopted suggestions is \$17.70 (below criteria of \$27.27) and the ratio of awards to savings is 12% (below criteria of 16.1%).

	<u>July</u>	<u>August</u>
Total Number of Suggestions Outstanding to Operations at the End of the Month	125	111

Participation in Benefit Plans

	<u>July</u>	<u>August</u>
Insurance Plan	99.7	99.8
Pension Plan	99.3	99.4
Stock Bonus Plan	61.3	61.2
Good Neighbor Fund	61.5	61.0

One employee, T. L. Jernigan, who has been out on illness absence for approximately one year, retired on optional retirement effective September 1.

PERSONNEL DEVELOPMENT AND PLACEMENTA. Employment

	<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	1	1
Re-Engages	0	0	0
Transfers from other components	1	6	7
<u>Removals</u>	2	19	21
ROF	0	0	0
Illness	0	5	5
Leave of Absence	0	2	2
Deceased	0	1	1
Transfers to other components	0	8	8
Resigned	2	3	5
<u>Requisitions (Non-Exempt)</u>			
Number on hand at beginning of month		8	
Number received during month		14	
Number filled		15	
Number on hand at close of month		7	
<u>Request for Transfer (Exempt)</u>			
Number on hand at beginning of month	15		
Number received during month	1		
Number transferred	0		
Number closed out	3		
Number on hand at close of month	13		
<u>Applications for Employment (Exempt)</u>			
Applications received during the month	0		
Hired	0		
Closed out	0		
Applications on hand at close of month	0		
Open Requisitions	2		

Service Pins

A total of 10 pins were issued as follows:

10 yrs. service	10 Male	0 Female
5 yrs. service	0 Male	0 Female

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CPD declared five excess people during August consisting of: 1 Coal Leader, 2 Coal Handlers, 1 Serviceman, and 1 Spare Equipment Coordinator. These cases were resolved by downgrading the Coal Leader to a Miscellaneous Operator and transferring him to IPD who in turn ROF'd a Miscellaneous Operator. The two Coal Handlers were transferred to FPD to fill existing openings for one Motor Messenger and one Janitor. The Serviceman transferred to an opening for one Serviceman in Relations and Utilities Operation. The Spare Equipment Coordinator exercised his "bumping rights and displaced a junior Spare Equipment Coordinator in IPD.

Requirements for permanent placement of technical graduates for FY 1960 were submitted to the Manager, Technical Recruiting, HLO. The total requirements are for five people to be added to the Department.

Status - Personnel Development Program for Non-Exempt Employees

<u>Month</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>Total</u>
Number of appraisals scheduled	99	64	90	324
Number of appraisals delinquent 8-31-58	6	10	60	80

Correspondence

During August a total of 54 inquiries regarding CPD personnel were answered. They consisted of:

- 2 Letters of inquiry regarding credit
- 52 Letters regarding housing loans

Military Service Records

Records show that CPD has a total of 126 employees who are subject to military training through Selective Service or Armed Forces Reserve action.

	<u>Exempt</u>	<u>Non-Exempt</u>
Ready Reserve	12	13
Standby Reserve	15	6
Deferments Requested		0
Deferments Granted		0
Deferment Requests Pending		3

B. Personnel Training and Development

Participation in Training Courses

Exempt	26
Non-Exempt	56
G. E. Supervisory Selection Program - No. Completed	1
G. E. Supervisory Selection Program - Revaluation	2
Technical Graduates on Rotation	2
Employees counseled in self-development	2
OPG's Issued (11 revised)	11

Three new groups (54 people) started PEM on August 26.

C. Office Services

Duplicating

Total Multilith Copies Produced	148,340
Ozomatic Copies Produced	12,035
Verifax Copies Produced	782
Xerox Masters Produced	247

Mail

Total Pieces of Mail Handled	55,440
Registered Deliveries	425
Library Mail, Pounds	468
Blue Prints, Pounds	232

Addressograph

Instrument Charts Imprinted	8,620
Bulletins, OPG's, Etc.	8,298

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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

CPD Operation Upturn Council

Meeting of Communication Specialists which was held to discuss the next portion of OPERATION UPTURN, which is technical competence.

Meeting with the Communication Specialists which was held to meet and talk with a consultant from the Company's research group out of New York. Purpose of the meeting was to talk over initial plans for communication research activities at Hanford.

Industrial Relations Council meetings

Pre-grievance and Step II meetings

Employee Relations Task Force meetings

Tri-City Safety Council

HAPO Radiation Protection information meeting

Showing of "See It Now" presentation on Fallout

Fire Prevention Committee Meeting of the Chamber of Commerce

Meeting with representatives of the University of Washington, Richland Adult Evening School, Columbia Basin College, and the Pasco Adult Evening School. Arrangements were made for HAPO to publicize the courses offered.

B. Personnel Activities

Fire Protection Operation held 57 inside classes, and 62 outside drills, in which 6,420 feet of hose and 578 feet of ladders were used. There were 730 hours spent in training, which amounted to 11.7 percent of the time worked.

Captain P. P. Perkins attended the 19th Annual State Fire School for the State of Montana, where he gave a speech entitled "Fire Protection in Atomic Industry".

C. Safety and Security

The Operation had no medical treatment injuries or security violations during the month.

D. S. Roberts, Manager
Employee Relations

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