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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

DE93 007071

By Authority of CG-PR-2
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JUNE 1963

Compiled By
OPERATION MANAGERS

July 22, 1963

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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I. SUMMARY

Production through June, as compared with the April 29, 1963 HAPO Production Forecast (HW-77320), is summarized below:

	<u>Percent of Forecast Achieved</u>	
	<u>June</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	119.5	100.8
Separated uranium nitrate	120.7	99.4
Uranium oxide	106.6	98.5
Plutonium metal buttons	128.5	100.0
Fabricated parts	52.9	98.3

June production of separated plutonium and separated uranium not only exceeded forecasted quantities but also established new record highs for both products. The output of uranium oxide and plutonium metal buttons also exceeded forecasted quantities. The low production of fabricated parts during June, as well as May, resulted from a reduction in delivery requirements by the AEC.

Except for a four-hour shutdown to repair a demineralized water line, the Purex plant operated continuously throughout June. All plutonium product met specifications; however, approximately twenty tons of uranium product will require rework to reduce the plutonium content.

The HAPO II-1 cask, containing about 1000 thermal watts of strontium-90, was released for shipment on June 13.

Three series of strontium recovery runs were completed in Purex head end equipment. The last series was processed as the initial strontium rare-earth fraction to be used for B Plant feed.

Following a survey by representatives of the Quality Assurance Agency from the Department of Military Application's Albuquerque Office, a rating of "satisfactory" was awarded to Hanford's Weapons Quality Control program for Model 1807 parts. Upon compliance with several recommendations made by the group, Hanford will deliver certified components not requiring re-inspection at the customer's plant.

The construction contract for Project CAC-964, "Equipment Disposal-Purex," was awarded to Peter Kiewit and Sons, Inc. on their low bid of \$689,000. The contractor arrived on-site on June 24 and has 300 days to complete the work.

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An engineering study was completed for a special plutonium preparation facility, to be located in Room No. 179-B of the 234-5 Building. The study recommended that plans should proceed as rapidly as possible to develop the facility.

The rough draft portions of the final report on scope of the Hanford Isotope Plant (HIP) were completed in early June. Total operating and unit costs, for six additional unclassified production cases, were completed by June 18. A flowsheet and capital cost estimate were developed for including CSREX fractionization of Purex Acid Waste in HIP.

Two disabling injuries were experienced in the Chemical Processing Department during June. The first occurred when an employee fell and incurred a chip fracture of the first lumbar vertebra. The second injury resulted from an employee's left index finger being pinched while connecting a trailer to a towing vehicle.

P. H. Leinker

General Manager
Chemical Processing Department

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. Percent of Forecast⁽¹⁾ Achieved

	<u>June</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	119.5	100.8
Separated uranium nitrate	120.7	99.4
Uranium oxide	106.6	98.5
Plutonium metal buttons	128.5	100.0
Fabricated parts	52.9	98.3

b. Purex

	<u>June</u>	<u>May</u>
Uranium nitrate produced (tons)	773.90	669.07
Average production rate during operation (T/D)	26.2	30.8
Total waste loss (%)		
Plutonium	0.33	0.34
Uranium	0.22	0.36
On-line efficiency (%)	98.43	76.9

c. Redox

Uranium nitrate produced (tons)	131.22	35.03
Average production rate during operation (T/D)	6.9	8.2
Total waste loss (%)		
Plutonium	0.34	0.29
Uranium	0.24	0.29
On-line efficiency (%)	64	18

d. Uranium Reduction (tons)

Normal UO ₃ loaded	667	472
Enriched UO ₃ loaded	115	106
Normal UO ₃ approved for shipment	593.00	540.58
Enriched UO ₃ approved for shipment	100.10	150.82
Normal UO ₃ shipped	494.03	441.40
Enriched UO ₃ shipped	100.33	100.55
Normal UNH backlog	420	308
Enriched UNH backlog	31	16

(1) HW-77320, HAPO PRODUCTION FORECAST, dated 4/29/63

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e. Plutonium Metal Processing

	<u>June</u>	<u>May</u>
Reduction yield (%)	98.42	98.50
Product recovery output (Kgs)	76	128
Product recovery backlog (Kgs)	1216	1202
Waste disposal (grams)	326	272

f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	12,194	5,027
Filtered water pumped (GPM)	1,292	1,170
Maximum steam generated (lbs./hr.)	220,000	110,000
Average steam generated (lbs./hr.)	206,000	92,000
Total steam generated (M lbs.)	146,274	55,962
Coal consumed (tons)	7,387	2,871

June production of separated plutonium and separated uranium not only exceeded forecasted quantities but also established new record highs for both products. The output of uranium oxide and plutonium metal buttons also exceeded forecasted quantities. The low production of fabricated parts during June, as well as May, resulted from a reduction in delivery requirements by the AEC.

R.E. Smith
for Manager, Production

2. FISSION PRODUCT DATA

	<u>PUREX*</u> <u>RECOVERY</u>	<u>244-CR*</u> <u>INVENTORY</u>	<u>B-CANYON*</u> <u>INVENTORY</u>	<u>SEMIWORKS</u> <u>PRODUCTION</u>	<u>PRODUCT</u> <u>INVENTORY</u>	<u>PRODUCT</u> <u>IN CASK</u>	<u>PRODUCT</u> <u>SHIPPED</u>	<u>CUSTOMER</u> <u>REMARKS</u>
Sr-90 (Kilocuries)	200	1090	-	-	2070	470	160	ORNL HAP0 II-1 Cask 6-14-63
Cs-137 (Kilocuries)								
Ce-144 (Kilocuries)								

*Estimated figures based on Cs. calculations

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II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The Purex plant operated continuously throughout the month except for a four-hour shutdown to repair a demineralized water line.

All plutonium product met specification, but approximately twenty-one tons of uranium produced will require rework through the final uranium cycle to remove above-limit plutonium impurity.

2. Processing Operation

The Neptunium Purification Facility (Q Cell) continued to receive hot feed and two regular runs were successfully processed.

The HAPO II-1 cask, loaded in May with 160,000 curies of Sr-90, was shipped to ORNL on 6-13-63 while the HAPO I-B-1 cask, loaded last December with 470,000 curies of Sr-90, remains in the shipping buffer awaiting AEC approval for shipment.

Three series of strontium recovery runs were completed in Purex head end. The last series was processed as the initial strontium-rare earth fraction to be used for B Plant feed.

Strontium Semiworks completed the Research and Development run started in May for cerium separation from the rare earths. A second test run was completed which resulted in 88 percent extraction of cerium and 90 percent of the promethium recovered.

Sludge testing with lance penetration was completed in 101-A and 102-A waste storage tanks and confirmed the ability to penetrate the sludge with hot water at low pressures.

3. Mechanical Experience

1. Failure of an outlet tee on a demineralized water line caused a crash shutdown of the plant 6-30-63 for emergency repairs.
2. F-7 pump (acid waste feed to formaldehyde reaction tank) failed and was replaced without a process shutdown.
3. The line from 003-CR vault to B Plant was hydrostatically tested and found in satisfactory condition.

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4. A modified 40" centrifuge was installed in E-4 spot for Purex head end processing.
5. Minor Construction completed welding pipe trench lines in 221-B and plant forces completed regasketing of associated cell jumpers.
6. Excessive inleakage in the B Plant vessel vent system and instrument work on the Ring Balance recorders has delayed startup beyond the end of the month. Leak checking and corrective work have been started.
7. Inspection of the 40-ton hoist cable on the west crane revealed damage and the cable was replaced.
8. The #1 Purex canyon exhaust fan failed due to bearing trouble. The fan was completely overhauled and returned to service.
9. Partition changes have been made in the control laboratory to accommodate the equipping of Hot Laboratory #5.

4. Radiation Experience

The total iodine 131 emission for the month was 9.32 curies. Maximum seven-day emission was 3.62 curies.

P. H. Munn
Manager-Purex

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II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

Effective June 3, the Redox plant went from a five to a seven-day-per-week operating schedule. The additional manpower was obtained from the Weapons Manufacturing Operation and from Redox personnel on overtime as needed. Process difficulties limited operating time to approximately 65 per cent, and the anticipated production was not achieved despite the extra effort.

The Uranium Oxide plant operated at satisfactory rates throughout the month, and the production and shipment of both depleted and enriched uranium were satisfactory.

2. Processing Operations

a. Redox Processing

Processing of E-metal was started on 6-3-63 on a seven-day-per-week operating schedule. However, on 6-7-63 the D-14 backcycle feed pump failed, and when efforts to remove the pump from its base were unsuccessful, the alternate flow pattern used during the first quarter of 1963 was restored, by-passing D-14 once again. Processing of virgin feed was resumed on 6-11-63. Plant performance during the balance of the month was disrupted by other difficulties, however, and approximately seven more days were lost.

Neptunium stripping operations were resumed this month, and approximately 800 grams were being readied for shipment to the Purex plant at month end.

b. Uranium Oxide Processing

The production and shipment of both depleted and enriched uranium oxide met schedules for the month, despite curtailments caused by shortage of uranium feed and needed calciner repairs.

3. Mechanical Experience

a. Redox Plant

On 6-7-63 the D-14 backcycle feed pump failed, and all efforts to

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remove the pump from its base were unsuccessful because two of the hold-down nuts could not be removed from the tank studs. The problem is being solved by a redesign that allows a new D-14 pump and the tube bundle to be installed together in one of the vessel's heat exchanger pots.

b. Uranium Oxide Plant

The J-cell calciner was removed from service for three days during the first part of the month to remove caked UO_3 from the agitator blade and the calciner trough.

The G-cell depleted uranium calciner was shut down for twelve hours on 6-12-63 to allow replacement of the filter bags.

4. Waste Handling and Decontamination Operation

Equipment valued at approximately \$52,000 was received from the processing plants for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$19,000 was returned to customers, representing a savings of approximately \$11,000 over the cost of new equipment.

5. Radiation Experience

The radioactive iodine emission from the Redox plant showed an increase during the latter part of the month to a maximum of 0.9 curie per day. The remedial actions taken did not have the problem under complete control at month end.

The H-4 oxidizer became pressurized on 6-27-63 during the boiling of metal feed solution when the vessel vent capacity was exceeded. An alarm system was immediately installed on the H-4 pressure recorder to alert operating personnel to any future pressurizations in the system. Also, Facilities Engineering Operation started a study specifically of the H-4 problem, and will devise a method for pressure relief of all boil-up vessels in the cells.

6. Analytical Experience

The two new 400-channel analyzers, ordered from the Radiation Instrument Development Laboratory, were received this month. Initial checking of the instruments detected out-of-specification linearity. Corrections were made by the vendor, and at month end, checking and evaluation of instrument performance was again under way.

Manager - Redox

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II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

The fabrication of Model 1807 plutonium weapon components continued to be limited as directed by the latest AEC interplant delivery schedule. Development efforts on Model 74-C were continued. The production of unfabricated plutonium exceeded schedule by about thirty percent. Recovery activities included limited dissolution of skull material and other high-purity scrap, as well as continued efforts to clean out the Recuplex stripper-concentrator. The incinerator remained out of service during the month.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in Document HW-78150 (Atomic Weapon Data).

On June 10, 11 and 12, representatives of the Quality Assurance Agency of the Albuquerque Office of the Department of Military Application visited Hanford and conducted a survey of Weapons Quality Control activities related to Model 1807 assemblies. A rating of "satisfactory" was awarded contingent upon compliance with certain recommendations, making it possible for Hanford to deliver "certified" weapon components in the future.

b. Plutonium Processing

Button Line feed supply was good and operating rates were high during the month. Interruptions resulted from bed compaction of the ion exchange columns as well as the usual mechanical problems.

The backlog of fabrication scrap was eliminated during the month. Dissolution of other high purity scrap materials is in progress.

Work continued on the removal of the hard polymer of plutonium from the J-26-A vessel (Recuplex stripper-concentrator). Another portion of the tank was cut away to permit access to the contents. At month end, approximately 10 kilograms of plutonium have been removed from this vessel, with an estimated two kilograms remaining.

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b. Plutonium Processing (Continued)

All previously used resin from the ion exchange unit has been cleaned and eliminated from the plutonium inventory.

3. Mechanical Performance

The machining equipment employed in the manufacture of the Model 1807 functioned with only normal maintenance required during the month. The high-frequency generator for the 19-B induction furnace was successfully repaired in the 200-West Area motor shop.

The equipment for the production of Model 74-C functioned well with the principal difficulty involving the oxygen analyzer in the hood for the fifth Stokes furnace.

In Final Inspection, the million-volt x-ray equipment required extensive maintenance. It was necessary to employ the GE X-Ray Service Representative to diagnose a rectifier problem since access to the tube was required. Also the newly-installed Hadley density balance has been modified so that the use of correction factors is eliminated for regular operation.

Button line maintenance problems were involved as usual with the filters, the vacuum system and the pumps. The recently fabricated stainless steel reactor vessel was installed in place of the easily damaged glass one. A new automatic, non-syphoning valve was installed between the feed tank and the reactor of the continuous processing unit.

4. Radiation Experience

Radiation and contamination control statistics reveal a sharp improvement in performance.

The single Radiation Occurrence which was experienced involved a Chemical Analyst whose face was sprayed by a dilute solution of plutonium nitrate from a sample vial which had pressurized. All but a trace of the contamination was successfully removed by the end of the work day, and this remainder came off subsequently with the thin protective coating of plastic which had been applied. No plutonium deposition is expected to result from the incident.

The gamma radiation levels at Hood 7A (feed and filtration for ion exchange unit) was reduced 50 percent by the installation of lead glass shielding.

5. Analytical Experience

	May "C" Line	June "C" Line "A" Line	
Numbers of Samples Received	3,122	2,664	
Number of Determinations	21,732	17,933	
Total Impurities, Buttons (Average)	1,930 ppm	2,010 ppm	2,330 ppm
Buttons Rejected	2.4%	0.5%	7.4%
Pu ²⁴⁰ , Normal Buttons (by Neutron Count)	6.00%	6.08%	None
Pu ²⁴⁰ , Unclassified Buttons (by Neutron Count)	None	None	None

A procedure for the determination of Americium has been set up in support of research programs, and for eventual use for the new reclamation facility (Project CAC-880).

for Manager
Weapons Manufacturing

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II. ACHIEVEMENTS (Continued)

E. POWER AND CRAFTS OPERATION

1. Operating Continuity

There were no outages of steam, water or electrical services that affected continuity of operations of the production facilities during the period covered by this report.

2. Inspection, Maintenance and Repair

Fabrication and installation of the H-40F Finish and Polishing Hood for the Weapons Manufacturing Operation's RMA line was completed. Installation of the various utilities and services required for the new hood was in progress at month's end.

A newly designed insert cooling coil was fabricated for immediate use in the D-14 Backcycle Concentrator at Redox. The new design incorporated a bracket for mounting a pump which will be inserted through the center of the new coil. This was necessary due to difficulties encountered in attempting to remove the existing failed pump from its normal position. The new coil was rolled and assembled in accordance with new corrosion resistance welding specifications.

A large shielded cask, identified as the "C-1 Loop Discharge Cask" was fabricated for research and engineering studies in the 100 Areas. The cask will transport irradiated fuel elements between areas.

A titanium screw-type chlorinator was machined and assembled for development studies by Hanford Laboratories' Plutonium Chemistry Laboratory.

A spare H-4 Oxidizer coil was assembled and made ready for the Redox facility.

Installation of appurtenances and associated equipment for the Weapons Manufacturing Operation's fifth Stokes furnace was completed. Included were:

1. The oxygen analyzer for controlling the nitrogen atmosphere in the hood.
2. The hydraulic electrical and instrumentation systems for controlling the air lock, rams and diverter, and
3. The electrical systems for operation of the conveyers.

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Thirty cell-pipe jumpers, 18 for Redox, 12 for Purex, were fabricated during the month.

A small hood was fabricated and installed in Weapons Manufacturing Operation's inspection line for housing a Rockwell hardness tester.

A plutonium alloy pressing hood was installed in Hanford Laboratories 231-Z facility. The hood had been fabricated off-site and was tied-in to an existing hood by plant forces. Other work for 231-Z included fabrication of a large plutonium research hood, the installation of which is postponed pending a firm decision as to location.

Preliminary tests were conducted on the feeding of potassium permanganate to the sanitary water system in 200 East Area. These tests were made at various feed rates. Final results are not known at this time.

Capacity flow tests were conducted on the sanitary water main fire hydrants located around the 234-5 Building to determine if sanitary-water flow to this area was increased appreciably as a result of the recent installation of a 3000-gpm steam turbine pump in the 283-W Filter Plant. It is evident from these tests that line size to the 234-5 Area is the restricting factor to increased water flow.

Activities of the department's ventilation balance group performed in support of other departments included:

1. Preliminary work on air balance of the 105-N ventilation system.
2. Conducting acceptance test procedure on revised ventilation units in the 190-KE and KW Buildings. (Project CGL-383.)
3. Rebalance of the ventilation systems in the 1706-KE and KEF Buildings. (Project CGL-971.)

New pressed-wood tile floors (par-tile) were installed in the administration building, 200 East Area (2704-E). The work was done to upgrade the existing substandard floors to acceptable standards and to obtain lower maintenance costs.

Renovation of the entire second floor of the 27L-U Building, 200 West Area, was completed to provide office space for thirty-five Nuclear Material Operation's employees. The work was performed by Minor Construction forces. The space was occupied by the new tenants, June 29.

Manager
Power and Crafts Operation

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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

Purex Column Cartridge

New drawings were issued for the Purex HS and 2E column cartridges to correct the previously-failed cartridges. The new designs increase reliability of these units by improving structural rigidity.

b. Project Engineering

CAC-964 - Equipment Disposal - Purex

Construction bids from eight (8) bidders were opened on June 5. Bids ranged from \$689,000 to \$894,500, compared to a fair cost estimate of \$845,000. The Notice of Award and the Notice to Proceed were issued simultaneously to Peter Kiewit & Sons, Incorporated, on June 10. The contractor has moved on-site and has 300 days to complete the work.

CAC-981 - Fission Product Packaging Facility - Purex

Directive No. HW-548, Rev. No. 1, dated June 13, changed project management responsibility from the Company to ROO-AEC. W. A. CAC-981(1), dated June 27, authorized \$16,500 to the Company for technical guidance of design and other services. This is a reduction in General Electric authorization from the original \$350,000.

c. Manufacturing Engineering

UNH Transfer

The study of the methods and equipment used for the transfer of UNH solution from Purex to the UO₃ Plant has been completed and presented to Purex management.

It was found that the present system is adequate from a capacity standpoint for present and proposed rates of production. Slight modification of equipment and operating pro-

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cedure can yield a saving of \$12,000 per year based on present estimates of production. In addition to examining the present system, the possibilities of transfer by rail or pipeline were examined.

2. Redox

a. Project Engineering

CAC-101 - Redox-7-S Crib Replacement

Directive No. AEC-22, dated June 4, authorized \$110,000 for design and construction. W.A. CAC-101(1), dated June 7, authorized \$3,100 to the Company for technical guidance and other services. Design of the crib by Vitro Engineering Company was started on June 13, and will require approximately four (4) weeks for completion.

3. Weapons Manufacturing

a. Process Design Engineering

Special Plutonium Preparation Facility Study

An engineering study on a special plutonium preparation facility for the 234-5 Building was completed and issued. As a result of this study, it was concluded that Room No. 179-B is a better location for the facility than Room No. 148. It was recommended that plans to develop 179-B proceed as rapidly as possible. The total cost for the individual glove box was estimated at \$170,000.

RMA Fabrication Line

Designs were completed and approved for re-locating the dry atmosphere glove box on the RMA conveyor. This glove box will provide temporary facilities for developing a part-stabilization process.

An air-operated mold break-out device has been designed, built, and tested. It is ready for installation in HA-20MB.

The finishing and re-work glove box HA-40F, has been installed and is being connected to existing services. All design work is completed. All new tooling and work gages designed for the 74 Model have been built, and the new inspection optical comparator is on order.

RMC Fabrication Line

Design scope is being prepared for use by Vitro in performing

detail design. Tracings for detail design of the HC-30 Fabrication Oil Storage are ready for approval. Investigation of gasketing materials and methods for the air lock doors was continued.

Incinerator

The process incinerator is now being re-built. Detail design has been completed for re-routing the furnace flue gas line so the cold and hot streams join in a vertical section of pipe just prior to entering the off-gas scrubber. This change was made to eliminate the accumulation of solids in the horizontal pipe.

Conveyor-Inspection Area

The wearing of non-lubricated slats on the inspection area conveyor has caused the conveyor to move below the level of the sweep platform. This problem can be expected to extend into all conveyor systems; so plans are being made to set up a small section of conveyor for testing teflon tapes and lubricants.

b. Project Engineering

CGC-912 - Rev. #4 - Waste Treatment Facility - "Z" Plant

A project proposal revision requesting an additional \$158,000 to improve the nuclear safety of the facility (approved locally on June 6), was sent to Washington AEC for approval on June 27. Vitro has been asked to provide an estimate of design cost for the work outlined in the proposal.

CGC-983 - Plutonium Ingotting & Auxiliary Facilities - RMA Line - 234-5 Building

Glove Box HA-21I, ingotting facility, was placed in production on June 27. The project is 94.0 percent complete - 25.0 percent ahead of schedule. Glove Box HA-22B, density determining facility, is 99.0 percent complete. Acceptance testing is scheduled for July 1.

CAC-987 - Metal Stabilization Facility - 234-5 Building

Work Authority CAC-987(1), dated May 1, was received authorizing \$205,000 to the Company for procurement and technical guidance of the A-E. The specification for procurement of the 100,000 psi isostatic pressing system has been prepared and approved.

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c. Manufacturing EngineeringPower-roll Model

The new IBM-oriented forms were designed for the processes utilized in manufacturing and inspecting the 74-C Model - these are: (1) casting, (2) power-roll and machining, and (3) final inspection. The ingoting form has been designed and approved, and will be used as soon as the ingoting hood is completed.

4. Generala. Process Design EngineeringWaste Management Container Study

Temperature profiles and capacity curves have been developed for alternate fission product packages. Containers with bed thicknesses greater than 4 to 6 inches will require internal fin arrangements due to low conductivity of zeolite resins.

Hanford Isotope Plant

The rough draft portions of the final report were completed the first week of June. Total operating and unit costs for six additional unclassified production cases were completed by CPD Financial on June 18. A flowsheet and capital cost estimate were developed for including CSREX fractionization of Purex Acid Waste in HIP.

The estimate is 14.3 million dollars for purification and packaging; however 29.0 million dollars is estimated when including fractionization. The cost increase results from the need to expand the diameter from approximately 105 to 175 feet and to add a second floor AMU Gallery above the present operating gallery.

b. Project EngineeringProject Cost Information - as of 6/23/63:

Total Authorized Funds - 14 active projects	\$ 3 537 000
Total cost-to-date	2 736 000
Commitments and Open Work Releases	273 000
Unencumbered Balance	528 000
Costs Charged to Above Projects=5/19 to 6/23	182 000

Projects dropped from active status during current period:

<u>Project No.</u>	<u>Authorized Funds</u>	<u>Total Cost</u>
CGC-897	\$1 400 000	1 399 000
CAC-928	88 900	71 656
CGC-930	400 000	262 000

HP Shaw
Manager - Facilities Engineering

HP Shaw/alr

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering

(a) Feed Preparation

On June 3, a violent reaction occurred in the A3 dissolver when 50 per cent sodium hydroxide was added to a heel of bare uranium metal and a charge of aluminum-jacketed fuel elements. The reaction dislodged the charging chute cover and one and possibly two plugs in the off-gas system. After replacing the cover and plugs, the dissolver system was visually inspected for damage, checked for water leaks and returned to service with no evidence of major damage. There was no spread of contamination into the operating areas or outside the building. Laboratory dissolving studies and engineering pressure-impulse calculations by Hanford Laboratories personnel are underway to evaluate relative effects of pressurization by rapid gas evolution or an actual explosive reaction.

(b) Solvent Extraction

In-plant testing of hydrazine vice ferrous sulfamate as a plutonium reductant in the feed to the Second Uranium Cycle was suspended due to a shortage of hydrazine. Test results thus far indicate that:

- (1) The plutonium content of the uranium product can be reduced to the analytical detection limit (1 ppb) by concurrent addition of hydrazine to the ICU Concentrator and ferrous sulfamate to the 2DF.
- (2) Hydrazine alone at concentrations up to 0.05 M results in plutonium concentrations above specifications in the uranium product.
- (3) Second Uranium Cycle decontamination performance appears to decrease as the concentrations of hydrazine in the 2DF approach 0.05 M.

(c) Product Treatment

The second neptunium purification run was successfully completed in the new ion exchange unit. The final product was well within

all shipping specifications. Typical decontamination and waste loss performance data are as follows:

<u>Decontamination Factor</u>		<u>Waste Loss Per Cent of Feed</u>	
ZrNb	1300	Loading Step	0.91
Ru	630	Washes	0.21
U	50	Elution Forecut	2.2
Pu	Nondetectable in Feed		
TMI	60		

(d) Water Treatment

Treatment of the raw water with 1 ppm potassium permanganate before normal flocculation and demineralization was tested in the Water Treatment Plant. Although analytical data are not yet available, visual observations of the pink color indicated the permanganate was quickly destroyed by organics in the water. The system is intended to serve as a backup to permanganate treatment of the solvent for removal of organic materials affecting process performance in the Second Uranium Cycle.

(e) Acid Recovery

Variables affecting fission product entrainment in the high-level waste concentrator were studied with the following conclusions.

- (1) A flow of water to the second tray in the tower reduced entrainment by a factor of two.
- (2) A 15 per cent reduction in boilup rate did not affect the amount of entrainment.
- (3) Addition of 5 ppm of antifoam to the feed to the concentrator did not improve deentrainment.

(f) Fission Products

Plant-scale studies of ways to separate cerium from the rare earths by oxidizing cerium to Ce-IV and batch extracting with di(2-ethylhexyl) phosphoric acid (D2EHPA) were completed. The most promising oxidant was sodium bismuthate. Results of these studies can be summarized as follows:

<u>Oxidant</u>	<u>Aqueous Concentration</u>	<u>Contact Time</u>	<u>Per Cent Cerium Extracted</u>
NaBiO ₃	0.050	30	50
	0.075	75	80
	0.095	30	95
PbO ₂ -KMnO ₄	0.04-0.04	40	75

The cerium was easily stripped from the organic with 1.5 M nitric acid and 0.2 M hydrogen peroxide.

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2. Redox Process Engineering

a. Plutonium Anion Exchange

The L-18 Plutonium Anion Exchange Contactor was operated for most of the report period using a pulser to pump the resin. The pulser was developed by Chemical Development, Hanford Laboratories. It consisted of a diaphragm operated Teflon bellows pump attached to a tee in the contactor loop with ball checks above and below the tee to direct resin movement around the loop. By using the pulser to move the resin rather than pushwater, it is possible to reduce the amount of slip-water and thus achieve more column volumes of scrub with the same flow rate of scrub solution. A decontamination factor across the contactor as high as an arithmetic 6000 was observed. One problem encountered was that of air in-leakage collecting in the bellows which cushioned the pumping operation. The air had to be bled off frequently in order to keep the resin moving.

b. Iodine Retention

A new activated carbon filter was installed downstream from the sand-filter on 5-28-63. The radioactive iodine retention of this filter was less than 50 per cent instead of the anticipated 95 per cent (based upon sand-filter test data). This filter is one inch thick, contains 10 to 14 mesh coconut base activated carbon, has a cross section of 450 square feet, and handles a gas flow of approximately 33,000 cubic feet per minute. The building ventilation system and all of the process vessel vent systems except the dissolvers are handled by this filter.

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3. Plutonium Process Engineering Operation -

a. Button Line

The yield across the supernatant anion exchange unit was 99 per cent. Continued use of this facility has demonstrated that the ion exchange unit can routinely achieve a 98.5 percent yield with the 2-column system, based on 90 percent of the feed being oxalate supernates and no greater than 10 percent (on a plutonium basis) being miscellaneous solutions, i.e., rag leaches, spent resin leaches, analytical laboratory wastes, PuO_2 dissolver clean-out runs, and other similar solutions.

b. Teflon-Lined Dissolver Tests

Studies were continued in the hood 42 teflon-lined batch dissolvers used for dissolving plutonium oxide powders. The purpose of the studies is to develop a dissolver system capable of withstanding the corrosive environments (e.g., HF-HNO_3 , HCl-HNO_3) required for dissolving miscellaneous materials in the reclamation facility dissolvers. Studies during the month indicated that a specially designed immersion heater would provide adequate heating and agitation in the teflon dissolvers. The initial unit was fabricated from 304-L stainless steel. Since the basic feasibility of the heater has been demonstrated, new heaters of more corrosion-resistant materials are being procured.

c. Recuplex Deactivation

Removal of plutonium-bearing solids from the J-26-A evaporator continued throughout the month. The solids have been successfully dissolved by HCl and HF-HNO_3 dissolution. To date, approximately 8 kgs of plutonium have been removed from the evaporator. The solids in J-26-A have been analyzed and range from 25 - 100 percent plutonium sulfate. The density of the caked solids in J-26-A is extremely high, in excess of 3.0. Based upon new neutron counter standards for the high density plutonium sulfate, it is estimated that between 2 to 4 kgs of plutonium remain in the J-26-A evaporator.

A report entitled "Program for Emptying Recuplex Tanks and Flushing the Facility" has been prepared and accepted as a basis for future deactivation activities. The document presents methods for safely emptying the solutions from the various Recuplex vessels and recovering most of the plutonium from them. Also, it provides a method for flushing and clean-out of the process vessels and inner hood environment to acceptably low plutonium levels for subsequent removal operations.

d. Spent Resin Leaching

The anomalies that existed between analytical results and the neutron counter checks concerning plutonium left in the ion exchange resins have been clarified. Correcting for americium

[REDACTED]

analytically and establishing a standard for the neutron counter gave results that checked within ± 25 percent. Elutions of spent resin, using a hot water spray-wash system have reduced the plutonium left in the resin from original values as high as 25 g/l to acceptable discard concentrations (less than 1.0 g Pu/l).

e. Chloride Removal Process

The chloride from dissolved J-26-A (Recuplex evaporator) solids has been successfully removed by the tri-oxalate precipitation process using laboratory equipment. Waste losses previously reported as less than 0.5 percent were found to be less than 0.2 percent after a double precipitation process and correcting for americium present.

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4. Separations Chemistry Laboratory

a. Purex Process Improvement

In an effort to reduce the amount of activity being routed to the crib in the AAD stream (F-5 condensates), a laboratory test was made using the AAD as 1CX. The AAD increased the amount of radioruthenium in the 1CU by a factor of 13 precluding its use as 1CX.

b. Redox Process Improvement

Methods for Preparing Diban

Possible methods for the preparation of diban (dibasic aluminum nitrate) on plant have been investigated.

Dibasic aluminum nitrate, $Al(OH)_2NO_3$, is a compound in which the nitrate ions do not satisfy the sum of all the charges of the aluminum ions. Solutions of diban may be termed "acid deficient," with two moles of acid deficiency for each mole of aluminum constituting stoichiometric diban. Commercial solutions of diban received at Hanford have not exceeded 1.8 moles of acid deficiency per mole of aluminum.

Of the methods investigated, two appear to be most feasible: (1) acid boil-off from aluminum nitrate solutions, (2) mercury catalyzed dissolution of aluminum metal in aluminum nitrate solution.

The acid boil-off method consists of boiling 100% aluminum nitrate nona-hydrate with continuous addition of water equal to the volume of distillate. Rates of acid boil-off are such that one mole of acid deficiency per mole of aluminum is readily achieved with up to 1.8 moles being a question of economics. This method yields the highest purity solution of the methods tested.

Mercury catalyzed dissolution of aluminum metal is easily accomplished with the solution purity dependent on the purity of the metal. A proposal to utilize scrap aluminum (x-8011 nickel alloy) from the canning operation proved unsuccessful due to the gross amount of oxides formed and the slow rate of dissolution.

c. Fission Product Process Improvement

The oxidation of cerium with permanganate and the subsequent extraction of Ce(IV) into D2EHPA was tested in the laboratory using a synthetic HAF spiked 1 to 100 with Semiworks HAF. Potassium permanganate was added in five 0.01 mole increments over a 50 minute extraction period. Ninety to 95 per cent of the cerium was extracted into laboratory solvent while only 70 per cent was extracted into Semiworks solvent.

The poor extraction experienced with permanganate oxidized cerium in the Semiworks prompted a renewed search for an alternate oxidizing

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agent. Sodium bismuthate at a concentration greater than 0.04M and a mixture of 0.02M PbO₂ and 0.02M KMnO₄ both showed excellent oxidation and extraction characteristics for cerium on a lab scale.

d. Laboratory Improvement

A spectrophotometric method for calcium has been developed based on the color developed by a Fluorexone* complex. Calcium in the 10-100 microgram range can be determined with a standard deviation of $\pm 18\%$ by measuring absorption at the 219 mu peak. A procedure to permit the separation of strontium from calcium is being evaluated for use with this method.

Laboratory evaluation of three strong base ion-exchange resins (IRA-401, Permutit SK, Dowex-1 x 4) was successful in recovering only 30 to 40% of the technetium present in a decalco waste solution. Technetium breakthrough was experienced early in the extraction and continued at a high rate throughout the extraction of 10 column volumes of feed. Work on this problem is continuing.

* Trade Name

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5. Plutonium Chemistry Laboratory

a. Electrowinning of Plutonium Metal

Substitution of NaCl-KCl for LiCl-KCl gave less melt volatilization, but resulted in lower efficiency. Plutonium oxide was used as a cell feed in a run at 65 grams of plutonium per hour in a seven hour run, with a cathode current efficiency of 62 percent.

Use of NaCl-KCl melt resulted in a loss of only about 20 grams of melt by volatilization, but gave a cathode current efficiency of 66 percent. Comparable runs, made at instantaneous rates of 400 grams per hour may volatilize as much as 200 grams of melt in a normal run (4 hours), but give efficiencies of about 80 percent. This volatilization creates an additional recovery problem and complicates off-gas handling. Another possibility for limiting melt volatilization may be to decrease the operating temperature (currently 950 C).

The oxide run was seven hours in duration. Pure oxide was fed to the chloride melt, which was continuously sparged with chlorine. The oxide feed rate was 65 grams of plutonium per hour, in contrast to the sustained chloride feed rate for this cell of 300 grams of plutonium per hour. The cathode current efficiency was 62 percent, assuming that a trivalent form of plutonium was being won. The only operating problem was due to melt volatilization which was worse than for normal runs. Although it is felt that higher rates of oxide processing could be attained in this cell, more development would be required to obtain satisfactory production rates.

b. Chloride Waste Recovery

A summary of available processes to convert chloride-bearing wastes to forms acceptable for nitrate processing has been prepared. A boil-off process is being recommended. No further laboratory work is planned on this problem at the present time.

H. S. Frank

Manager
Research and Engineering

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II. ACHIEVEMENTS (Continued)

H. FINANCIAL OPERATION

1. Production Cost Accounting

The following adjustments were made to give effect to the 4th Allocation of Funds, FY 1963 and to insure maximum use of funds: (1) \$350,000 of O2 Production amounts were relinquished primarily to fund IPD inventory overruns and (2) \$50,000 of O2 R&D funds were transferred to IPD to cover year end billing rate adjustments and other needs.

The FY 1964 operating budget was adjusted to reflect the charging of CPD Finance project work to CPD overhead rather than to Indirect Construction Expense. The latter account was discontinued as of July 1 in connection with the direct contracting of Architect - Engineer services with Vitro Corporation.

Routine work orders and expense codes were reviewed and changes made, including a complete revision of Purex "E" codes to enable better reporting and to satisfy data processing requirements in manipulating data.

A coding system was developed for the segregation of costs between the two weapons models.

Physical inventories of chemicals in all plants were observed at the end of June.

Special requests processed during the month included (1) 50 Kg's unclassified Pu as rods to Savannah River, (2) quotation on 400 Kg's Pu nitrate for NUMEC, (3) 2.24 Kg's unclassified Pu metal to Germany and (4) 100 grams of unclassified Pu metal to Switzerland.

CPD's investment in inventories at May 31, 1963 compared with budgeted amounts is as follows:

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(in thousands)	<u>Balance 5-31-63</u>	<u>Control Allocation</u>	<u>Surplus (Deficit)</u>
<u>Inventories</u>			
Essential Materials	\$ 814	\$ 825	\$ 11
Spare Parts & Standby	1 724	1 600	(124)
Special Materials	<u>78</u>	<u>103</u>	<u>25</u>
Gross Inventories	<u>2 616</u>	<u>2 528</u>	<u>(88)</u>
<u>Reserves</u>			
Essential Materials	61	58	3
Spare Parts & Standby	<u>550</u>	<u>481</u>	<u>69</u>
Total Reserves	<u>611</u>	<u>539</u>	<u>72</u>
Net Investment	<u>\$2 005</u>	<u>\$1 989</u>	<u>\$ (16)</u>

The control allocation does not reflect the FY 1963 Fourth Allocation of Funds. This revision increases total combined net inventory balances of Essential Materials, Spare Parts and Fabrication Work in Progress by \$85,000 resulting in a surplus of funds at May 31, 1963 of \$44,000.

2. Personnel Accounting

Service dates were adjusted for three employees of which two were returnees from educational leaves of absence.

3. General Accounting*

As of May 31, 1963, seventeen active projects had incurred costs of \$4,485,569 against authorized funds of \$5,754,200. Outstanding commitments totaled \$363,030.

During May two work authorizations were received from the AEC as follows: Directive HW-548, Work Authority No. 1, establishing AEC management and decrease in funds to \$16,500 on Project CAC-981, Fission Product Packaging Facility - B Plant; Directive No. AEC-219, Work Authority No. 1 authorized \$205,000 to perform procurement and technical guidance of the Architect-Engineer on Project CAC-987, Metal Stabilization Facility - 234-5 Building.

Construction Completion and Cost Closing Statements were issued during June on the following projects:

<u>Project Number</u>	<u>Project Title</u>	<u>Total Cost</u>
CGC-897	Fission Product Concentrates Storage Facility - 200-E	\$1 399 636
CAC-928	Leak Detection-High Level Waste Tanks 241-A and 241-SX	71 636
CGC-930	Secondary Containment of Dissolver Off Gases - Purex & Redox	262 298
CGC-948	Strontium Storage and Waste Disposal - Hot Semiworks	161 816
CAC-950	Cesium Load-out Facility	44 613

* Funding approvals only. May differ from costs stated in other sections of this report which include nonfund equipment transfers.

Manager - Finance

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III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

<u>Operation</u>	<u>Monthly Salaried</u>		<u>Weekly Salaried</u>		<u>Total</u>	
	<u>5-26-63</u>	<u>6-30-63</u>	<u>5-26-63</u>	<u>6-30-63</u>	<u>5-26-63</u>	<u>6-30-63</u>
General Manager's Group	11	11	2	2	13	13
Financial	13	14	15	15	28	29
Research & Engineering	63	63	28	30	91	93
Facilities Engineering	63	64	24	26	87	90
Power & Crafts Operation	38	38	234	237	272	275
Production	6	6	4	4	10	10
Redox	58	58	232	232	290	290
Purex	66	70	262	266	328	336
Weapons Manufacturing	<u>49</u>	<u>50</u>	<u>218</u>	<u>222</u>	<u>267</u>	<u>272</u>
Total	<u>367</u>	<u>374</u>	<u>1 019</u>	<u>1 034</u>	<u>1 386</u>	<u>1 408</u>

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Other G.E. Components</u>		
W. S. Frank	New York, New York	Attend Managers' Engineering, Laboratories meeting. (6/11/63)
G. C. Oberg	Manufacturing Services Schenectady, New York	Attend Laser Symposium and conduct discussions on O-3 Hanford sponsored programs with Mfg. Services personnel. (6/18 - 20/63)
P. R. McMurray R. E. Smith	Cincinnati, Ohio	Engineering consultation. (6/26 - 27/63)
<u>To AEC and Other AEC Contractors</u>		
G. C. Oberg	Union Carbide Nuclear Co. Oak Ridge, Tennessee	Discuss hydroformed parts. (6/21/63)
H. L. Brandt R. A. Ciccarelli	Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss fluidized bed reactors and technology. (6/24 - 25/63)
	Brookhaven National Lab. Upton, New York	Ditto above. (6/26/63)
	Argonne National Lab. Lemont, Illinois	Ditto above. (6/27 - 28/63)
P. R. McMurray R. E. Smith	Oak Ridge National Lab. Oak Ridge, Tennessee	Attend Symposium on Isotopic Power Fuels. (6/24 - 25/63)
<u>To General Industry</u>		
D. R. Giblett	Northwest Copper Co. Portland, Oregon	Equipment for the Pu Reclamation Facility. (6/9/63)
P. S. Kingsley	Heyster Company Portland, Oregon	Procure sample welds. (6/26 - 27/63)
	Automatic Welders Portland, Oregon	Procure sample welds. (6/26 - 27/63)
R. A. Kennedy	Coates Electric Seattle, Washington	Proposed design changes. (6/30 - 7/1/63)

C. TRIPS (Continued)

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Conventions and General Meetings</u>		
M. H. Campbell R. J. Sorenson	Bellingham, Washington	Present paper and attend American Chemical Society meeting. (6/16 - 18/63)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From Other G.E. Components</u>		
G. Street	Vallecitos Atomic Lab. Pleasanton, Calif.	Recovery and potential use of by-products. (6/11/63)
R. J. Skilton	APED San Jose, Calif.	Log scintillation gamma monitor. (6/18/63)
<u>From AEC and Other AEC Contractors</u>		
E. A. Stisser D. A. Williams	Lawrence Radiation Lab. Livermore, Calif.	Reviewing gage capability and process. (6/6/63)
W. H. Johnson M. Caulkins) L. Killian) W. Miller)	LRL, Livermore, Calif. Albuquerque Oper. Office Albuquerque, New Mexico	Fabrication consultation and conduct Nuclear Matl. Quality Assurance Survey. (6/10 - 12/63)
R. M. Bristor	U.S. AEC Washington, D. C.	Plant Tour. (6/11/63)
Lawrence Walker	Albuquerque Oper. Office Albuquerque, New Mexico	To tour facilities. (6/13/63)
P. C. Nosler K. L. Swinth	U.S. AEC Germantown	T-Plant crane demonstration. (6/19/63)
A. B. Mercer E. B. Tremmel	U.S. AEC Germantown	Inspection of U-canyon and crane and Redox facilities. (6/28/63)

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D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors (Continued)</u>		
J. F. Frost E. E. Strom	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Discuss purity metal foundry operation. (6/24 - 26/63)
Clark Williams	Brookhaven National Lab. Upton, New York	Purex and waste management processes. (6/28/63)
<u>From General Industry</u>		
Robert Brauer	Calif. Metal Enameling Co. Seattle, Washington	Discuss metal sign procurement. (6/10/63)
P. Berner	Star Machine Co. Seattle, Washington	Supervise installation of new machine tools. (6/11 - 13/63)
W. Lindsly	Lodge & Shipley Machine Co. Los Angeles, Calif.	Ditto above. (6/11 - 13/63)
R. G. Kenney	Carborundum Company Seattle, Washington	Consultations on abrasives and Vacu-blast equipment. (6/20/63)
J. J. Morris	Precision Engineering Co. Seattle, Washington	Ditto above. (6/20/63)
J. E. Lynch F. W. Webking	Nalco Chemical Company Portland, Oregon	Discuss water treatment. (6/27/63)
T. F. D'Muhala	General Dynamics Corp. Groton, Connecticut	Decontamination chemicals and waste handling. (6/27/63)
W. E. Beall	Boeing Company Seattle, Washington	Inspection of U-canyon and crane and Redox facilities. (6/28/63)
M. H. Gallaher	13th Naval District Seattle, Washington	Discuss mutual welding problems. (6/28/63)
R. C. Schall	W. P. Keith Company Pico Rivera, California	Repair furnace purchased from W. P. Keith Company.

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IV. SAFETY AND SECURITY

<u>Operation</u>	<u>General</u>	<u>FEO</u>	<u>Finance</u>	<u>WMO</u>	<u>P&CO</u>	<u>Purex</u>	<u>Redox</u>	<u>Prod.</u>	<u>R&E</u>	<u>CPD</u>	<u>YTD</u>
Dis. Injuries				1*	1**					2	5
Ser. Accidents					1***		1****			2	2
Med. Treat. Inj.		2		6	21	10	8	1		48	265
Rad. Occur.				2		6	3			11	73
Contam. Wd.							2			2	11
Pu Dep.				1						1	5
Fires				1*****						1	4
Sec. Viol.									3	3	9

*DISABLING INJURY 63-4, 6/3/63. The injured was sitting on the edge of a work bench observing a fellow employee. As he was rising to stand on the bench, he apparently lost his balance and fell to the concrete floor, landing squarely on his buttocks incurring a chip fracture of the first lumbar vertebra.

**DISABLING INJURY 63-5, 6/17/63. The injured was hooking a trailer to a power wagon when his left index finger was pinched between the two parts of the hitch. Surgical repair was done following the injury. Complications necessitated additional surgery on 7/9/63.

***Serious Accident. 5/31/63. (Not classified until June). Employee fell off loading dock when movable scaffolding rolled unexpectedly catching him on narrow ledge.

****Serious Accident. 6/10/63. A small amount of dilute UNH solution was sprayed into an employee's face while investigating the malfunction of an instrument control relay.

*****Fire. 6/20/63. Damage: \$212.00-----A faulty lubricating system caused inboard fan shaft bearing to freeze. Friction between the drive belts and the sheave probably generated sufficient heat to ignite the belts.

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V. REPORTS

A. PREPARED AND ISSUED

- HW-76782, Official Use Only, "Project Proposal, New Standards Laboratory - 'Z' Plant (Project CAC-102)", dated April 26, 1963, by M. N. Raile.
- HW-77063, Official Use Only, "Project Proposal, Recoverable Plutonium Partitioning Facilities - 236-Z Building (Project CAC-104)", dated June 6, 1963, by L. W. Finch.
- HW-77369, Unclassified, "Plutonium Recovery by the Quick-Leach Process", dated April 26, 1963, by M. H. Curtis.
- HW-77591, Confidential, "Screening Tests for Proposed Molten Salt Electrolytes", dated May 10, 1963, by C. R. Becker and T. S. Soine.
- HW-77711, Official Use Only, "Project Proposal, Revision #4 - Plutonium Reclamation Facility - 'Z' Plant (Project CAC-880)", dated June 7, 1963, by L. W. Finch.
- HW-77739, Unclassified, "Development Report, Prototype Six-Decade Logarithmic, Scintillation Gamma Monitor", dated May 27, 1963, by F. S. Stong.
- HW-77753, Unclassified, "Design and Performance Criteria for a Six-Decade Scintillation Gamma Monitor", dated May 28, 1963, by F. S. Stong.
- HW-77755, Secret AWD, "Progress Report - Weapons Process Engineering - May, 1963", dated June 5, 1963, compiled by members of the Weapons Process Engineering Operation.
- HW-77790 RD, Secret, "Purex Plant Production Schedule - June 1963", dated June 5, 1963, by D. McDonald.
- HW-77791 RD, Secret, "Redox Plant Production Schedule - June 1963", dated June 5, 1963, by D. McDonald.
- HW-77792 RD, Secret, "UO₃ Plant Production Schedule - June 1963", dated June 5, 1963, by D. McDonald.
- HW-77793 RD, Secret, "234-5 Plant Production Schedule - June 1963", dated June 5, 1963, by D. McDonald.

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- HW-77807, Confidential, "Critical Mass Control Specification - General Specification - Pu²⁴⁰ Concentration", dated June 10, 1963, by R. J. Sloat.
- HW-77823, Secret, "Exceeding Always Safe Ratio in F-2 and F-1 Tanks, Redox Processing, Redox Operation", dated June 6, 1963, by H. P. Simonds.
- HW-77828, Unclassified, "Chemical Analyses of In-Tank Water Leach of TK-241-A-103 Sludge as a Function of Time", dated June 6, 1963, by T. R. McKenzie.
- HW-77841, Secret, "Plutonium Fabrication and Assembly Study", dated June 17, 1963, by W. J. Gartin.
- HW-77844 RD, Confidential, "Trip Report: May 14 - May 24, 1963", dated June 10, 1963, by H. H. Hopkins, Jr. and T. S. Soine.
- HW-77877 RD, Secret, "Np Schedule - FY 1964", dated June 12, 1963, by V. R. Chapman.
- HW-77941, Secret, "Analysis of Brandy Batch Purex Nos. 1 and 2", dated June 18, 1963, by J. H. Warren.
- HW-77947, Secret AWD, "Inspection Method for Tsetse Components", dated June 21, 1963, by L. L. McGregor.
- HW-77962, Unclassified, "Drop Test of Unbuffered 1/4 Size Model HAPO-IB Cask", dated June 25, 1963, by C. W. Smith. (Rough Draft)
- HW-77963, Unclassified, "Model Studies of Buffered Shipping Containers for Fission Products", dated May, 1963, by E. A. Ripperger.
- HW-77981, Confidential, "Scheduled Shutdown - Uranium Oxide and Purex Plants", dated June 20, 1963, by J. H. Warren.
- HW-77984, Secret, "Waste Tank Fill Program", dated June 20, 1963, by R. E. Isaacson.
- HW-77987, Confidential AWD, "1807 Crack-Type Defects", dated June 6, 1963, by R. J. Dal Ponte.
- HW-77993, Secret AWD, "MC-1807 Engineering and Gage Review", dated June 21, 1963, by A. E. Smith.
- HW-78003, Secret, "Analysis of Plutonium Samples (No. XXIX) on Interplant Exchange Program", dated June 21, 1963, by O. F. Beaulieu.
- HW-78006, Confidential, "Limit Gaging and Special Inspection Fixture Approval", dated June 24, 1963, by A. E. Smith.
- HW-78064 RD, Secret, "IPD Discharges - June through August, 1963", dated June 27, 1963, by J. H. Warren.
- HWS-8250, Unclassified, "Specification for Procurement of a 100,000 psi Isostatic Pressing System - 234-5 Building - 200-W Area", dated June 17, 1963, by D. D. Wodrich.

B. PREPARED FOR SIGNATURE AND ISSUANCE

HW-77794, Secret, "Production - May 1963", dated June 3, 1963, by
W. E. Johnson.

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JUNE, 1963

VI. PATENT SUMMARY

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

<u>INVENTOR</u>	<u>TITLE</u>
M. D. Alford, Purex Operation	Fission Product Shipping Cask Loading Equipment

P. H. Reimku

General Manager
Chemical Processing Department

DECLASSIFIED

END

**DATE
FILMED**

3 / 18 / 93