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MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

JUNE 1955

HANFORD 59803

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Compiled by
DEPARTMENT MANAGERS

July 28, 1955

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RICHLAND, WASHINGTON

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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

JUNE 1955

GENERAL SUMMARY

PRODUCTION OPERATION

On June 10, while the water flow was being lowered normally at F Reactor in preparation for the discharge of a ruptured slug, the 3X system balls were released from all hoppers but one which was locked out. The causes of the incident were determined to be a breakdown of cable insulation which caused a short circuit and erratic relay operation. Approximately 146 hours of outage time were required for ball removal.

The TBP Plant operated at rates up to nine tons per day during the first half of the month following the correction of the waste loss problem in late May. On June 16 high gamma product began to appear, and problems arising from this source continued till month end despite steps taken to improve decontamination efficiency. The plant was shut down on June 20 for thorough column flushing, and at month end the system was in the final stages of being cleared of all young waste material in preparation for getting the plant back to efficient operation on older metal waste.

ENGINEERING TECHNOLOGY

Progress to date on procurement of ribbed zirconium process tubes for high pressure, high temperature recirculation tests in the KER Facility, is not encouraging. To date no billets have been unsuccessfully extruded.

Two leaking process tubes removed from the central zone of D Pile had heavily corroded areas which contained minimum tube wall thicknesses of 10 to 14 mils versus 40 to 50 mils for normal areas. Examination of a normal uranium slug failure from 105-H showed severe intergranular corrosion of the aluminum jacket in the area of rupture. Apparently, this region of the slug had not been adequately cooled during pile exposure.

Tentative agreement has been reached with the Commission and criteria and procedures established for a modification to the current inspection policy on engineered equipment to provide for inspection by one of the following: (1) General Electric off-site, (2) Government agencies off-site, or (3) General Electric at HAPO.

The higher reactor productivity in 1954 compared to that experienced in 1953 is equivalent to that obtainable from spending $120,000,000 for new reactor construction.

PERSONNEL AND SERVICES

During the month of May expenditures for Construction Work in Progress totaled $2.5 million, the largest expenditure in any one month since March, 1954. The large increase in May above the previous 12-month average of $1.7 million is primarily due to the increased activity on CG-558 - "Reactor Plant Modifications for Increased Production", which accounted for 44% of the total construction expenditures in May.

A major injury to an operations employee on June 21 ended 143 days of no lost time injuries. 6,755,342 man hours of exposure were accumulated and resulted in the winning of the Central Safety Council's award.

Effective midnight June 30 both policing and fire protection for North Richland was discontinued by HAPO with the latter functions being turned over to the Army.

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STAFF

General Manager, Atomic Products Division	F. K. McCune
General Manager, Hanford Atomic Products Operation	W. E. Johnson
Counsel	G. C. Butler
Manager, Finance	D. M. Johnson
Manager, Employee and Public Relations	L. L. German
Director, Radiological Sciences	H. M. Parker
Manager, Engineering	A. B. Greninger
Manager, Manufacturing	J. E. Maider
Operations Research Study	B. F. Butler

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HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
JUNE 30, 1955

DEPARTMENT	EXEMPT 6-30-55	EXEMPT 5-31-55	OTHER 6-30-55	OTHER 5-31-55	TOTAL 6-30-55	TOTAL 5-31-55
Counsel	3	3	1	2	4	5
Operations Research Study	6	6	1	1	7	7
Employee & Public Relations						
General	9	8	8	8	17	16
Salary & Wage Administration	11	11	11	11	22	22
Personnel Practices	15	15	41	41	56	56
Education & Training	6	6	66	31	72	37
Emp. Comm. & Pub. Rel.	10	11	40	41	50	52
Union Relations	5	5	1	1	6	6
Aux. Oper. & Plant Prot.	115	115	815	804	930	919
Community	82	82	346	339	428	421
Health & Safety	52	52	176	182	228	234
Engineering Department						
Engineering Administration	38	38	83	85	121	123
Advance Engineering	9	10	1	1	10	11
Design	182	181	120	120	302	301
Project	176	180	166	168	342	348
Pile Technology	235	230	152	143	387	373
Separations Technology	171	166	92	94	263	260
Manufacturing Department						
General	22	21	9	8	31	29
Reactor	316	314	1 379	1 361	1 695	1 675
Separations	302	302	1 617	1 616	1 919	1 918
Metal Preparation	109	106	562	549	671	655
Transportation	44	44	448	446	492	490
Purchasing & Stores	60	60	221	215	281	275
Electrical Utility	16	16	75	75	91	91
Financial Department						
General	9	9	6	1	15	10
Budgets & Measurements	6	4	4	4	10	8
Contract Cost	24	25	94	93	118	118
General Accounting	9	9	58	60	67	69
Property Accounting	16	15	47	48	63	63
Auditing	13	12	2	2	15	14
SS Accountability	10	10	35	35	45	45
Personnel Accounting	9	9	55	55	64	64
Procedures & Computing	30	29	55	50	85	79
Radiological Sciences Department						
General	5	5	-	-	5	5
Records & Standards	29	29	166	167	195	196
Biophysics	53	53	71	68	124	121
Biology	31	31	42	39	73	70
Engineering	6	6	1	1	7	7
Adm. & Comm.	3	3	5	5	8	8
GRAND TOTAL	2 247	2 231	7 072	6 970	9 319	9 201

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AREA PERSONNEL DISTRIBUTION
JUNE, 1955

	100-B Area	100-D Area	100-F Area	100-H Area	100-K Area	101 Area	200-E Area	200-W Area	300 Area	700-1100-3000 Area and Plant General	Total
Engineering Department											
Exempt	24	64	-	12	19	-	40	63	281	308	811
Other	11	26	2	80	17	-	18	32	214	214	614
Total	35	90	2	92	36	-	58	95	495	522	1 425
Manufacturing Department											
Exempt	63	57	75	68	53	-	94	223	111	125	869
Other	268	305	314	256	245	-	425	1 237	558	703	4 311
Total	331	362	389	324	298	-	519	1 460	669	828	5 180
Financial Department											
Exempt	-	-	-	2	-	-	-	6	7	111	126
Other	-	-	-	6	-	-	-	19	12	319	356
Total	-	-	-	8	-	-	-	25	19	430	482
Employee & Public Relations Department											
Exempt	22	6	6	6	9	-	7	12	10	227	305
Other	71	44	83	43	51	11	43	114	102	942	1 504
Total	93	50	89	49	60	11	50	126	112	1 169	1 809
Radiological Sciences Department											
Exempt	1	-	33	-	-	-	4	18	64	7	127
Other	3	-	47	-	3	-	20	15	177	20	285
Total	4	-	80	-	3	-	24	33	241	27	412
General											
Exempt	-	-	-	-	-	-	-	-	-	9	9
Other	-	-	-	-	-	-	-	-	-	2	2
Total	-	-	-	-	-	-	-	-	-	11	11
Total Exempt	110	127	114	88	81	-	145	322	473	787	2 247
Total Other	353	375	446	385	316	11	506	1 417	1 063	2 200	7 072
Grand Total	463	502	560	473	397	11	651	1 739	1 536	2 987	9 319

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MANUFACTURING DEPARTMENT
JUNE 1955

METAL PREPARATION SECTION

A net production of 376 tons of acceptable finished slugs, including 18 tons of cored slugs, was achieved in June. This production was 104 percent of the official forecast.

The canning yields for solid and cored slugs were 73 and 71 percent respectively. The composite yield was 73 percent, which is a drop of nine percent from the yield experience of May. The causes for most of the rejects were poor bonds, bad welds, inclusions and marred surfaces. The poor bond reject experience actually improved one percent during the month. However, the inclusion rejects increased from one to twenty percent. Both the sleeve honing and the autoclave operation are being investigated for conditions which could cause this final inspection defect.

The canned slug inventory was reduced to less than three weeks supply at month end due to heavy discharges from the KW Reactor. Bare slug inventory remained at approximately a two and one half week supply.

There were no autoclave failures during the month.

A total of 660 tru-line uranium-enriched aluminum alloy slugs were hot press canned with a yield of 86 percent. Other canning production during the month included 898 lead poison slugs and 1176 thorium slugs, both canned by the cold unbonded method.

REACTOR SECTION

The total and plutonium input productions were 114.9 and 114.7 percent of the official forecast respectively. The forecast was exceeded due to higher than anticipated levels and to postponing a horizontal rod replacement outage. The time operated efficiency was 77.3 percent which is approximately 2 percent lower than the May efficiency. The major factors contributing to the low efficiency were the continued high frequency of slug failures, the dropping of the 3X system balls at F Reactor, the process leak tube testing program, and the continued large amount of charge-discharge time required by the low concentration program.

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The plutonium output production was 142.9 percent of forecast due to increased discharges to compensate for longer basin cooling time and a KW discharge which had originally been scheduled for July. Tonnages of low and high concentration metal discharged were 372 and 55 respectively.

The established maximum reactor power levels, excluding burnout, were increased a total of 80 megawatts, 45 at DR Reactor, 15 at KE Reactor, and 20 at KW Reactor. At DR Reactor, flattening improvement resulted in the increase, while at KE and KW Reactors long term gains contributed to the increase.

A total of 28 slug failures occurred during June. The individual reactor experience was as follows: At C Reactor there were a total of 11 ruptures including four regular uranium, four zirconium canned slugs on production test, one C type enrichment slug and two J type enrichment slugs in a single tube; D Reactor experienced nine regular uranium slug ruptures; F Reactor experienced two regular uranium slug ruptures; at H Reactor there was one regular uranium rupture and five J type enrichment slug ruptures in a single production test tube. The total outage time required for slug removal was 398.4 hours.

Sixteen reactor scrams occurred, of which 12 were caused by normal Panellit system variables. One scram at KE Reactor resulted from a low level pile trip which occurred during an instrument voltage adjustment. KE Reactor was scrammed twice due to high pressure trips resulting from pressure manipulation at the 1706-KE recirculation facility. C Reactor was scrammed once due to a process water pump turbine trip. The total outage time attributed to scrams was 52.4 hours.

On June 10, while the water flow was being lowered normally at F Reactor in preparation for the discharge of a ruptured slug, the 3X system balls were released from all hoppers but one which was locked out. The causes of the incident were determined to be a breakdown of cable insulation which caused a short circuit and erratic relay operation. Approximately 146 hours of outage time were required for ball removal.

B, D, and H Reactors were each partially leak tested as the result of abnormal water collection rates. No leaking tubes were found at B Reactor, two leaking tubes were found at H Reactor, and two tube leaks and three Van Stone leaks were found at D Reactor. At month end, water collection rates at these reactors had returned to normal. Outage time involved in leak testing amounted to approximately 66 hours.

The U-233 input production was 142.2 percent of the forecast as the result of cancelling the scheduled June discharges of the material because of shipping schedule changes. Production charged to thorium irradiation at C and H Reactors was 3.8 and 3.2 percent of the total, respectively.

The shipment of irradiated J material continued at a reduced rate during the month with a total of 2800 pieces being shipped.

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SEPARATIONS SECTION

The monthly production of all facilities, with the exception of TBP and UO_3, exceeded the official forecast quotas. All facilities met or exceeded the quarterly forecast quotas.

The Redox Plant operated at a rate of 9 tons of uranium per day from the beginning of the month until June 11 when a plugged line on the final plutonium concentrator caused a 22½ hour shutdown. After start-up, rates were continued at 9 tons per day until the depletion of aged feed material on June 13 when the plant was shut down for 11½ days for decontamination and repair work to the 60-ton crane. The plant resumed operation on June 25 at a 6-ton rate. On June 27 the rate was raised to 8 tons per day and maintained through the month end. The monthly production exceeded the official forecast by one percent.

The T Plant production was curtailed during the first ten days of the month due to operational and equipment difficulties. In spite of these difficulties, new all-time records were established in the tons of metal dissolved and plutonium produced. The production was 115 percent of the official forecast quota for the month.

The TBP Plant operated at rates up to 9 tons per day during the first half of the month following the correction of the waste loss problem in late May. On June 16 high gamma product began to appear, and problems arising from this source continued till month end despite steps taken to improve decontamination efficiency. The break-through of fission products was attributed at first, but not conclusively, to the unexpected failure of the flowsheet to remove zirconium, niobium and ruthenium from feed streams made up of approximately 50 percent young metal wastes aged 17 months as compared to the older 2½ year aged metal previously processed. The plant was shut down on June 20 for thorough column flushing, following which the plant still failed to decontaminate. At month end the system was in the final stages of being cleared of all young waste material in preparation for getting the plant back to efficient operation on older metal waste. The production for the month was only 79 percent of the official forecast, although the quarterly forecast production was exceeded.

Operation in the UO_3 Plant was normal but limited in feed material by the TBP process problems and the 11½ day shutdown of Redox Plant. The production for the month was 90 percent of the official forecast, but the quarterly production forecast quota was exceeded substantially.

Processing activities in the Isolation Building were relatively normal. The operating activity in metal fabrication was concentrated upon meeting the unusually high production schedule. The Fabrication Plant exceeded the monthly forecast quotas, and established an all time record in the numbers of cores fabricated.

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The West Area Evaporator continued operation during the month on first cycle evaporator bottoms with a volume reduction of 25.7 percent.

Metal waste removal continued during the month, supplying the TBP Plant with feed consisting mainly of blends of material aged 17 months and 2½ years. At month end, due to difficulties encountered in the TBP Plant, only 2½ year old wastes from the TX tanks were being removed.

GENERAL

Personnel

On Roll June 1, 1955	5133
Net Increase	47
On Roll June 30, 1955	5180

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

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MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF JUNE, 1955

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

INVENTOR	TITLE
Lester J. Bonney W-16814-6417 Separations Section	1. Bonney Type Gasket Retainer This is a devise for remotely positioning and retaining a gasket on the Hanford type connector head or any flat surfaced pipe connector head of similar design. The ease and rapidity with which it can be installed or removed makes it ideal for all purpose use.
Lester J. Bonney W-16814-6417 Separations Section	2. Bonney Type "In-Line" Orifice Cleaner This is a device for cleaning or unplugging an orifice used in flow control of liquids or gases. It is adaptable to any size flow line and makes possible the unplugging of an orifice without removing the orifice from the flow line.

J. E. Maider

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

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July 8, 1955

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
June, 1955

I. RESPONSIBILITY

There was no change in responsibility during this period.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	June	May	Year to date
Total Acceptable Slugs Canned (Tons)	376	404	2367
Composite Canning Yield (%)	73	82	78
Efficiency (%) (Canning Throughput)	93	95	94
Forecast Achievement (Current commitment)	103	111	106
Net Acceptable Solid Slugs (Tons)	358	377	2251
Slugs Returned from Reactor (Tons)	8.03	6.05	30.57
Canning Yield (%)	73	82	79
Net Acceptable Cored Slugs (Tons)	18	27	116
Slugs Returned from Reactor (Tons)	.27	.35	.76
Canning Yield (%)	71	79	72
Autoclave Failure - Solid (No./M)	.00	.001	.001
Autoclave Failure - Cored (No./M)	.00	.00	.00
Acceptable C-4 Slugs Canned (Pieces)	864	728	5898
Acceptable Pb-Cd Slugs Canned (Pieces)	431	808	8863
Acceptable 10-66 Slugs Canned (Pieces)	300	351	697
Average Steam Generated (M lbs/hr)	23.2	33.6	
Maximum Steam Generated (M lbs/hr)	33.0	52.0	
Total Steam Generated (M lbs)	16,750	25,021	
Coal Consumed (Tons)	1,155	1,626	
Sanitary Water from 3000 Area (Million Gals.)	60.4	55.8	
Average Rate (GPM)	1,397	1,250	

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2. Activities

A net production of 376 tons of acceptable finished slugs, achieved in twenty two working days, was essentially 104 percent of forecast. Eighteen tons of this total were cored slugs. Six canning line shifts per day were operated throughout the month and line relief was provided when manpower was available.

Actual production for FY 1955 completed in June was 4540 tons. The production commitment for the fiscal year of 4374 tons was exceeded by approximately four percent.

A composite yield of seventy three percent was experienced in June (seventy-three percent for solid slugs and seventy-one percent for cored slugs). This is a drop of nine percent from the yield experienced in May. The major causes for rejects were: poor bond, bad welds, inclusions, marred surfaces and frost test.

The inclusion rejects which increased from approximately one percent to nearly twenty percent during the month were formerly included in the miscellaneous category. These appear at final inspection as a visible defect in the aluminum surface of the canned slug. Both the sleeve honing and the autoclave operations are being investigated for conditions which could cause this defect. The poor bond or "dimple" reject experience previously reported, improved from two percent to one percent during the month. It appears that the occurrence of this reject may be influenced in part, at least, by removal of impurities built up at the lead alsi metal inter-face in the canning operation.

Approval to convert canning line operation from a fifty second to a forty five second cycle was received late in the month. Arrangements to convert the necessary equipment were immediately started and are nearly complete at month end.

The combined 300 and 100 canned slug inventory has reduced slightly to less than a three week supply at month end due primarily to heavy discharges at 100-KW Area. Bare slug inventory remained at approximately a two and one half week supply.

No autoclave failures occurred during the month.

Inventory of caps, cans and wafers originally purchased for the Mint Program, was reduced approximately $9000. during the month by charging this amount to the inventory reserve account. The material will be used in the canning operation as scrap aluminum.

Two-hundred, twenty gallons of zyglo oil and 100 pounds of developer were returned to the Magnaflux Corporation for a credit of approximately $600.

Four former construction buses have been placed in the 300 Area for plant defense purposes. A driver training program has been started to familiarize auxiliary drivers with the operation of the buses.

A committee comprised of representatives from all departments in the area is being formed to work out matters of education, policies, problems or suggestions pertaining to plant defense program.

The physical constants test reactor in 305-B is essentially complete. Test runs of the equipment are in process and corrections are being made as difficulties appear. It appears now that loading and actual operation will occur about July 15.

2. Activities - continued

An eleven ton rolling mill was installed in the basement of the 326 Building. It was necessary to construct a special skid to lower the mill into the building, and to enlarge two doorways within the building to permit moving it to its final location in room 12A.

A high pressure loop was installed in room 33 of the 3706 Building to test the reaction of uranium and water at elevated temperatures and connections are now being made for all required services. Preparations are in progress for pressure testing the loop and pump assembly, rated at 2000 p.s.i.

An investigation was completed on the canning history of the 16 recent low concentration pile failures, with no positive correlation being found.

A vendor evaluation order for 100,000 aluminum cans was placed with Hunter-Douglas Corporation. Harvey Machine Company is experiencing serious trouble with a similar order due to eccentricity of can wall. We are in close liaison with these vendors to aid wherever possible.

The concentration of the final etch acid has been lowered to a range of fifteen to thirty percent in an effort to reduce acid losses through vaporization.

The new slug pickle machine which sprays acid on the pieces, appears to be doing an inadequate job of removing the oxide film from bare uranium slugs. The material is re-oxidizing more quickly than it should. Flooding type nozzles are on order to replace the present spray type; also, other variables such as time are being studied. The acid loss from this equipment is very high.

Lead content in the canning baths continues to decrease. This appears to be primarily due to less carryover of lead on the surface of rod heat treated material than that experienced with Hanford salt bath treated slugs.

Operating procedures have been completed for all new equipment now in service. In conjunction with this activity, all procedures are being reviewed and re-written. Approximately twenty percent of the revised procedures are completed.

3. Special Operations

A total of 660 tru-line uranium enriched aluminum alloy "C" slugs were canned by the hot press process with a canning yield of 86 percent. Two hundred "C" slugs of this total were small diameter originally intended to be canned by the "C" process. No significant difficulties were encountered while canning any of this material.

1170 One-thousand, one-hundred, seventy 10-66 (thorium) slugs were canned by the "C" process with an initial through-put canning yield of approximately fifty-six percent. It was necessary to discontinue the canning of this material due to cracks and other defects in the thorium cores. The Process Sub-Section is investigating this problem at month end.

898 Eight-hundred, ninety-eight lead poison slugs were canned by the "C" process with yield of seventy-one percent. Although the yield was up approximately ten percent from that experienced last month, some difficulty is still being encountered in obtaining a satisfactory weld closure.

3. Special Operations - Continued

Aluminum plugs were crimped in approximately 600 cored slugs and the slugs were canned by the regular lead dip process.

In addition to regular production, approximately seventeen tons of solid reject uranium cores were canned during the month as part of the uranium commitment required for Purex start up. This should complete the Purex commitment since it is reported that 100-KW Area has twenty-eight tons of slightly irradiated material that can also be used for this start up.

4. Schedule Variance

Acceptable canned slug production was essentially 104 percent of forecast.

B. Equipment Experience

1. Operating Continuity

The canning line efficiency was ninety-three percent during June, a drop of two percent from May. Production outages of the new slug pickle machine, substantially contributed to the reduced efficiency.

Increasing voltage instability has been experienced with the two million volt positive ion accelerator in the 3745-B Building. This has reached a point where the equipment is not useable at present. Arrangements are being made for a vendor's engineer to assist us on this problem.

2. Inspection, Maintenance and Replacements

The Boltaron piping installed for nitric acid service between storage tanks and supply pumps has cracked in many places in the short time in service. This has been replaced by 304-L stainless steel.

Initial trial runs of one of the new sleeve cleaning machines were started early in the month. At month end, the machine was operating on a continuous productic basis.

Replacement nitric acid spray pressure gages were installed on both the number one and number two Metal Wash machines following an acid pressure gage failure during the month. Additional repairs and alterations were made to the number two machine during a ten day outage of this equipment.

The radiograph machine was out of service during the major portion of the month. Extensive trouble was experienced with the gear mechanism in the slug rotation trays and the shielding door cables. Alterations to this equipment are continuing at month end.

Operation of the penetration tester on a continual basis was started during the first week in June. Frequent mechanical and electrical failures however, prevented 100 percent inspection by this equipment.

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C. Improvement Experience

1. Production Tests

PT-313-47MT "Cored Slugs From Extruded Blanks and Rolled Rods" HW-33189

A total of 16 tons of finished eight-inch cored slugs was produced with a seventy-one percent yield. This represents an eight percent decrease in yield over last month and it is largely attributed to a general increase in all major reject categories. Production was limited as a result of excessive core oxidization being experienced upon conversion to the new spray-type pickling equipment. In order to alleviate this problem, the slug pickle time was extended, and the end plug welding amperage and the total elapsed time between slug pickle and canning reduced to a minimum.

In addition to the regular production, six-hundred recovered cored slugs were reprocessed with aluminum plugs as authorized by a supplement to the production test. A total of 2,914 cored slugs were received for an evaluation of crimped uranium end plugs. These slugs are being inspected and will be processed next period.

Because of a reduced demand for cored slugs in the reactors for high goal exposure, production schedules have been revised to a nominal rate of 40 tons per month through the remainder of the calendar year. The extrusion phase of the program will be continued on a developmental basis through August, after which extrusion schedules will either be revised or discontinued as warranted.

2. Process Tests and Revisions

The first of the oversized cores, 11,000 pieces, finished to a diameter 0.003 inches greater than normal, were tested in the 305 test pile. The gain in reactivity was equivalent to about three or four in-hours for a full pile loading in the old piles, which is quite small.

3. Inventions and Discoveries

Personnel in the Metal Preparation Section engaged in work which might be expected to result in inventions or discoveries have reported that no inventions or discoveries were made during the period covered by this report.

D. Events Influencing Costs

1. Labor Variance

Labor costs will increase about .005 per unit as a result of an eight percent decrease in canning yield and a slight decrease in operating efficiencies.

2. Material Variance

Material costs are expected to increase approximately .01 per unit as a result of an eight percent decrease in canning yields. Other contributing variables are: A high consumption of nitric acid due to exhaust losses on the Metal Wash machine, and due to the Boltaron pipe failure in the tank farm system, will unfavorably affect material costs. New sleeve consumption remained slightly higher due to the study of a possible relationship of inclusion rejects to the sleeve honing operation.

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3. Other Costs

An estimated increase in other costs of .01 per unit is based on a five percent decrease in production.

E. Plant Development and Expansion

1. Project Status

Project CA-514 - "Expansion of 300 Area Production Facilities" - Project authorized funds total $5,900,000. Project costs plus commitments by the General Electric Company total $4,527,543. and construction is estimated to be ninety-seven percent complete as of June 19, 1955. The project was officially closed on June 15, 1955 and work orders were issued to cover the remaining cleanup jobs.

Demolition work is complete except for a small portion of the old slug recovery area. The lighting in the old portion of the building is complete except for the installation of the flood lights at the inspection stations. Some difficulty has been encountered with the scrubbers and acid spray of the slug pickle machines. Acid flow tests are being made to determine present acid losses and the feasibility of converting the units to a cascade system.

The sleeve cleaning machines are complete and ready for operation. The cap and can cleaning equipment is complete except for a modification of the parts baskets. A prototype of the newly designed basket is being fabricated.

The slug recovery equipment has been installed and is being tested. Some difficulty is being encountered in the operation of the basket racks for this equipment.

The canning area conveyor system has been completed and tested; however, the need to modify the basket carrier and provide overhead protection from possible falling components has been seen. This problem has been submitted to the Project Engineering Group. The canning area ventilation system has been installed on three lines. The installation of this equipment is continuing as canning line equipment is made available.

The fourth automatic quench machine is being installed. The slug stamping machines have been received and tested and are ready to be installed.

Recut safety circuits have been installed and tested on all Acme Gridley cutoff machines. Experimental work is continuing relative to the collet liners and high noise level of these machines. Sound shielding has been installed on the number three machine.

The installation of the ventilating system for the weld booths is continuing. The exhaust system has been installed and tested on the west line. The increased air flow has eliminated the noxious odors and adequately reduced the temperature of the work location without affecting the quality of processed material. A study has been made relative to the high noise level of the weld quench drier. A design has also been completed for the acoustical treatment of this equipment.

The ductwork for the Penetration Etch machine in the east finishing line is nearing completion.

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1. Project Status - Continued

Some difficulty has been encountered in the operation of the number one Radiograp machine trays. Slight modifications are being made to correct this condition.

Project CG-610 - "Replacement of Existing 313 Building Roof"- Project authorized funds total $55,000. Work was started June 15. Removal of the old roofing material is approximately fifty percent complete. Completion date for the projec is estimated to be August 15, 1955.

Project CA-627 - "Replacement of 300 Area Fence" - Authorized funds total $26,000. The project received AEC approval on May 25. A notice of invitation fo bids was issued by AEC on May 31. The completion date has been established as January 1, 1956.

IR-194 - "Centralized Quality Reporting System" - Authorized funds $15,000. This request was approved by the AEC on June 6 and is to be done by plant maintenance forces. The completion date has been established as September 15, 1955.

Project CA-590 - "Fly Ash Collection Equipment - 384 Building" - Estimated cost - $38,000. This project was rejected by the AEC on May 19; however, this decision was reconsidered. A letter was received from the AEC Project Review Board requesting resubmittal of the project proposal. The proposal is being revised to stress the value of the improved safety, morale, and housekeeping.

Project CG-601 - "General Grounds Improvements - 300 Area" - Estimated cost - $96,000. This project proposal has not yet been approved by the AEC; however, unofficial telephone conversation with the AEC has indicated that it will be authorized in part. Significant reductions on grounds stabilization, parking area lighting and French drain installations are expected.

Project CG-614 - "Hanford 4X Program - 300 Area" - Estimated cost - $340,000. Scoping is complete and detail design is 97.2 percent complete. Authorized funds total $130,000. A revised directive will be issued to include installation as well as design and procurement previously authorized.

2. Plant Engineering

An engineering study is being made to determine the proper method of eliminating or reducing the extremely high noise level within the 303 manufacturing area. General scope drawings and specifications are in various stages of completion prior to the preparation of a project proposal to cover the major items of correction.

A new booth for visual inspection of process cans has been designed incorporating improved lighting. This will provide better inspection and less operator fatigue.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-36973	Operation Sub-Section Monthly Report, May,1955	WW Windsheimer	6-7-55
HW-37003	Process Sub-Section Monthly Report, May,1955	[illegible]	6-1-55

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1. Routine Reports - Continued

Number	Title	Author	Date
HW-37052	Monthly Report, New Fuel Element Production Program, May, 1955	WA Blanton	6-3-55
HW-37387	General Analytical Control Program I, Summary of Analytical Results Uranium Metal, January 1, 1955 to March 31, 1955	PR Anderson	6-21-55
HW-37416	General Analytical Control Program I, Uranium Metal, April 1, 1955 to April 30, 1955, Mallinckrodt Chemical Works	PR Anderson	6-22-55
HW-37417	General Analytical Control Program I, Uranium Metal, April 1, 1955 to April 30, 1955, National Lead Company of Ohio	PR Anderson	6-22-55
None	Project Status Report	FK Peck	6-20-55

2. Non-Routine

HW-37008	Uranium Quality Control Analytical Results	WG Hudson	5-31-55
HW-37623	Inclusion Rejects at Final Inspection	DE Christensen	6-27-55

VII. PERSONNEL

A. Organization

No change.

B. Force Summary

	Start of Month			End of Month			Net Change	
	Exempt	Non-Exempt		Exempt	Non-Exempt		E.	N.E.
Section General	1	1		1	1		0	0
Operation	25	169		25	164		0	-5
Power & Maintenance	34	67		37	69		+3	+2
Process	36	309		36	322		0	+13
Projects & Personnel Dev.	11	3		11	3		0	0
Section Total	107	549	(656)	110	559	(669)	+3	+10

C. Safety Experience

A major injury was suffered by an Instrument Maker in the 328 Shop on June 21 while operating a Cincinnati internal-external grinder. He caught his left ring finger in a pinch point between the positioning wheel and an indicating pointer support causing amputation of part of the first joint.

A near-serious accident occurred in the canning area during June while one of the new overhead component conveyor lines was being tested. A conveyor carrier loaded with a metal container and twenty-four steel sleeves tipped while traveling approximately fifteen feet above the canning area floor and dropped the sleeves and containe

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C. Safety Experience - Continued

to the area below. No personnel were injured and no equipment damage resulted. Corrective action to prevent a recurrence of this incident has been taken.

D. Radiation Experience

No exposures in excess of 200 mrads were reported during the month. Twenty-seven exposures in excess of 100 mrads per week were reported.

The new pickle machines were placed in operation during the month. Plywood shields, twelve inches high, were placed on both sides of the incoming conveyors to prevent personnel overexposure. A seventy-five percent reduction in exposure was effected by this simple shield without hampering production.

Uranium activities from 600 to 2000 counts per minute at one inch were detected on the pockets of fifteen of eighteen SWP jackets in clean storage. Further investigation with the cooperation of Radiation Monitoring, Separations Section, revealed that the jackets had passed the Laundry monitors because of the method of folding. Since the patch pockets are very difficult to decontaminate, it was decided to remove all patch pockets from the jackets.

E. Personnel Activities

1. Visits and Visitors

E. W. O'Rorke and T. D. Naylor visited Los Angeles, California to discuss specifications of component parts with probable vendors.

2. Meetings

Forty-three safety and security meetings and sixty-six round table and informati meetings were held for members of the Section.

Twenty exempt members attended Training Courses at W-10. A course on "Customer Relations" was presented to six exempt and 25 non-exempt members of the Section.

A Metal Preparation Cost Training program was held in the 3703 Conference Room and was attended by thirty-one exempt members of the Section.

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Richland, Washington
July 8, 1955

MANUFACTURING DEPARTMENT
REACTOR SECTION
MONTHLY REPORT
JUNE, 1955

I. RESPONSIBILITY

There were no changes in Reactor Section responsibilities during June.

II. ACHIEVEMENT

A. Operating Experience

The continued high frequency of slug failures, dropping of 3X system balls at F Reactor, process tube leak testing programs, the start of the horizontal rod replacement outage at D Reactor, and continued large amount of charge-discharge time required by the low concentration program were the major factors affecting time operated efficiency, which was 77.3 per cent, approximately two per cent below the previous month.

Total and plutonium input productions were 114.9 and 114.7 per cent of forecast, respectively. Forecast was exceeded due to higher than anticipated levels and efficiencies, and to postponing a horizontal rod replacement outage.

Thorium input production was 142.2 per cent of forecast as the result of cancelling scheduled June discharges of this material. Production charged to thorium irradiation at C and H Reactors was 3.8 and 3.2 per cent, respectively.

Plutonium megawatt day output production was 142.9 per cent of forecast due to a discharge at KW Reactor which had been scheduled

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A. Operating Experience (Continued)

for July, and to increased discharges to compensate for longer basin cooling time.

Production, low and the D Reactor pilot program concentrations remained unchanged, with 372 and 55 tons of low and production concentration material discharged. The latter figure includes 3 tons from D Reactor at approximately base goal plus 400 megawatt days per ton.

Established maximum reactor operating levels, excluding burnout, were increased a total of 80 megawatts, 45 at DR Reactor, 15 at KE Reactor and 20 at KW Reactor. At DR Reactor, flattening improvements resulted in the increase, while at KE and KW Reactors long term gains were responsible.

Twenty-eight slug failures occurred as detailed below.

	B	C	D	DR	F	H	KE	KW	Total
Eight-Inch Regular		4	9		2	1			16
Production Test		4*				5**			9
"C" Material		1							1
"J" Material		2***							2
	0	11	9	0	2	6	0	0	28

* One from Production Test 105-552-E "Corrosion Test of Zirconium Canned Slugs."
Three, including one unconfirmed suspect, from Production Test 105-578-A "Irradiation of Unbonded Slugs."
** Five "J" material failures occurred in one tube under Production Test 105-567-A "Preliminary Irradiation of J-Q Columns."
*** Both "J" material failures occurred in one tube.

Reactor outage time required for removal of failures was 398.4 hours.

1. Statistics

Operating statistics are summarized in the table on Page 3.

2. Activities

D Reactor was shut down on June 26, for a two week horizontal rod replacement outage. At month end, work was progressing satisfactorily. Other reactor work scheduled during the outage included removal of discharge area catwalks, rewiring of the discharge elevator, and installation

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1. Statistics

	B	C	D	DR	F	H	KE	KW	Total or Average
Reactor Time Operated Efficiency (%)	85.5	69.5	60.5	93.0	50.6	77.2	93.9	88.1	77.3
Reactor Outage Time (Hrs)									
Plutonium Production	104.7	147.6	284.2	44.7	342.5	141.5	18.7	2.0	1085.9
Special Irradiations and Tests	-	72.0	-	6.0	13.0	22.4	25.3	84.0	222.7
Total Outage Time	104.7	219.6	284.2	50.7	355.5	163.9	44.0	86.0	1308.6
Unscheduled Outage Time (Hrs.)	-	219.6	142.6	3.1	355.5	114.8	44.0	2.1	881.7
Metal Discharged (Tons)	46.1	112.6	16.9	36.6	52.8	53.6	-	108.6	427
Water Quality (ppm Turbidity)									
Raw Water - Average	24	20	27	25	19	20	28	29	
Raw Water - Maximum	54	44	57	54	47	47	61	66	
Process Water - Average	.005	.005	.005	.004	.006	.005	.004	.005	
Process Water - Maximum	.008	.008	.008	.006	.008	.007	.009	.009	
Water Pumped (MM Gals)									
Bldg. 190 to reactor	1888	2782	1711	2065	1240	1918	5413	5063	22080
Bldg. 182 to 200 Areas	360		134		-	-			494
Bldg. 181	5732		4641		1540	2283	5590	5348	25134
Steam Generated (MM Lbs)	146		209		91	101	231	207	985
Coal Consumed (Tons)	9191		12700		6407	5851			34149
Oil Consumed (M Gals)							215	194	409

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A. Operating Experience

2. Activities (Continued)

of poison column control facilities. At the D Water Plant, the Building 182-D reservoir was drained and cleaned, and inlet screens and pump suction flumes were repaired.

Spring runoff raised the level of the Columbia River 15.3 feet during June to a crest level of 407.6 feet at 100-B Area on June 29. Although raw water turbidity remained relatively low, 13 to 54 ppm, large amounts of debris necessitated an increase in the frequency of intake screen cleaning. Production of uniform high quality process water was maintained.

Charge-discharge activities associated with major irradiation programs included discharge of one tube of J-Q material at C Reactor. The tube was recharged with uranium. The month-end balance of J-Q tubes at C and H Reactors under the major J-Q program was 62 and 51, respectively.

The shipment of "J" material from DR Reactor to Arco, Idaho, was suspended from June 2 to 20 to provide additional cooling time. When shipping was resumed, 20 casks containing 2,800 pieces were shipped.

Nine mint shipping casks were received from Savannah Works on June 3, and acceptance tests on cask handling equipment is in progress. Minor equipment modifications will be necessary.

The following table indicates activities during June associated with special irradiations other than the J-Q program noted above:

	Tubes Charged	Tubes Discharged	Casks Shipped
Production Tests	8	7	2
Mint (flattening)	5	5	-
Chemical 10-66	-	1	-
Total	13	13	2

B. Equipment Experience

Sixteen reactor scrams occurred, of which 12 were caused by normal Panellit system variables. One scram at KE Reactor resulted from a low level pile trip which occurred during a voltage adjustment prior to by-passing the equipment. KE Reactor was scrammed twice due to high pressure trips resulting from pressure manipulations at the Building 1706-KE recirculation facility. C Reactor was scrammed once due to a Building 190-C turbine trip. Total outage time attributed to these scrams was 52.4 hours.

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B. Equipment Experience (Continued)

On June 10, while water pressure was being lowered normally for the discharge of a rupture, 3X system balls were released from all hoppers except one which was locked out. Following a three day cooling period, ball recovery was completed satisfactorily. Causes of the incident were determined to be breakdown of cable insulation which caused a short circuit and erratic operation of relays. Approximately 146 hours of outage time were required for removal of the balls.

Thermobulb failures at KE and KW Reactors were four and 31, respectively, making totals of 118 and 109 that have failed since startup.

Horizontal rod work and experience included:

a. At H Reactor, rods Nos. 6 and 9 were returned to service following removal of thimbles and installation of new-type thimbleless rods.

b. At B Reactor, rod No. 6 was removed from service because of a water leak.

c. An inspection of new thimbleless rods installed in April at DR Reactor revealed that no additional scratching of the rods had occurred after the initial scratching reported last month.

B, D, and H Reactors were each partially leak tested as the result of abnormal water collection rates. No leaking tubes were found at B Reactor, two leaking tubes were found at H Reactor, and two tube leaks and three Van Stone leaks were found at C Reactor. At month end, water collection rates at these reactors had returned to normal. Outage time involved in leak testing amounted to approximately 66 hours.

All front face pigtails at KE and KW Reactors were inspected for extrusion, with no evidence found. Nine prototype "Resistoflex" pigtails were installed on non-uranium bearing tubes at KW Reactor for evaluation.

Panellit gauge reliability checks at all reactors revealed 63 faulty trips:

Reactor	High Trips	Low Trips	Misc.	Total
B	4	3	0	7
C	0	2	1	3
D	0	0	0	0
DR	1	0	0	1
F	5	0	0	5
H	8	1	0	9
KE	18	11	0	29
KW	7	2	0	9
Totals	43	19	1	63

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B. Equipment Experience (Continued)

The average of 7.9 failures per reactor represents a slight increase over the previous month. However, KE and KW Reactor gauges were not checked in May.

The two traveling screens at the Building 181-KE raw water intake failed on a scheduled periodic startup on June 18. Excessive accumulation of silt and debris caused the failures. The No. 1 screen was cleared and placed in service the next day, but the No. 2 screen was damaged, and removal of the underwater portion for repair and replacement of parts was necessary. Repairs were completed and the screen was ready for use at month end.

Considerable difficulty has been experienced with breakage of internal parts of the 30 inch backwash valves at both KE and KW Reactors. Currently two valves are out of service and 12 other valves are leaking significantly. Vendor representatives are studying the problem, and replacement parts are on order.

C. Improvement Experience

The most significant Production and Process Tests are reported below, together with other items of "Improvement" significance.

PT-105-567-A (Preliminary Irradiation of J-Q Columns)
One tube was discharged on June 5 at an exposure of 167 megawatt days (96 percent of goal) due to rupture indications. Examination of the slugs revealed that five "J" material pieces had failed. Based upon this, the remaining eight tubes of the original 13 tube loading were discharged at an average concentration of 171 megawatt days.

PT-105-579-A (Quantity Irradiation of J-Q Columns)
One tube was discharged at C Reactor and recharged uranium. The month end balance of J-Q tubes under this test was 62 at C Reactor and 51 at H Reactor.

PT-105-7-MR (Irradiation of High Quality Production Uranium Slugs)
One of the 10 tubes under this test was discharged due to high temperature and rupture indications which were not confirmed by inspection of the slugs. The remaining nine tubes now average 1200 megawatt days per ton.

PT-105-354-E (KAPL-120 Recirculation Loop)
The in-pile tube of this facility was installed at H Reactor, and cooling water was provided. Reactor scram instrumentation was supplied, and other installation work is continuing.

C. Improvement Experience (Continued)

PT-105-546-E (The Effect of Helium on D Pile Distortion)
This test, which has been in effect for approximately six months, and which provided helium concentrations of 55 to 65 percent, graphite temperatures between 460 and 500 C, and a maximum outlet water temperature of 110 C, was concluded June 27.

PT-105-604-A (Reducing Side Shield Temperatures by Fringe Poisoning)
Eight tubes of 10-66 material were charged in vertical row 96 (extreme far side) at H Reactor to determine the reduction in shield temperature resulting from a poison blanket around the active core. Five tubes of "C" material were charged to compensate for the reactivity loss.

Seven revised Process Standards - Reactor were issued. These were Standards titled: "Power Level Monitoring - Proportional Counter and Galvanometers," "Number of Inoperable Rods and Ball 3X Hoppers During Reactor Operation," "Number of Inoperable Rods and Ball 3X Hoppers During Reactor Shutdown," "Ball 3X System," "Ruptured Slug Detection," "Distortion of Graphite Moderator, Process Tubes, and Reactor Shields," and "Handling of Irradiated Enriched (U-235) Slugs." The most significant change accomplished by these revisions involved a decrease in the number of Ball 3X hoppers permitted out of service at the K Reactors during operation and shutdown to meet the requirements of the current enrichment program.

At the DR Reactor, a nul-balance amplifier, installed on the Brown recorder used for recording individual process tube outlet water temperatures, improved the accuracy of temperature traverses and facilitated the monitoring of hot tubes during startup.

The use of colored aluminum dummies placed on top of buckets of slugs to distinguish high and low concentration material from the time of pickup until they are placed in 200 Area dissolvers is being investigated in an attempt to insure positive visual identification.

Personnel in the Reactor Section engaged in work which might be expected to result in inventions or discoveries have reported that no inventions or discoveries were made during the period covered by this report.

D. Events Influencing Costs

Reactor Section costs in June are anticipated to be approximately the same as in May. Factors adversely affecting costs in June included the continued high frequency of slug failures, the extended outage at F Reactor, and a 24 percent increase in the combined costs of water treatment chemicals as necessitated by the seasonal decline of raw water quality, and additional alum feed required for pH control by revised Process Standards as noted last month.

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D. Events Influencing Costs (Continued)

Beneficial effects on costs were limited primarily to a 12 percent decrease in combined fuel costs resulting from a reduced steam demand based partially on seasonal changes, and partially on the D Reactor horizontal rod outage.

Preliminary estimates indicate that both plutonium irradiation and total irradiation unit costs will be approximately three percent higher than the May unit costs. Since June total costs are expected to be approximately the same as in May, the anticipated unit cost increase can be attributed to an approximate three percent decrease in production in June as compared to the May record production.

E. Plant Development and Expansion

1. Project Status

The most significant Reactor Section project activity is reported below. Further details concerning projects may be found in the report, "Status of Reactor Section Projects, Informal Requests and Budget Items," F.A.R. Stainken to W.K. MacCready, dated 6-20-55.

CA-431 (100-C Area)
Four replacement half rods for C Reactor are now on the plant. The remaining 17 rods, including spares, are expected to be received early in July. The schedule for installation of these rods is now under study by the Reactor Section Expansion Liaison Unit.

CA-512 (100-K Plant)
One failure of the new type interim bulb for effluent water temperature monitoring has occurred. However, it has not been determined if the bulb or cable connector is at fault. The Engineering and Manufacturing Departments have concurred in the adoption of a Teflon tube, stainless steel wire braid reinforced, front face connector for replacement of present K Reactor connectors. The purchase order for the connectors has been placed, and delivery is expected in approximately two months. Installation will be made by Minor Construction forces.

CG-558 (Reactor Plant Modification for Increased Production)
The proposed solution for eliminating the scratching problem on new rods includes use of pile graphite for bearing surfaces, bearing relief to reduce torsional force, rod burnishing with Molykote, and installation of a graphite follower to maintain a seal on twisted rods. These measures will be followed in all remaining rod installations. Poison column facility hydromotors

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1. Project Status

CG-558 (Continued)
and instrument panels are on plant in sufficient quantities so that no delay in the installation of these items is anticipated. The project proposal requesting funds to modify 100-F and H Area facilities has been approved by the Engineering and Manufacturing Departments, and was forwarded to the Financial Department.

2. Plant Engineering

A number of engineering and development studies were active in the Section during June. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in document HW-37778. Several items of interest are reported below.

A task force, composed of members of the Process, Maintenance and Operations Sub-Sections is conducting an extensive study of process tube removal methods with the aim of improving removal equipment and procedures. Current work is directed toward determining the optimum shape for a tube splitter, development of winches for front and rear face use (the rear face winch to pull the broaching tool and replacement tube through the channel simultaneously), design of a compact cable decontaminator, and development of supplemental communications equipment to improve front to rear face contacts.

A detailed study of the by-pass switches in the reactor safety circuits was started to determine the adequacy of the switches from both safety and operational aspects. The need or justification for each individual switch will be determined.

Development of a new type nozzle to permit tube replacement without nozzle removal continued, with fabrication and testing of a prototype rear nozzle. Nozzle "O" rings with an approximately square cross section have been tested and showed no significant wear after having 300 feet of rough dry tube pushed through.

F. Significant Reports

1. Routine

Monthly operating reports issued for May were:

HW-36928-A	Reactor Section	W. K. MacCready	6/7/55
HW-37175	Operations Sub-Section	J. H. Warren	6/1/55
HW-37101	Process Sub-Section	O. C. Schroeder	6/1/55
HW-36970	Projects and Personnel Development	F.A.R. Stainken	6/1/55
HW-37042	Radiation Monitoring Sub-Section	P. C. Jerman	6/3/55
--	Maintenance Sub-Section	E. E. Weyerts	6/3/55
HW-37032	Power Sub-Section	J. C. McLaughlin	6/3/55

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F. Significant Reports

1. Routine (Continued)

Other routine reports issued during June included:

HW-37438	"Monthly Progress Report, Reactor Section Expansion, June, 1955"	J. P. Langan	6/24/55
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	F.A.R. Stainken	6/20/55
HW-37023	"Reactivity Balance and Associated Data - Period May, 1955"	A. P. Vinther	6/1/55

2. Non-Routine

HW-36659	"Economics of Charge-Discharge While Operating - 105-C Reactor"	G. F. Mader	6/30/55
HW-36665	"Survey of Ball 3X System"	G.E. Turner	5/16/55
HW-36718-RD	"Interim Report Production Test 105-8-MR, Supplement A, Uranium Charging During Reactor Operation"	C. W. Botsford J. E. Robb R. D. Schilling	5/20/55
HW-34363	"Production Test 105-11-MR, Determination of C Reactor Scram Transient Curves"	A. P. Vinther	5/9/55
HW-37150	"Outage Time Economy"	A. P. Vinther	6/2/55
Conf.Undoc.	"Review of Nuclear Safety Aspects of Reactor Operation"	W. K. MacCready	6/3/55
Conf.Undoc.	"Fuel Element Rupture Problem"	W. K. MacCready	6/6/55
Conf.Undoc.	"Charge-Discharge Facility for Metal Exposure Testing Program"	W. K. MacCready	6/21/55
Off.Use Only	"Interim Report - Reactor Water Leaks"	W. K. MacCready	6/20/55
—	"A Study of the Dose Rates Encountered While Handling 105-C Reclaimed Dummies"	C. J. DeBevec	6/27/55
—	"100 Area Master Evacuation Plan"	W. K. MacCready	6/10/55

III. PERSONNEL

A. Organization

There were no appointments in the Reactor Section during June.

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	2	2	0
Operations	372	372	0
Maintenance	619	631	+ 12
Projects & Personnel Development	44	46	+ 2
Power	484	483	- 1
Process	73	76	+ 3
Radiation Monitoring	83	86	+ 3
Section Total	1677	1696	+ 19

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B. Force Summary (Continued)

Changes during June included 18 transfers into the Section, four transfers out of the Section, nine new hires, five terminations, three reactivations, and two deactivations.

C. Safety Experience

There were no Major or Sub-Major Injuries in the Reactor Section in June.

D. Radiation Experience

There were no Class II and two Class I Radiation Incidents. Class I Incident No. 469 occurred at F Reactor on June 12, and involved two Maintenance Sub-Section employees who were making repairs to the 3X ball collector in the work area without radiation monitoring. Class I Incident No. 473 occurred at H Reactor on June 13, when a glass bottom viewer was removed from the storage basin without monitoring. Complete details on these incidents can be found in documents HW-37812 and HW-37813, respectively.

The possible Class II Incident reported last month was determined to be a Class I Incident, No. 477, when it was found that the employee did not recieve the dose indicated by the badge film. Details of this incident are contained in document HW-37476.

E. Personnel Activities

At month end, 10 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 3 of these are on assignment under the rotational training program.

A talk, titled "Some Items of Interest About Hanford Atomic Products Operation," was presented to the East Lions Club of Wichita, Kansas, by P. R. McMurray, Operations Sub-Section.

Six information meetings for non-exempt Reactor Section employees were presented by J. H. Warren and E. E. Weyerts. Subjects discussed were the K Reactors and Maintenance Sub-Section organization and functions.

J. G. Myers, Radiation Monitoring Sub-Section, attended the Health Physics Conference at Ohio State University, Columbus, Ohio, June 13 to 15.

F. A. R. Stainken, Projects and Personnel Development Sub-Section, on June 3, recruited technical personnel from among members of the army soon to be discharged from Dugway Proving Grounds, Dugway, Utah.

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E. Personnel Activities (Continued)

Training of the first four of eight 100 Area rescue crews was completed. Training of the other four crews will be accomplished in the fall.

A "Reactor Section General Training Guide For New Exempt Personnel" was issued for use in the Section.

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Richland, Washington
July 8, 1955

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
JUNE 1955

I RESPONSIBILITY

Responsibilities of the Separations Section were unchanged during the month of June, 1955.

II ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	June		May	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	108	2	102	1
Charges completed in Conc. Bldgs.	108	2	97	1
Special charges - Conc. Bldgs.	3		2	
Charges completed-Isolation Bldg.	83-T	2	84-T	1
Average Waste Losses, %	3.6		3.9	
Special charges-Isolation Bldg.	3		7	
Material balance, %	99.1		99.0	
Yield through Process, %	95.5		95.1	
Average cooling time (days)	112		99	
Minimum cooling time (days)	101		92	

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b. Redox Operations

	June	May
Equivalent charges started	311.1	492.2
Charges completed	307.7	469.0
Tons Uranium delivered to storage	146.9	256.2
Average Production Rate per operating day, Tons	8.4	8.4
Average Daily Operating Rate for the month, Tons	4.9	8.3
Average yield, %		
Uranium	99.4	99.3
Plutonium	97.2	96.9
Total Waste Loss, %		
Uranium	0.99	0.43
Plutonium	0.96	0.87
Average cooling time, days	100	123
Minimum cooling time, days	86	106
Percent down time	41.7	2.0

c. 231

	June	May
Batches started	114	102
Batches completed	118	91
Batches awaiting processing	8	7

d. 234-5 Operations

	June	May
Batches completed through Task I	236	290
Batches completed through Task II	234	288
Runs completed through Task III	121	150
Waste Disposal (Units)	10.4	10.4

e. UO_3 Operations

	June	May	To Date
Uranium drummed, Tons	281.47	394.36	10,011.19
Uranium shipped, Tons	339.08	339.92	9,972.75
Average cooling time, days	106	129	
Minimum cooling time, days	92	112	
Waste loss, %	0.02	0.02	

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f. TBP Operations

	June	May	To Date
Tons received from Metal Removal	133.65	154.19	5,550.63
Tons shipped to UO_3 Plant	134.86	141.07	5,364.92
Average Production Rate per operating day, Tons	4.89	5.40	
Average Daily Operating Rate for the month, Tons	4.50	4.55	
Average yield, %	95.00	96.01	
Total Waste Loss, %	3.85	4.85	
Ratio Actual Waste Volume returned to Theoritical Volume	0.60	0.56	
Percent Down Time	8.0	15.81	

g. Power

	200 East	200 West
Raw water pumped, gpm	3 448	8 205
Filtered water pumped, gpm	531	1 164
Steam generated, lbs/hr	49 956	157 569
Maximum steam generated, lbs/hr	210 000	216 000
Total steam generated, M lbs.	35 968	113 450
Coal consumed, tons (est.)	2 406	7 063

h. Waste Storage

	Equivalent Tons U	
	June	May
Metal Waste reserve storage capacity - T Plant	190	203
1st Cycle reserve storage capacity - T Plant	315	468
Metal Waste reserve storage capacity - B Plant	685	685
1st Cycle reserve storage capacity - B Plant	74	74
Redox Waste reserve storage capacity	546	679

2. Activities

a. Redox Processing

The extraction batteries operated at a combined first cycle feed rate of 9 tons uranium per day from the beginning of the month until June 11. During this time, it was necessary to reduce the rate to the 1S column because an apparent plug in the letdown valve restricted aqueous throughput. The 1A column rate was raised to compensate for the reduction thus permitting the overall plant rate to remain constant. On June 11, the overflow line between the final plutonium concentrator (L-3) and the receiver (L-4) became plugged forcing a plant shutdown for 22 1/2 hours

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a. Redox Processing (Continued)

while repairs were effected. After startup, rates were continued at 9 tons per day until depletion of adequately decayed metal signalled the beginning of a planned outage for crane decontamination and repairs on June 13. The plant remained down until June 25. During this period maximum effort was expended decontaminating the 60 ton crane to permit replacement of an impact wrench which broke shortly before the shutdown, and to allow much needed lubrication and inspection of vital crane components. The L-3 to L-4 overflow line which again plugged just as the shutdown started, was replaced with a line more adaptable to drainage and back flushing. After startup on June 25, rates were held to 6 tons per day until June 27 while recycle, accumulated during the shutdown, was processed in the first head end batches. Rates were raised to 8 tons per day on June 27 where they were held until month end. Higher rates were not feasible since heel removal in the dissolvers (in preparation for processing low MWD metal) restricted metal throughput rates.

b. Metal Recovery

1) TBP Processing

High rates up to nine tons per day were achieved during the first half of the month following correction of the waste loss problem which appeared late in May. On June 16 high gamma product began appearing and problems arising from this source continued throughout the remainder of the month despite the steps taken to improve decontamination efficiency. The break-through of fission products, notably Zirconium, Niobium and Ruthenium, was attributed to the unexpected failure of the flowsheet to remove these elements from the feed stream containing approximately 50% of U Tank Farm uranium, 17 months of age compared to the older 2 1/2 year metal previously processed. The possibility was not overlooked, however, that the upset was due to some unknown cause. Adjustments were made to the scrub streams, centrifugation of first cycle product was employed, the organic was caustic and acid washed; all to no avail. Finally on the 22nd a vigorous flush of all extraction columns was made. Rework of the final second cycle contaminated product was attempted but with little success. Finally, the product was shipped to the UO_3 plant and subsequently sent to Redox for treatment in the silica gel facility which is an effective zirconium, niobium remover. At monthend the system was in the final stages of clearing itself of all TX-U blend material preparatory to adopting a straight TX feed in an effort to determine conclusively whether or not U Tank Farm metal is the offender.

2) UO_3 Processing

Production in the UO_3 Plant was limited by the TBP process problems and a 10 day plant shutdown at Redox. 281 tons were produced; 33 tons short of the commitment.

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3) Waste Metal Removal

Adequate TBP Plant feeds were maintained all month. Feed consisted mainly of blends of TXR material (min. age 2 1/2 years) and UR material (min. age 17 months). At month-end, due to difficulties encountered in TBP Plant, only TXR material was being used for feed material. The 108-BY tank which contained approximately 600,000 gallons of scavenged waste was cribbed.

c. T Plant Processing

T Plant production was curtailed during the first ten days of the month due to operational and equipment difficulties. In spite of these difficulties new records were established in the tons of metal dissolved, the number of runs started and the number of runs shipped, to maintain a production of 94.74% of the schedule and 120% of the commitment.

Control of the I^{131} emission from the T Plant ventilation stack continued to be a problem. The I^{131} emission averaged about 1.13 curies per day. During the latter part of the month, processing of 260 MWD per ton uranium was started, and no process difficulties were encountered.

d. Isolation and Metal Fabrication

Processing activities in the Isolation Building were relatively normal and activity in metal fabrication was concentrated upon meeting the unusually high production schedule. Process material on hand and in feed storage made it possible to continue the operation of the BMA Line in spite of the ten-day shutdown of the Redox facility.

3. Special Operations

a. Waste Evaporators

First cycle evaporator bottoms were processed in June in the West Area evaporator. For a total feed of 257,000 gallons, a reduction of 25.7 percent was achieved.

b. Plutonium Recovery, Metal Fabrication

The recovery of process material from skulls was maintained at a high level. In addition, smaller amounts of briquetts, buttons, and castings, which were determined to be off-standard, were also recovered.

4. Schedule Variance

Redox production was 5 percent less than forecast due to completion of processing of the available 90 day cooled metal and due to difficulties encountered in repairing the highly contaminated crane.

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4. Schedule Variance (Continued)

Although the production commitment was exceeded by approximately 20 percent in T Plant, problems associated with process and equipment curtailed plant production to 97% of forecast.

In the Metal Recovery Plant, production forecasts were not met in either TBP or UO_3 Plants due to process problems in TBP Plant and lack of feed material to the UO_3 Plant. Twelve carloads of UO_3 were shipped this month.

No difficulty was experienced in meeting the production commitment for off-site shipment of nitrate from the Isolation Building. The production schedules for metal fabrication were exceeded, with a new production record being established for fabricated material. This new record, which exceeded past performance by 50%, was particularly noteworthy since the record for the previous month had exceeded all previous records by 50%.

B. Equipment Experience

1. Operating Continuity

Down time in Redox amounted to approximately 300 hours due to a plugged line between the final plutonium concentrator (L-3) and receiver (L-4) and because of a planned outage for crane decontamination and repair brought about by a lack of 90 day cooled metal. A mechanical efficiency of 58.3% was achieved for the month.

Down time of 57.5 hours was experienced in second cycle TBP Plant operations to allow flushing of the system as the result of high gamma product problems which developed late in the month. As a result of decontaminating difficulties all production for the month was essentially confined to the first 19 days.

In T Plant the operating continuity was impaired in varying degrees by equipment failures: however the loss of over-all production from these causes was minimized to some extent due to the coincidental slowing of the process due to acid washes, equipment flushes and high volume runs.

In Z Plant there were no equipment failures which seriously interfered with the continuity of operations during the month.

2. Inspection, Maintenance and Replacement

a. Cell Equipment Replacement - Redox

During the planned outage between June 13 and June 25, seven new thermohms were installed in canyon vessels to replace those which had failed in service. A new weight factor, specific gravity jumper was installed in the waste concentrator (D-12). Also replaced during this period was the plugged L-3 to L-4 (Concentrator to receiver) line.

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b. 60 Ton Crane - Redox

The 60 ton crane was decontaminated using a high pressure solvent stream to the point that lubrication and inspection of most critical parts could be effected. In addition the left hand auxiliary impact wrench was replaced.

c. Cell Equipment Replacements - T Plant

Major mechanical problems in T Plant consisted of failure and replacement of one centrifuge, four tank agitators, transfer line in the Concentration Building, and a number of canyon cell jumper assemblies. In addition, the 4-5L silver reactor was recoated.

d. Furnace Replacement - Metal Fabrication

Major maintenance encountered during the month in Z Plant was replacement of three of the Task II Furnaces and the heating elements in all four of the Task IV Furnaces.

C. Improvement Experience

1. Process Tests and Revisions

a. Iodine Emission

Redox

No significant iodine emissions occurred during the period. On June 9 to 10, continuous sampling of the off gases was made from dissolver A-2, Silver Reactor A-3 and Filter A-4 during dissolution of a special run consisting of metal cooled only 86 days. Emission rate during coating removal was measured at only 0.0004 curies per hour, during the first cut at 0.013 curies per hour, and during the second cut at 0.010 curies per hour. Data from a similar test using 99-105 day metal is not yet available.

T Plant

Control of Iodine^{131} emissions from the T Plant ventilation stack, continued to be a problem during the month. Iodine^{131} emission during the period May 19 through June 20 averaged 1.13 curies per day, with all dissolvers operating to full capacity. Production was not impaired except for the necessity of regenerating one (4-5L) silver reactor column. Observations have indicated the reactor temperatures may be higher than indicated and thereby contributing to I^{131} emission since a noted improvement was realized when the 3-5R reactor inlet temperature was reduced by 20°F. As a further check on this, recording wattmeters were installed on the three heater power supplies. Results of the meter tests are not yet available.

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b. Waste Scavenging - Metal Recovery

TBP in-process waste scavenging was continued with favorable results this month. Approximately 600,000 gallons of scavenged supernatant were pumped from the 108-BY tank to the #3 BY cavern. The most recent tank to receive TBP scavenged waste (106-BY) has been settling prior to sampling, testing and evaluation.

2. Inventions and Discoveries

Papers are being prepared in accordance with the "Patent and Invention" procedure for two potentially patentable items submitted by Lester J. Bonney, W-16814. Evaluation is underway for both items. The "Bonney Type Gasket Retainer" is a device for regasketing by remote methods, and the "Bonney Type In-Line Orifice Cleaner" is a device for cleaning or unplugging an orifice used to control flow of liquids or gasses.

D. Events Influencing Cost

June expenditures, for the Separations Section, are expected to be approximately six percent below the May level. This decrease in costs is due primarily to the decreased essential material requirements associated with the lower production rate at Redox and the year end adjustment for over liquidated costs. This year end adjustment will amount to a credit of approximately $70,000 (Maintenance $40,000, Analytical $10,000, Project and Personnel Development $10,000 and Space Occupancy $10,000).

E. Plant Development and Expansion

1. Project Status

a. CA-513-A - Purex

Construction status is 99.7 percent complete. Minor Construction has completed 47 of the 106 design changes scheduled to date. During the month 31 new design changes were issued. A revision to the project proposal requesting three million dollars is being circulated for approval. The revised project proposal recommends capacity increase to 2.75 times design rate; an additional canyon crane; additional continuous monitors for process streams; continuous iodine monitors in the sample gallery; backup iodine removal facilities; a burial garden; circulation of underground waste storage tank contents; improved control of process concentrators; and additional crib capacity.

Flushing of buried piping from P & O Gallery wall to the cells is 90 percent complete. Work remaining to be done consists of flushing piping in the hot pipe trench and waste lines from the building to underground storage.

Phase I operatibility, or proof of operability of components, is expected to be complete by July 10. It is then planned to begin

a. CA-513-A - Purex (Continued)

Phase II operability to demonstrate continuous operation of the canyon equipment as a system and to obtain capacity data. The possibility of making a preliminary acid flush in conjunction with Phase II work is being explored.

b. CG-598 - Purex

Contract negotiations with Lummus Company are in progress. The scheduled completion date of April 15, 1956 is dependent upon award of this contract since equipment procurement and fabrication are limiting items. Minor Construction started work on structural additions to the 202-A Building on May 15.

c. CG-613 - UO_3 Expansion

Minor Construction began relocating existing underground lines on June 17 to activate this project. Site preparation was started and this phase should be complete by 7-14-55 so that the lump sum contractor can begin laying building foundations.

Detail design is approximately 2-3 weeks behind schedule. A total of $1,500,000 has been authorized of the $3,600,000 required for the project and it is expected that this will provide funds immediate for procurement.

d. CG-536 - Redox

Eight of the 27 startup items for the 205-S Silica Gel Facility have been completed. Calibration of tanks and instruments is in progress. Ready-for-Operation date will be about July 15.

e. CG-496 - Recuplex

Recuplex was started up with radioactive stand-in material on June 7. Operation of the equipment has been satisfactory and no major difficulties have been encountered. Completion of the last stand-in runs and flushing of the equipment is scheduled for the last week in June. Receipt of plutonium bearing solution is tentatively scheduled for July 5. Installation of contamination control barriers was completed on June 22nd.

f. CG-603 - 4X Program

Rehabilitation of B Plant by Minor Construction is progressing. Acceptance test procedures for equipment in 221-B, 224-B, and 271-B Buildings are in the process of preparation and it is expected that tests will be started early in July. The B Plant work included in the Phase I portion of Project CG-603 is approximately 69% complete.

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2. Plant Engineering

a. Standards

The analytical service standard for the Redox plant was revised. Revised essential materials standards for T Plant and the TBP Plant were developed from revised chemical flowsheets. The revised labor standard for the 222-S laboratory was completed.

b. Work Simplification

Twenty-six Separations personnel completed the third series of Work Simplification Round Tables this month. A total of 26 proposals for improved utilization of manpower or materials has been made to date as a result of the 62 studies made by the conferees. The potential annual savings from these proposals is $42,300. Before the fourth series of Work Simplification starts in September, the course will be condensed and revised. It is planned to schedule the conferences so that shift workers may participate.

c. Preventive Maintenance

Evaluation of the preventive maintenance systems in the Separations plants was completed as the first phase of a long range program to improve cost control in maintenance. The second phase, devising and installing a simple, effective preventive maintenance system in the plants, has begun. Initially this is being done in the Redox plant where a model system for the Section will be established. The detailed operating method for the system, the records to be kept, and the plant equipment to be included are being developed.

d. Engineering Assistance

1) Air Filter Testing

Destructive testing of fire proof type C.W.S. filters under stimulated operating conditions has passed through the moisture stage. Four types have been subjected to high humidity atmospheres. One type, the "MSA High Temperature Ultra Air Space Filter", is standing up very well. Other tests are continuing on stimulated process atmospheres.

2) Cask Car Study

A report of findings of recent monitoring surveys was made to a joint meeting of personnel representing the Reactor and Separations Sections. A five step method of solution of the problem was agreed upon. These include (1) installation of hinged lids on cask cars, (2) use of drip pans to protect car decks at 100 Area basins, (3) equal contamination release limits for both the

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2) Cask Car Study (Continued)

100 and 200 Areas, (4) better scheduling of car flushes, and, (5) adoption of a two-minute drainage period when buckets are removed from the cars during charging. Excepting the hinged lid installation, these steps were recommended strongly for immediate adoption.

3) Design and Drafting

Progress continues on the over-all as-built drafting program. Items underway are: inert gas systems 234-5 and 221-U cell and trench diagrams.

Preliminary scope package drawings were completed on the following items: off-gas treatment system - T Plant, and 224-T Cell F Isolation equipment.

F. Reports Issued

1. Routine

Number	Subject	Author
HW-37771	Separations Section Redox Plant Sub-Section Monthly Report - June 1955	R.T. Jessen
HW-37781	Separations Section Metal Recovery Sub-Section Monthly Report - June 1955	T. Prudich
HW-37747	Separations Section T Plant Sub-Section Monthly Report - June 1955	C.T. Groswith
HW-37765	Separations Section Z Plant Sub-Section Monthly Report - June 1955	W.N. Mobley
HW-37739	Separations Section Analytical Control Sub-Section Monthly Report - June 1955	L.M. Knights
HW-37755	Separations Section Radiation Monitoring Sub-Section Monthly Report - June 1955	A.R. Keene
HW-37701	Separations Section Projects & Personnel Development Sub-Section Monthly Report June 1955	O.V. Smiset
Official Use Only	Separations Section Power & Maintenance Sub-Section Monthly Report - June 1955	C.P. Cabell
HW-37697	Separations Section Purex Sub-Section Monthly Report - June 1955	V.R. Chapman
None	Status of Projects, Informal Requests, and Budget Items, June 1955	R.M. Shervem
HW-37091	Essential Materials Consumption for T Plant, May 1955	M.A. Thress
HW-37685	Analytical Quality Report - June 29, 1955	D.T. Crawley
HW-37092	Essential Materials Consumption for TBP Plant, May 1955	M.A. Thress
HW-37093	Essential Materials Consumption for Redox Plant, May 1955	M.A. Thress

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1. Routine (Continued)

Number	Subject	Author
HW-37094	Essential Materials ordered June 1 - June 30, 1955	M.A. Thress
HW-37095	Essential Materials Area Report to Cost and Purchasing, May 1 through May 31, 1955	M.A. Thress
HW-37143	Separations Section Waste Status Summary for May 1955	D.E. Peterson
HW-37129	Separations Section Cost and Production Bogey Estimates - January 1954 through June 1954	R.S. Bell
HW-37130	Separations Section Cost and Production Bogey Estimates - July 1954 through December 1954	R.S. Bell
HW-37131	Separations Section Cost and Production Bogey Estimates - January 1955 through June 1955	R.S. Bell
HW-37384	Separations Section Annual Goals 1956	R.S. Bell

2. Non-Routine

None	Analytical Service Standard for the UO_3 Plant	R.H. Silletto
None	Steam Standard for the 221-U Building	R.H. Silletto
None	Analytical Service Standard for the Redox Plant	R.H. Silletto
HW-37413-RD	Essential Material Standard for T Plant	R.H. Silletto
HW-37137-RD	Redox Phase III Capacity	D. McDonald
HW-37323-RD	Six Months Goal Forecast, June 1955	B.F. Campbell
HW-36872-RD	Additional F-10 Facilities, 224-B and T Buildings	D. McDonald
HW-37127	Radiation Incident, Class I, No. 467-R	D.R. Koberg
HW-37370	Radiation Incident, Class I, No. 471-C	D.R. Koberg
HW-37310	Radiation Incident, Class I, No. 470-C	G.E. Backman
HW-37314	Radiation Incident, Class I, No. 474-R	G.E. Backman
None	Concentration Building Essential Material Consumption, May 1955	R.H. Steach
None	Canyon Building Essential Material Consumption, May 1955	R.H. Steach

III PERSONNEL

A. Force Summary

	Start of Month	End of Month	Net Change
Section General	2	2	0
Redox Plant Sub-Section	216	213	- 3
Metal Recovery Plant Sub-Section	270	266	- 4
Z Plant Sub-Section	180	182	+ 2
T Plant Sub-Section	218	217	- 1
Purex Sub-Section	282	286	+ 4

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A. Force Summary (Continued)

	Start of Month	End of Month	Net Change
Power & Maintenance Sub-Section	312	316	+ 4
Projects & Personnel Development	59	60	+ 1
Analytical Control Sub-Section	205	209	+ 4
Radiation Monitoring Sub-Section	174	169	- 5
Section Total	1918	1920	+ 2

B. Safety Experience

There were no major injuries in the Separations Section in May. One sub-major injury was incurred by a Purex Sub-Section employee who sustained a bursting contusion and fracture of the right middle finger and two small abrasions on the left leg when struck by a falling pipe. Details of this are reported in the Sub-Major Injury Investigation No. 277. Until this injury occurred the 200 Areas had operated 188 days without a sub-major injury. At the close of the month, both 200 Areas had operated 610 days without a lost time injury, an outstanding achievement since it involves approximately 7,900,000 exposure man-hours.

C. Radiation Experience

Four Class I radiation incidents occurred and included: (1) a process operator in the 202-S Building was exposed to dose rates to 16 rads/hr while obtaining an F-cell sump sample without adequate monitoring (No. 467-R); (2) waste cartons from the 222-S laboratory building containing contaminated waste with a maximum surface dose-rate of 4.5 rads per hour were inadvertently delivered to the minor construction burning pit with no significant personnel exposure involved (No. 471-C); (3) possible internal deposition of plutonium to a utility operator following a hood 9 TS glove rupture in the 234-5 Building (No. 470-C); (4) batch size was exceeded in the 234-5 Building when without proper analysis, Task II recycle waste was jetted into an RC can already containing an acid flush (No. 474-R).

Daily emission of I^{131} from the T and S Plant stacks averaged 1.1 and <0.1 curies respectively.

D. Personnel Activities

1. Personnel Programs and Training

During the month the training program activities were as follows:

Program	Attendance
For Non-Exempt Roll:	
Orientation	8
GE Selection Evaluation	7 (4 P&M, 2 RM, and 1 Operations)
Nine-week Instrument Training	11

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2. Procurement

At month's end, there are 5 active requisitions on file with Employment, all for secretarial-clerical employees.

3. Visitations

D. McDonald presented a paper entitled "Disposal of Radioactive Wastes at Hanford" at an Industrial Waste Symposium conducted at the University of California on June 17, 1955.

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DRL

July 7, 1955

ELECTRICAL UTILITY SECTION

MONTHLY REPORT

June, 1955

I. RESPONSIBILITY

There was no significant change in Section responsibility during the month.

II. ACHIEVEMENT

A. Operating Experience

Power Statistics (See last page for details)

Plant Contract

Probable time of June Peak . . . . 9:00 - 9:30 p.m., June 25, 1955
Telemetered Peak demand for June ..... 174,000 KW
Probable energy consumption for June ..... 107,735 MWH
Billing demand for June..... 201,000 KW
Actual BPA Metered demand for May..... 175,479 KW
Average Monthly energy consumption this FY thru May. 112,186 MWH
Actual Cost of purchased electricity for May.....$294,104
Actual Cost of purchased electricity for 11 months
of Fiscal Year..... $2,314,574

* * * *

B. Equipment Experience

BPA System

At 8:02 p.m., June 2, system frequency momentarily dropped to 59.62 cycles. Partial loss of McNary generation during a transformer switching operation caused the disturbance.

On June 23, a series of above normal frequency conditions resulted from system disturbances in Montana. The highest figure reached was 60.48 cycles.

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HAPO System

On June 12, a grass fire in the vicinity of the Army's Durand well No. 7, damaged four 40 foot poles on our 7.2 KV line requiring replacement at a cost of $640.00. An Army-AEC investigation stated the probable origin as discarded 'burning material.'

* * * *

Electrical service to the temporary 66 KV line and substation which supplied construction power to the 100-K Areas was discontinued June 20. The line was disconnected at point of tap, approximately 1.3 miles south of 100-K. Dismantlement of the line, substation, and remaining distribution circuits will be done by Minor Construction and an outside contractor.

* * * *

A power outage at Buildings 231-W, 282-W, and part of 283-W was reported at 4:30 p.m., June 22. High winds apparently caused line conductors to short circuit and trip the terminal breaker in substation 252-W. The breaker was reclosed and power restored at 4:42 p.m. There was no production loss.

* * * *

At 8:47 a.m., June 24, 230 KV oil circuit breaker #342 at 151-D opened with a target on the ground directional relay. Reclosure was made at 8:49 a.m. without any effect to loads. Immediately following the incident, the substation operator reported he observed a hawk, apparently in a stunned condition, on the ground in the station yard. Shortly after, it flew away.

Assumption that the bird was the basic cause of the breaker action is difficult to rationalize. Although the relay target indicated that the tripping was initiated by ground fault current, no foreign material which may have been carried into the line by the bird was found; no arc was observed; the breaker on the other end of the line section at 100-KE did not trip; no surge was noted on the system. The relay and tripping mechanism have been checked and found to be in proper condition.

Pending further developments, the conclusion is that the presence of the bird was probably co-incidental, any fault which it might have caused would have been quite evident. That although there is no evidence of a cause for malfunction, the breaker may have opened due to improper mechanical latching; vibration from construction work on the 151-D building may have caused the relay target to drop. The conclusions are based on probabilities, however, the presently available facts allow no other approach.

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C. Improvement Experience

Arrangements were made with the Reactor Section to allow performance of routine operational checks of the 230 KV oil circuit breakers on certain scheduled days of each month.

This maintenance check is not new, but with the addition of more breakers and heavier demands on the system, it was no longer possible to maintain the frequency desired without a fixed schedule.

* * * *

In conformity with current civil defense and evacuation procedures, black-out tripping circuits have been removed from service in the 300, 100-B, 100-D, 100-F Areas, and the Hanford substation. Dim-outs will be accomplished by turning off the street and fence light circuits.

* * * *

D. Events Influencing Costs

The Financial Department's final accounting on the recent inventory of $31,000 value of materials under the custodial responsibility of this Section, reports that accountability control was within 1½%. The variance a year ago was 10% on a valuation of $65,000.

* * * *

Overtime hours expended were approximately 3% of the total regular hours worked.

* * * *

Attendance for the month was 98.52%.

* * * *

The Section will under run the FY 1955 budgeted funds for operations and maintenance by approximately 7%, chiefly due to the inability to obtain qualified personnel for the planned force.

Purchased electricity will under run the budgeted cost by approximately 10% because of the 100-K Areas construction delays and the curtailment of planned operational levels.

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E. Plant Development and Expansion

The possibility of disposing of the remainder of the old North Richland-Hanford 66 KV transmission line by salvage contract was again reviewed with Radiological Sciences and AEC. Potential contamination of the materials would still require daily checking of contractor personnel, equipment, and salvaged material. The AEC states that this requirement precludes selling the facility in place at this time.

Based upon these findings, this Section is preparing an informal request for authorization and funds to carry on the program of clean-up and dismantlement of those structures which fall or become safety hazards, pending the time when the contamination problem ceases to exist.

* * * *

Minor Construction forces have been actively engaged in Project CG-558 work at the 151-D substation building and switchyard. Close surveillance of the work by our people has been necessary due to the potential exposure to high voltage lines and equipment and to relaying equipment from jack hammer vibration.

* * * *

A revised Electrical Utility Section Defense and Evacuation Procedure was written to supplement the newly revised over all Plant Defense Procedure and the individual procedures for Reactor, Separations, and Metal Preparation Sections. The plan will be regularly reviewed with Section personnel.

* * * *

At a meeting with BPA in Portland on June 3, the reactive power question was again discussed. The primary purpose of this meeting was to mutually inform each other regarding tentative scheduling of equipment installation and system loading in order that analyzer board studies may be set up. The major benefits we expect to derive from joint consideration of these collateral problems will be that the resultant studies will help solve our local operating problems generated by the installation of the CG-558 motors and the third 230 KV line. It is becoming increasingly apparent that there are many problems to be resolved. A third meeting is tentatively scheduled for early August.

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Planning is going ahead toward 13.8 KV and 4.16 KV imposed fault testing at 100-K; that is, initial application at KW and retest at KE. It is the intent to coordinate the tests with pigtail work. Some of the prevailing conditions which particularly complicate the arrangements and performance of the tests are:

Difficulty in making arrangements for BPA test equipment and engineers to suit mutual schedules without firm dates.

Both KW and KE are required to be down simultaneously during tests.

Because of the need for full pumping load in the area being tested, the tests can not be performed while the pigtail work is underway.

An interval of three days between tests is required to move and set up the equipment.

The work load for the Substation Maintenance people will be quite heavy during July and August due to extensive deferred maintenance work on 230 KV breakers at 151-B and 151-H while these areas are down for rod work.

* * * *

The applicability of aluminum channel members as replacement material for the wood crossarms in our 230 KV line structures is being thoroughly investigated. The assembled wooden arms kept as spare parts as well as stock material kept as reserve, ages possibly more rapidly than the installed, loaded crossarms in this climate. An assembled wood arm is heavy and unwieldy, yet must be rigged and handled carefully to avoid damage.

Use of aluminum members in 230 KV line structures is not new to the industry. Comparative cost appears to be the major reason there is not wider use.

* * * *

III. ORGANIZATION AND PERSONNEL

A. Organization

None.

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B. Force Summary

	Beginning	Ending	Net Change
Exempt Personnel	17	17	0
Dispatchers	5	5	0
Electricians	12	12	0
Linemen	22	22	0
Substation Operators	31	31	0
Secretary	1	1	0
Stenographer	1	1	0
Clerk	1	1	0
Storekeeper	1	1	0
Draftsman	1	1	0
	92	92	0

A stenographer was transferred to Reactor Section to fill a Secretary "C" position. She was replaced by a rehire.

C. Safety Experience

Three minor injuries were reported.

D. Radiation Experience

No incidents were reported during the month.

E. Personnel Activities

At the June meeting, L. H. Holden assumed his duties as newly elected chairman of the Health Activities Committee.

G. T. Van de Carr, as guest speaker at the Section's monthly informative meeting, discussed the procurement and control of funds used in operating HAPO; and more specifically as related to the requirements of the Utility Section. This is part of a program toward better understanding and awareness of operating and maintenance costs.

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ELECTRICAL UTILITY SECTION

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POWER STATISTICS
ELECTRICAL UTILITY SECTION
FOR MONTH ENDING JUNE 30, 1955

	ENERGY - MW HRS.		MAXIMUM DEMAND-KW		LOAD FACTOR-%	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	26050	26650	44800	46100	78.2	80.3
A-4 Out (100-D)	17560	15680	28100	27300	84.0	79.7
A-5 Out (100-H)	9220	8900	14700	14700	84.3	84.1
A-6 Out (100-F)	7420	6150	15000	13400	66.5	63.7
A-7 Out (100-KW)	20544	19392	36500	33000	75.6	81.6
A-8 Out (200 Area)	6170	5950	9900	10500	83.8	78.7
A-9 Out (100-KE)	20488	21072	32000	32500	86.1	90.0
TOTAL OUT	107452	103794	181000*	177500*	--	--
MIDWAY IN	109371	105265	170400	169600	86.3	86.2
115 KV System (300 Area)						
BB3-S4 Out	2312	2288	4069	4336	76.4	73.3
115-66 KV System						
B9-S11 Out (100-K)	60	12	200	80	40.3	20.8
B7-S10 Out (W. Bluffs)	216	144	675	540	43.0	37.0
Hanford Out (7200 V.)	38	29	--	--	--	--
Hanford In	295	182	1100	800	36.1	31.6
Project Total In	111978	107735	175569*	174736*	--	--

* Denotes Non-Coincidental Demand

Average Power Factor - 230 KV System 86.1

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MANUFACTURING DEPARTMENT
PURCHASING AND STORES SECTION
MONTHLY REPORT JUNE, 1955

I Responsibility

It has been agreed that effective July 1, 1955 Stores will assume custodial control of the Zirconium inventory which was formerly the responsibility of the Engineering Department, Technology Sections.

II Achievement

No appreciable changes in total Section activity occurred during the month. However, the number of emergency requisitions received is still increasing. Activity in Spare Parts reached an all time high with 2065 store orders processed amounting to gross issues of $153,176. However, returns for credit totaled 51 amounting to $18,802 resulting in net issues of $134,374.

	FY 1955			
	April	May	June	FY to Date Average
Purchasing Sub-Section				
Emergency requisitions received*				
Employee & Public Relations	1	1	8	3
Engineering	23	22	32	24
Manufacturing	61	56	76	59
Medical	1	10	6	6
Minor Construction	185	247	238	166
Radiological Sciences	2	7	7	4
Stores	123	86	92	104
Total	396	429	459	366
Average per day	18.9	20.4	20.9	17.4
*Data available for 6 months only.				
Total requisitions**				
On hand start of month	1,047	956	1,039	902
Received	2,786	3,021	3,172	2,591
Placed	2,877	2,938	3,118	2,590
On hand end of month	956	1,039	1,093	903
**Do not include those assigned to AEC, Viz:	472	531	330	470
Number of purchase orders placed				
General Supplies Unit	2,255	1,932	1,950	Breakdown
Process Equipment Unit	725	530	615	Not
Essential Material Unit	34	27	35	Available
Local Purchase	62	64	76	
Total	3,076	2,553	2,676	2,299

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II Achievement - (Cont.)

	FY 1955			
	April	May	June	FY to Date Average
Purchasing Sub-Section (Cont.)				
Value of purchase orders placed				
General Supplies Unit	$ 722,227	$ 559,146	$ 592,101	Breakdown
Process Equipment Unit	856,873	892,954	813,211	Not
Essential Material Unit	644,981	648,358	783,669	Available
Local Purchase	439	501	473	
Total	$2,224,520	$2,100,959	$2,189,454	$2,019,885
Purchase Order Alterations				
Number	220	254	186	181
Gross value	$ 158,839	$ 82,500	$ 100,837	$ 98,771
Expediting *				
Orders on hand start of month	2,585	2,562	2,547	2,379
Orders received	2,530	2,234	2,865	2,305
Orders completed	2,553	2,249	2,609	2,246
Orders on hand end of month	2,562	2,547	2,803	2,438

*Data available for 8 months only

Stores Sub-Section				
General Supplies				
Store orders processed	30,280	29,428	29,719	28,734
Value of issues	$ 336,184	$ 306,149	$ 316,922	$ 311,749
Line items in account	28,698	29,826	30,057	28,734
Back orders on hand	415	383	380	338
Out of stock items	203	223	217	204
Percent of line items out of stock	.7	.7	.7	.7
Spare Parts				
Store orders processed	1,707	1,603	2,116	1,472
Value of issues	$ 108,561	$ 104,398	$ 134,374	$ 99,784
Line items in account	27,855	28,362	29,332	25,975
Back orders on hand	341	345	289	294
Out of stock items	254	298	224	251
Percent of line items out of stock	.9	1.0	.8	1.0
Receiving				
Shipments received	7,194	6,889	7,167	6,667
Receiving reports issued	6,549	5,967	6,963	5,877

II Achievement - (Cont.)

	FY 1955			
	April	May	June	FY to Date Average
Stores Sub-Section				
Excess Material & Equipment				
Received	$ 153,259	$ 45,928	$ 104,182	$ 147,919
Issued to Project	7,082	7,008	3,902	36,218
Shipped off-Project	305,396	53,725	194,738	353,485
Revenue from scrap and surplus sales	$ 20,505	$ 5,290	$ 38,237	$ 21,090
Requisitions screened	2,988	2,875	3,023	2,831
Items screened	8,550	8,089	8,122	8,554
Items furnished	758	841	934	424
Traffic				
Savings				
Rate reductions	$ 2,975	$ 2,092	$ 2,985	$ 3,184
Freight bill audit	1,182	1,769	4,184	1,836
Savings - September 1, 1946 to date $1,952,169				
Money recovered - Claims				
Loss, damage & overcharge	$ 549	$ 33	$ 158	$ 494
Ticket refunds	204	617	203	603
Money recovered - September 1, 1946 to date $209,337				
Work Volume				
Travel requests	159	152	116	141
Reservations made	478	500	249	424
Expense accounts checked	216	210	244	202
Shipments traced	105	103	161	71
Quotations furnished rates and routes	562	637	653	531
Freight bills approved	1,577	1,644	1,722	1,522
Amount*	$ 326,470	$ 337,941	$ 383,509	$ 323,155
Carload shipments received	1,011	1,089	1,090	950

*Data available for 7 months only.

The annual physical inventory of excess material and equipment was completed on June 29 and posted to stock records on June 30, 1955. The physical count and record posting, were accomplished in less than eight hours on each of the above dates, without additional personnel. Both the reduction in excess inventories and improved warehousing conditions contributed to the effectiveness and prompt completion of this work.

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II Achievement - (Cont.)

A value analysis study was completed during the month of 13 kinds of columnar pads maintained in the Stationery and Office Supplies inventory. As a result of the study it was found that 11 kinds of pads could be discontinued from stock and that the remaining 2 types would satisfy all HAPO requirements.

A preliminary investigation was made by personnel of the Purex facility to clarify a question that existed as to the quantity and identification of spare parts and equipment received from Blaw Knox. The results indicated some overages, shortages and mis-identifications. Because of these variances, it was necessary to physically inventory and identify all special control valves, instruments and parts. Spare Parts stock records for the valves were adjusted to agree with the results of the inventory and little variance remains between items and quantities requested and those actually received. The final results of the instrument inventory are not yet known.

Estimates of the value of Special Process Spares ($2,009,578) and Continuity of Operation Spares ($2,107,640) were developed and submitted to Inventory Accounting during the month. These two categories of spares which are currently booked in the Spare Parts Inventory Account 0410, must be segregated and reported by September 30, 1955, to conform with the definitions of spares set forth in OPG 04.11.

Two Surplus and Scrap Sales and two Negotiated Sales were held this month and awards were made by the Commission to the successful bidders. Included in the Surplus Sales were fifty-one pieces of automotive equipment and over 2,000 items of excess material. Surplus Sale #98 consisting of 13 lots of miscellaneous pipe, valves, motors and pumps located at Vernita Orchards was completed during the month.

Safeguards for Stores Inventories were strengthened through an inventory of all keys, door locks, and padlocks charged to Stores. Extra keys and padlocks were taken from personnel who have no need for them. Also, a program to have door locks changed annually was started.

The roof of Building 1166 (Central Stores) is in very poor condition considering that it is less than three years old. In recognition of this, inquiries have been made as to ways and means of correcting the existing condition. Engineering personnel of both General Electric and AEC have inspected the roof and have indicated that repairs are necessary to put the roof in a more satisfactory condition. Repair cost has been roughly estimated at $12,000.

An inspection of the graphite fabrication equipment in the 2101 Building which is the custodial responsibility of Stores, was made during June to uncover any rusting, corroding, or any other damage to the equipment. This inspection, which was made by personnel of 200 Area Power and Maintenance, did not reveal any conditions that required attention.

Interstate truck carriers resumed operations June 13, 1955 after settlement of a truck strike extending for a period of twenty calendar days. Following settlement of the strike, the surge of incoming shipments severely taxed the facilities and personnel of Receiving. With truck carriers idle, L.C.L. and carloading shipments increased sharply. The railroads, faced with this unexpected increase in volume, experienced understandable delays, mixed freight and considerable difficulty in matching freight with bills for delivery. A large increase in

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II Achievement - (Cont.)

over and short reports was necessary to cope with the number of shipments that have been received that do not conform with freight bills. Damage reports have increased, as many shipments showed evidence of inexperienced handling. Despite the complexities caused by this unusual circumstance and the heavy volume experienced, deliveries have been maintained on a fairly current basis.

Status of Essential Material Contracts

General Supplies

RO-16 for one year's requirement of frozen meals. The contract has been fully executed and is now operative.

SO-2, Supplement No. 2 to extend the original IBM contract for another year, and increase the permissible commitment figure to $438,000. The Supplement has been drafted and sent to the vendor for signature.

RO-7, Supplement No. 1 to extend the original American Red Cross contract for another year, and increase the quantity to 600 pints of blood has been drafted and sent to the vendor for signature.

Process Equipment

The Lummus Corporation insisted that the firm price negotiated for the Acid Fractionator had all contingencies removed and they were not willing to accept the price redetermination clause which we had proposed. With this statement from Lummus we again recommended acceptance of their quotation and the A.E.C. approved our recommendation. Supplement Number 1 to Contract SO-5 was mailed July 1, 1955, to Lummus for their signature.

The low bidder on the Purex Concentrator Spares removed the contingency regarding a clause limiting the cost for rejected material to $20,000 with a refund to be made to us for any amount not used. They also put a limit of $10,000 on possible price increase for purchased material. We have recommended to the A.E.C. that the revised offer be accepted.

Essential Material

Liquid Carbon Dioxide - The contract will be with Cascade Fire Equipment Corporation for the period October 1, 1955 through September 30, 1958. The contract has been written and mailed to the vendor for signature.

Nitric Acid - The contract for the period May 1, 1955 through April 30, 1956 will probably be extended for an additional two months. No Acid has been ordered from DuPont for May and June. Thus, the reason for the probable extension. We have notified DuPont that the actual purchase may be as low as 5,600 tons instead of the contract quantity of 10,000 tons.

Tributyl Phosphate - The contract for the period July 1, 1955 through June 30, 1956 is to be with Westvaco Mineral Products Division, Food Machinery & Chemical Corporation. The contract has been written and sent to them for Signature.

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II Achievement - (Cont.)

Essential Material (Cont.)

Sulfamic Acid - The contract has been placed with Van Waters & Rogers, Inc. for the period October 1, 1955 through September 30, 1956 and is now with the Commission for signature.

Caustic Soda - Supplemental Contract No. 1 to Requirements Contract RO-10, with Pennsylvania Salt Manufacturing Company of Washington is now with the Commission for signature.

Liquid Aluminum Sulphate - Supplemental Contract No. 1 to Requirements Contract RO-11, with General Chemical Division, is with Finance for approval.

Ferrous Ammonium Sulphate - The bids that were received on Ferrous Ammonium Sulphate indicated that we should secure additional information. Therefore, we have extended the bid time to August 1, 1955 and will inform the vendor at that time whether we will inquire for other material.

III Organization and Personnel

Force Summary

	5-31-55			6-30-55			Change		
Component	Ex.	N.Ex.	T	Ex.	N.Ex.	T	Ex.	N.Ex.	T
General	3	3	6	3	3	6	-	-	-
Traffic	3	6	9	3	6	9	-	-	-
Purchasing Sub-Section	42	49	91	42	52	94	-	3	3
Stores Sub-Section	12	157	169	12	159	171	-	2	2
Total	60	215	275	60	220	280	-	5	5

Safety Experience

Employees of the Excess Warehousing and Shipping Unit have further increased their no accident safety record. As of June 30, 1955, 11,543 exposure hours have been worked without an injury.

To prevent the presence of ammonia fumes in the Receiving file room, it has been necessary to install a ventilating hood with a two speed exaust fan over the Ozalid machine used in this location. With the arrival of hot weather, fumes became offensive creating a safety hazard for the twelve employees working in this office. Previously no adverse effects had been experienced, and at the time the machine was installed no provision for special ventilation was made.

Three minor injuries were reported during the month.

Six safety and security meetings were held with a total ot 230 employees attending.

The Radiation Monitoring Unit has recommended, with the concurrence of the Radiological Standards Unit, that personnel meters be provided for the protection of two Receiving employees because of their handling of radioactive shipments at Central Stores. A small container will be provided to hold the meters for pick-up and delivery by Patrol.

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III Organization and Personnel (Cont.)

Plans are currently under way in formulating a civil defense program in Stores which will be integrated with the overall HAPO program. As a first step in our planning, we developed a questionnaire and distributed copies to employees to learn what questions they had regarding civil defense. On June 23 and 24, each Stores employee attended a meeting which included the presentation of a civil defense film entitled "Atomic Tests in Nevada". At each showing of the film the employees were informed of our general plans.

All employees in the Purchasing Sub-Section attended training programs on "Customer Relations" and "Telephone Courtesy".

Mr. Ward Nolan representing the General Electric ANP Department, Arco, Idaho visited Stores June 2nd. The purpose of this visit was to inspect our facilities and discuss methods and procedures with various Stores personnel.

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TRANSPORTATION SECTION
MONTHLY REPORT
JUNE 1955

Transportation Section personnel forces increased from 488 to 491 by three new hires, two transfers in, four reactivations - personal illness, one termination, three transfers out, and two deactivations - personal illness.

Fiscal year to date costs through May were under the budgetary provisions by $152,437 or 3.974% (salaries -$115,705, materials -$67,577, other costs +$30,845). June costs are expected to be higher which will slightly reduce the percentage of underrun. FY 1955 expenditures are $17,338 or 0.468% less than those for the same period in FY 1954. The following indicates comparative costs by major service functions:

Function	FY 1955 1st. 11 mos.	FY 1954 1st 11 mos.	% of change from FY 1954
Railroad	$ 672,653	$ 673,924	- 0.19 %
Plant Bus	1,234,977	1,249,619	- 1.17 %
Heavy Equipment Maintenance	533,195	533,917	- 0.14 %
Light Equipment Maintenance	608,637	698,980	-12.92 %
Road Maintenance	96,199	118,756	-18.99 %

The unit cost bogeys for FY 1955 will be attained except for the handling cost per railroad car where volume estimates failed to materialize. The FY 1954 performance will be equaled or surpassed in all other instances.

The accrual for public liability of $8,000 per month for the Transportation Section is being reduced to $2000 because of a substantial reserve which has accumulated in recent years due to a reduction in claims.

Revised agreements have been reached with the Financial Department relative to work performance and cost accounting for accident damage repairs on HO equipment. The principal change was to provide a better system of control on backcharges in reimbursable cases.

Furnished the Commission with reports on the emergency flood control work at Bonners Ferry, Idaho from May 21 through May 25, 1954. The Commission had been alerted that similar assistance might be required this year; however, the situation was relieved by cooler weather and now appears to be out of danger according to a report just received from the Corps of Engineers.

Gasoline, oil, antifreeze, and minor emergency repairs are now being supplied in the 1100 Area to Minor Construction Sub-Section equipment (DC-C units) on work order C-81397.

Discussed the rental of HO equipment to non-plant users with the Commission and the Financial Department. The standard applied equipment rates will be charged to the Commission on the same basis as departmental users. The Commission will bill the user at a predetermined rental rate.

Furnished information to the Financial Department for reconciling capital expenditures for equipment to appropriation requests and budgeted funds. The Commission has agreed that all transfers of equipment from other AEC contractors or governmental agencies may be applied against upgrade funds for FY 1955. It was previously interpreted that the use of upgrade funds applied only when a like or similar piece of equipment was to be excessed.

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Transportation Section

Initiated work orders against the Civil Defense code for removing weeds from around the three air raid sirens (fire hazard) and painting covers for the six emergency generators located at the schools in Richland. Inspection on the air raid sirens has been changed from a weekly to a twice a week schedule and a blower has been developed to remove sand and other foreign elements. This will facilitate starting and insure greater reliability.

The Commission has approved the designation of thirty White buses in the AEC Contingency Pool as stand-by units for civil defense evacuation. These buses will be maintained in instant readiness against civil defense funds. This work will commence shortly after the start of the new fiscal year so the equipment will be operational in advance of the next school term. In addition, four White buses were acquired for evacuation service at the 300 Area.

Revised the Civil Defense Plan for the Transportation Section and distributed information in line with the new thinking.

The annual physical inventory of automotive and heavy equipment is being conducted as scheduled. All units have not as yet been located and a number of assignment and cost code changes will be required. This is a property management function of the Transportation Section and is performed in cooperation with departments having assigned units.

A review of all pickup trucks is being made preparatory to the assignment of the 100 new Ford pickups now being received as replacements for a like number of 1947 International units.

A representative of the Commission's Washington office visited Hanford during the week of June 20. Following a tour of the Transportation Facility and conferences, certain information was developed at his request. He expressed general satisfaction with the management of the operation.

Essential corrective repairs to the hot air furnace in the 1171 Building have been estimated at $11,700. A meeting has been scheduled with the Commission, vendor, and contractor to determine responsibility for this work.

A contract has been let to perform roof repairs on the 1171 Building which were caused by wind damage during March. The contract was for $2,349.00.

New steel parts bins have been installed in the Area Shops. This is expected to lead to improved housekeeping and accountability.

Effective June 9 the maximum speed limit on Plant roads was raised from 50 to 60 miles per hour to coincide with the change in regulations by the State of Washington. Special speed controlling governors on light equipment will be removed or reset in deference to the higher legal speed limit.

As a result of efforts over a long period of time, it has been decided that the practice of using assigned vehicles for normal transportation between the 1170 Parking Lot and the Outer Areas will be discontinued on July 11. Regular bus service will be available and other arrangements have been made to serve special situations and emergencies. Studies have indicated that a substantial savings will be realized through lower operating and capital expenditures on light equipment.

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Transportation Section [redacted]

Commercial rail traffic during June decreased 9.9% over May due to lower receipts of coal and construction materials. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	1074	10	10	996
A.E.C. c/o Kaiser (cement)	5	0	0	5
Blaw Knox	1	0	0	1
Kaiser Engineers	15	0	0	28
U. S. Army	17	0	0	19
	1,112	10	10	1,049

Considerable extra switching was required at North Richland as certain materials were diverted to rail movements due to the truck strike.

Railroad process service during June decreased 22.1% over May due to production difficulties.

Coal receipts will be extremely low during the first two weeks of July as no coal will be shipped from the Montana and Wyoming mines due to the coal miners' annual holiday.

Railroad car movements including process service totaled 2,673 in June compared to 2,843 in May, 2,463 in April, 2,106 in March, 2,354 in February and 2,288 in January.

Routine maintenance of Plant railroad trackage during June required 5,981 man-hours. Distributed 210 tons of new railroad materials to job sites for the annual relay program.

The Plant Bus System transported 2.6% more passengers in June than in May. (The May report incorrectly indicated 142,615 passengers for a decrease of 12% over April whereas the actual passenger volume was 154,887 and only a 4.6% reduction.) The following statistics indicate the magnitude of service rendered:

Passenger Volume	158,915
Revenue - Bus Fares	$ 7,945.88
Earnings - Transit Advertising (May)	$ 94.75
Bus Trips	7,446
Bus Miles - Passenger Carrying	201,589
Passenger Miles	5,280,954

Express "to home" shuttle bus service on the day shift was established from the 200-West Area on June 6, and like service is being planned for the 100-F Area. This arrangement continues to receive excellent customer acceptance in the 300 and 200-East Areas where it was first inaugurated.

Scheduled bus service to North Richland was discontinued on June 17 with the expiration of commercial and residential leases. Personnel at the 101 Building have been provided quarters in Richland and the car pool was disbanded.

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Transportation Section [redacted]

The Richland Bus System transported 38.6% fewer passengers in June than in May due to the school vacation. This compares with the June reduction of 28% in 1954 and 24% in 1953. The following statistics indicate the volume of service rendered:

Total Passengers Including Transfers	6,741
Revenue - Bus Fares	$ 480.74
Earnings - Transit Advertising (May)	$ 4.31
Bus Trips	1,074
Bus Miles - Passenger Carrying	5,692
Passenger Miles	20,137

Off Plant chauffeured automobile trips (Company business and/or official visitors) totaled 178 which were rendered to the following locations:

Benton City, Washington	20
Enterprise, Washington	4
Grandview, Washington	2
Hinkle, Oregon	6
Kennewick, Washington	37
Kiona, Washington	1
Pasco, Washington	46
Pendleton, Oregon	28
Prosser, Washington	9
Spokane, Washington	2
Sunnyside, Washington	5
Walla Walla, Washington	12
Yakima, Washington	6

The following tabulation indicates in gallons the volume of fuel distribution during June:

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at Start of Month	74,487	19,760	10,150	2,566	90
Received During Month	116,042	20,150	33,000	2,400	424
Disbursed During Month	113,275	22,880	35,750	881	324
Stock at End of Month	77,254	17,030	7,400	4,085	190

The following tabulation indicates the volume of equipment maintenance activities during June by types of service and number of jobs:

Motor Overhauls	46
Class A Inspections and Repairs	77
Class B Inspections and Lubrications	1008
Weekly Inspections - Fuel Trucks and Off Plant Vehicles	17
Semi-monthly Inspections - Buses	168
Monthly Inspections - Railroad Rolling Stock	3
Visualiner Inspections	61
Routine Maintenance Repairs and Service Calls	1606
Accident Repairs and Paint Jobs	46
Tire Repairs	625
Wash Jobs	438
	4,095

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Transportation Section

Thirty-five units of contaminated HO equipment were cleaned at the 269-W Building during the reporting period.

The following tabulation indicates the number of HO mileage vehicles in service during May and the utilization of each type:

Code	Type	No. of Units	Total Mileage
1A	Sedan	394	552,433
1B	Buses	92	214,803
1C	Pickup Trucks	448	232,181
1D	Panel,Carryall,Sta.Wagon	161	123,765
1G	Jeeps	3	791
1H	Power Wagons	50	21,145
68 Series	Trucks	221	90,512
		1,369	1,235,630

Following a study of tire recapping service, arrangements have been completed whereby contracts will be let for a period of six months and vendors will be required to meet government specifications as to materials and procedures. This should produce beneficial results.

Seal coated 9.3 miles of 20' roadway (By-Pass Highway) for the Community of Richland requiring 1,650 tons of mineral aggregate and 30,000 gallons of MC 5 asphalt.

Began the covering of the Redox railroad cut embankment with a 6" earth blanket to control contamination. Expended 225 man-hours in other contamination control activities at the 100-F and 200-West Areas.

Expended 428 man-hours in assisting in shutdown repairs in the 100-F and 100-D Areas.

Maintenance of Plant roads and the production of road aggregate materials required 790 man-hours.

The following tabulation indicates in tons the volume of asphaltic material handled during June for road maintenance:

	MC 3	MC 5
Stock at Start of Month	14.66	23.89
Received During Month	41.00	125.31
Used During Month	6.00	125.00
Stock at End of Month	49.66	24.20

The following tabulation indicates the volume of mineral aggregate and pre-mix material handled in June for road maintenance:

	3/4" to 0 Pre-mix Tons	¼" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Crushed Rock Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at Start of Month	1,076	696	5,437	514	4,046
Made During Month	0	0	1,005	0	0
Used During Month	611	53	1,307	8	270
Stock at End of Month	465	643	5,135	506	3,776

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ENGINEERING DEPARTMENT

JUNE 1955

ADVANCE ENGINEERING SECTION

The higher reactor productivity in 1954 compared to that experienced in 1953 is equivalent to that obtainable from spending $120,000,000 for new reactor construction.

PILE TECHNOLOGY SECTION

Initial results of the fringe poison test for reducing shield temperatures, PT 105-604-A, appear promising. Maximum far-side biological shield temperatures in the H Pile have been reduced from 116 C to approximately 81 C with thorium in alternate central far side fringe columns, and with sufficient enrichment added to the fifth lattice unit ring to maintain the previous flattening efficiency and pile power level.

X-ray measurements of graphite samples exposed up to 800 MD/CT at temperatures of 300 to 500 C exhibited about a one percent increase in the C_o parameter. Physical dimension measurements on these same samples showed a contraction of as much as 0.15 percent. These are the first data from high temperature irradiations that indicate damage of the graphite crystallite accompanying a physical contraction of the graphite samples.

Chromel-alumel thermocouples were exposed for periods up to 100 hours at 1000 C in atmospheres of helium, air, carbon dioxide, and carbon dioxide plus graphite to determine whether changes will occur to their thermoelectric and mechanical properties under these conditions. Recalibration of the thermocouples at 1000 C following their exposure indicates that thermocouples exposed in helium or air are relatively stable mechanically and thermoelectrically. Thermocouples exposed for 20 or more hours in carbon dioxide or carbon dioxide plus graphite were too brittle to recalibrate.

Progress to date on procurement of ribbed zirconium process tubes for high pressure, high temperature recirculation tests in the KER Facility, is not encouraging. To date no billets have been successfully extruded. Several alternate avenues of approach are being investigated. The most promising alternative is the use of ribless zirconium tubes, which are considerably easier to fabricate and would be preferable for rod-type fuel elements or for slugs having individual supporting lugs. A second alternative is the use of stainless steel tubes.

Two leaking process tubes were removed from the central zone of D Pile in a one-week period. The corrosion attack on these tubes was of a type best described as a combination F-type, ledge type corrosion. The areas of heavy attack where the leaks occurred were between the ribs. In these heavily corroded areas the minimum tube wall thickness measured was 10 to 14 mils, while the average was about 25 mils. At other spots in the tube where severe local corrosion had not occurred, the tube wall was 40 to 50 mils thick. The ribs in this section of the tube had been reduced 40 to 50 mils in height, which probably resulted in a higher local water temperature in the area of severe corrosion. Other tubes are being removed from D Pile to determine the extent of this condition.

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The production test exposure of zirconium-canned fuel elements at C Reactor has been terminated. Cast core bonded zirconium-canned fuel elements failed after only four hours operation and an unbonded zirconium-canned slug ruptured after 14 operating days in the pile, reaching an exposure concentration of 100 MWD/T.

Experiments recently performed at Rocky Flats have shown the sub-criticality of various arrays of Hanford sample cans containing from 300 to 350 grams of plutonium per can. A nuclear safety review of the handling and storage procedures for sample cans containing up to 400 grams of plutonium has been made in the light of this new evidence. As a result, it has been determined that a close-packed, one-layer array of such cans is safe against chain reaction under all circumstances with the possible exception of introducing an optimum amount of hydrogenous material into the interior of the array. These results are useful in establishing handling procedures and have permitted the doubling of the capacity of the AEC off-site shipment facility.

The MCW development program has produced dingots with high densities and low chemical impurities (with the exception of hydrogen) as compared to ingot uranium. High (good rod to slug) yields of 94 to 97 percent have been obtained from dingot uranium processed at the FMPC.

A production test is being initiated to determine the effect of increased pile power on cored lead dip canned fuel elements. The elements to be tested will consist of uranium enriched to 1.75 percent U-235 with both 3/8 and 5/8-inch diameter cores and with both welded uranium and pressed-in aluminum end plugs.

The survey of aluminum alloys suitable for operation in di-ionized water at temperatures up to 350 C has been completed. Several aluminum alloys containing nickel, copper, or silicon appear to be satisfactory. Research is now being directed toward methods of preventing formation of films which would inhibit heat transfer.

Examination of low exposure production slug failures was continued on two slugs from 100-H. One was typical of the current failures, and the other was an unruptured slug thought to have been affected by the initial stages of the process causing failure. Metallographic study of the ruptured piece revealed no abnormalities in metal quality or exposure effects and that the condition of the AlSi braze and compound layers conformed to the normal fabrication quality. The metallography and chemical analysis of the can conformed to the specifications for 2S aluminum. However, study of the corrosion effects on the can wall indicated that the aluminum had severe intergranular corrosion attack in the portions of the can that had apparently not been adequately cooled during pile exposure. This corrosive attack was general throughout the "hottest" area of the slug surface and was most advanced in the area of actual rupture. Other isolated spots were found where the intergranular attack had penetrated half the can wall thickness. The intergranular corrosion was not found on the portions of the slug where cooling had apparently been normal. The unruptured slug also

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had surface scale formation indicative of uneven cooling. Metallographic examination showed the intergranular corrosive attack in the hotter portion of the jacket. Intergranular corrosion has not been observed on other, previously examined, cocked, bored, or ruptured slug jackets.

SEPARATIONS TECHNOLOGY SECTION

By a dissolving modification involving the use of lower initial acid concentrations, the amount of iodine evolved from the Redox dissolvers has been reduced slightly. Procedure modifications in dissolving and head-end have also indicated a possible Redox capacity increase of about 1 ton per day at these points.

Solids in the metal recovery process streams produced a considerable quantity of high activity product that required rework.

Purex Hot Semi-works studies were continued to be directed toward achieving suitable decontamination. Little success was achieved and decontamination factors were low by a factor of 10. The IA scrub sections is currently being modified to produce more efficient scrubbing of fission products. Zirconium appears to be the worst offender.

Three runs were made in the 16-inch continuous calciner at low feed point temperatures (230°C) to determine the effect on UO_3 quality. Steam injection to form the monohydrate was also tested on one run. The reduction rate to UO_2 as measured by a laboratory test was equivalent to that produced by the batch pot. The reactivity to hydrofluorination was 0.85. Further studies to improve powder quality will continue.

DESIGN SECTION

Design Section effort by major components for the month was approximately as follows:

	Percent of Total Effort
Design Development Programs	41
Reactor Plant Modification for Increased Production	12
4-X Program	14
Purex Plant Modifications	5
Other Design Projects	16
Customer Work & Miscellaneous	12

Total design for Project CG-558, Reactor Plant Modification for Increased Production, advanced to 85% complete. All phases of the project design are well advanced. The principal remaining design work involves the 105 Building and 151 Sub-Station.

Detailed design for all phases of the 4X Program is essentially complete with the exception of the Metal Conversion Plant Expansion. Design for the 224-UA (new annex) was altered during June to provide for lump sum construction of Phase III which includes placement of equipment, piping,

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wiring and the exhaust ventilation system. Detailed design for the continuous calciner was completed during the month.

Design Progress status for the 4X Program as of the end of June is as follows:

	Design Scope	Detailed Design
CG-599 - 4X Program - 100 Area	100	100
CG-603 - 4X Program - Bismuth Phosphate Plant	100	97
CG-613 - 4X Program - Metal Conversion Plant	100	73
CG-614 - 4X Program - 300 Area	100	99

Major Reactor design development items in progress during June included power recovery from high-temperature effluent water, improved process tube connectors, resistance thermal detectors for temperature monitoring, continuous charge-discharge demonstration unit for the 100-C reactor, evaluation of continuous charge-discharge facilities for the 100-K reactors and engineering feasibility studies for three high-temperature high-pressure recirculation test loops for installation at 100-DR.

In the field of Separations design development preliminary design scope was completed for liquid circulators for underground waste storage tanks and for iodine monitoring facilities at Redox. Further investigations are being made of alternates for improved Redox ventilation as part of the contamination control study. Work continued on preliminary studies of the need and methods of providing facilities for additional plutonium separations capacity.

PROJECT SECTION

At the end of the month major construction completion status was as follows:

Project No.	Title	Completion Scheduled	Completion Actual
CA-512	100-K Area Facilities (excluding 1706-KER construction which has not been scheduled)	100%	100%*
CA-513-A	Purex Facilities, Part A	100%	100%**
CA-514	300 Area Expansion	97%	100%***
CA-539	Additional Waste Storage Facilities, Redox	78%	78%
CA-546	Fuel Element Pilot Plant	55%	55%
CG-558	Reactor Plant Modfications	14%	11%
CG-603	Hanford 4X, Bismuth Phosphate Plants	42%	70%

* Complete except for clean-up and start-up items.
** Complete except for start-up and design changes.
*** Complete with exceptions.

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The strike on May 24, 1955, by 78 operating engineers was resolved by the middle of June. Some operators resumed work on June 8, and the remainder returned by June 13. Conditions of the settlement were essentially the same as prevailed before the strike. If available on the job, operating engineers are to start the compressors; otherwise, another craft on the job will operate them.

The total inspection workload increased to about 550 orders, of which 458 had been assigned to inspectors. Criteria and procedures have been established for inspection by one of the following: (1) General Electric off-site, (2) government agencies off-site, or (3) General Electric at HAPO An on-site vendor inspection staff is being formed.

The total manpower ceiling for labor service contractor personnel (Minor Construction) has been raised from 1,000 to 1,150, and a request has been made for a new ceiling of 1,300 to meet requirements of Purex and Reactor Plant Modification projects.

Work at Purex Facilities has now been divided into three parts: Design changes and operability tests, the railroad tunnel, and the 2.75 factor capacity increase. Initial operability testing was continued toward scheduled completion during July 1955. Of a total of 84 Acceptance Test Procedures, 66 have been completed. The remainder apply to 241-A Waste Storage, canyon heating and ventilating systems, control rooms, and building services. Work on design changes proceeded under interim authorizations from AEC. Bids for the railroad tunnel were opened on June 28, and the apparent low bid was $248,295 compared with the fair cost estimate of $248,968. Minor Construction has started the work to be done before the contractor moves in.

ORGANIZATION & PERSONNEL

Total on Roll, June 1, 1955	1,413
Net Change	+10
Total on Roll, June 30, 1955	1,423

A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SECTION

JUNE 1955

A series of five sessions on work simplifcation, led by W. E. Engesser, an industrial engineering professor from Oregon State College, who is one of a number of college professors on summer assignments at HAPO, was started for exempt personnel of the Technical Information Unit during the month. Conferences with individual supervisors on specific problems will also be offered.

The Supervisor of Reference and Circulation attended the annual conference of the Special Libraries Association in Detroit during June. Many topics of direct interest to the Plant Library were discussed. Also attended in connection with the Conference were meetings of AEC librarians and of General Electric Company librarians. At the latter meeting, the librarian from Electronics Park was appointed to compile a questionnaire on library services at the different Company libraries. Results of this survey will be made available.

The report to the AEC on reprint and pamphlet purchases was prepared and forwarded. Forty-four orders were involved during FY 1955, having a total cost of $813.66. Approval has been received from the AEC to raise the total allowable expenditures for reprints and pamphlet purchases to $1,000 for FY 1956.

The AEC has approved a request to raise the letter order maximum from $10.00 to $25.00. As indicated last month, this approval will reduce by 50% the number of purchase requisitions required by the library, with resultant savings and more rapid service on book orders.

A test case was made during the month of a new procedure incorporated in the revision of OPG 21.4 at the request of Internal Audit. The procedure permits the billing of an employee for lost books. In this particular case, all regular overdue notices had been disregarded, and some of the books were badly needed to fill pending requests. A letter of "intent to bill" was sent and eighteen books were promptly returned.

Two papers entitled, "Separation of Measurement and Sampling Variation From Product Variation for Establishing Statistical Tolerance Limits on the Product," and "Comparison of Various Types of Statistical Acceptance Sampling Procedures," were prepared and presented by members of the Statistics Unit at the Statistical Section of the Annual Meeting of Accountability Representatives at Washington, D. C., June 20-21. These meetings were attended by approximately seventy-five statisticians and accountability representatives from most of the AEC sites throughout the country.

During the month the following Major contract activities were handled:

1. Special Agreement No. G-60 between General Electric and Tektronix, Inc. providing for instruction of General Electric employees in the care and-

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maintenance of Tektronix equipment has expired before execution by the Contractor. We have been advised that a time mutually acceptable to both General Electric and the Contractor for the instruction of General Electric personnel cannot be arranged before late Fall of 1955. Special Agreement G-60 will, therefore, be withdrawn and a new agreement written at a later date.

2. Modification No. 2 to Consultant Agreement No. 106 between General Electric and Dr. Edward James for the addition of a Patent Article as requested by AEC was executed by Dr. James on June 14.

3. Special Agreement No. G-65 between General Electric and Phillips Petroleum Company as Prime Contractor for the Idaho Operations Office providing MTR experimental work was executed by the Contractor June 13.

4. Modification No. 1 to Special Agreement G-61 between General Electric and Maxine Dockum adding a Patent Article as requested by AEC was executed by Mrs. Dockum June 10.

5. Modification No. 1 to Special Agreement G-56 between General Electric and Wheeler & Russell providing for an extension of time of the agreement and adding a Patent Article was executed by the Contractor June 7.

6. Consultant Agreement No. 125 between General Electric and Booz, Allen & Hamilton providing for Management Consultant Services was executed by the Consultant June 16.

7. Consultant Agreement No. 126 between General Electric and Professor J. P. Frankel providing Consultant Services in the field of Fuel Elements was executed by the Consultant June 13.

8. Special Agreement No. G-62 between General Electric and Industrial X-Ray Engineers providing for X-raying castings and interpretation of the radiographs was terminated by the Contractor because of uncertainties in the work. A new agreement is being prepared providing for interpretation of the radiographs only.

9. Special Agreement No. G-69 between General Electric and McCray Marine Construction Company providing for inspection services of the intake screen at 181-KE was executed by the Contractor June 24.

R. J. Schier

R. J. SCHIER, MANAGER
ENGINEERING ADMINISTRATION SECTION

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Pile Technology Section

W. J. Ozeroff discussed critical mass problems in metallurgical fabrication at UCRL, Livermore, California, and Los Alamos Scientific Lab., Los Alamos, N. M. and attended a consultation on ANP Project at ANPD, Cincinnati, June 16-23.

W. E. Ray and P. D. Wright discussed vacuum melting techniques at BMI, KAPL, ANL and Iowa State College, June 6-10.

J. W. Riches consulted on uranium fabrication at National Lead, Fernald, Ohio, June 15-17.

W. R. Smith made an inspection of connector fabrication at the Resistoflex Corp. New York City, June 30.

G. W. Stuart attended a meeting of the American Physical Society, Toronto, Canada, June 22-24, and discussed reactor theory at KAPL and BNL, June 27-30.

W. B. Tolley visited Mallinckrodt Chemical, St. Louis, and KAPL, June 7-10, to discuss uranium reduction technology.

E. C. Wood discussed non-destructive testing methods and specific devices for testing uranium at Battelle Memorial Institute, Oak Ridge National Lab. and Savannah River Plant, June 20-24.

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Pile Technology Section

ORGANIZATION & PERSONNEL

Personnel totals are as follow:

	May 31	June 30
Administrative	2	2
Pile Engineering	90	92
Pile Materials	60	62
Fuel Technology	109	116
Physics Research	38	39
Metallurgy Research	72	74
Contact Engineering	4	4
Totals	375	389

Pile Engineering: J. L. Bond and T. G. Harbour, Engineering Assistants, were new hires on June 1 and 22, respectively; L. H. McEwen, Unit Head, transferred from Contact Engineering on June 1; M. W. Carbon, Unit Head, transferred to Contact Engineering on June 1.

Pile Materials: R. S. Hagan, Engineering Assistant, was hired on June 6; L. A. Jobe, Engineer I (summer employee), was hired on June 20; B. L. Martin, Engineering Assistant (summer employee), was hired on June 15; W. C. Riley, Engineer I, transferred to Fuel Technology on June 6.

Fuel Technology: R. F. Durnford, Engineer I (summer employee), was hired June 20; J. T. Mommsen, Engineer II, was hired June 9; J. E. Mullendore, Tech Grad (summer employee) was hired June 20; F. X. Armatis, Engineering Assistant, transferred from Metal Preparation Section on June 13; F. C. Brecto, Engineering Assistant, transferred from Metal Preparation Section on June 6; R. J. Marquis, Engineering Assistant, transferred from Metal Preparation Section on June 27; C. M. Pederson, Engineering Assistant, transferred from Metal Preparation Section on June 6; W. C. Riley, Engineer I, transferred from Pile Materials on June 6; Vera M. Scott, Secretary C, terminated on June 9.

Metallurgy Research: J. Washburn, Senior Scientist (summer employee), was hired June 30; P. W. Dickson, Tech Grad, was premanently assigned on June 6, L. E. Craddock, Engineering Assistant, was re-activated on June 16; P. W. Dickson, Tech Grad, went on military leave June 24.

Physics Research: Richard G. Moore, Jr., Engineer I (summer employee), was hired on June 6.

Contact Engineering: M. W. Carbon, Unit Head, transferred from Pile Engineering on June 1; L. H. McEwen, Unit Head, transferred to Pile Engineering on June 1.

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PILE ENGINEERING SUB-SECTION

PROCESS TECHNOLOGY

Power Level Limitations

The maximum operating power level during June, 1955 was limited by 105 C outlet water temperature at B, DR, and F Piles, 100 C outlet at C and H Piles and trip before instability limits at D Pile. At KE and KW Piles the power is limited to 500 KW/tube to prevent extensive damage in case of a sudden and complete loss of water to the tube.

Process Specification Changes

Specification 56.00, covering the setting of Beckman trips, was changed to give more flexible trip settings during periods of slowly rising power provided certain temperature control requirements and limits are followed. The start-up Beckman procedures at the K Reactors were changed in order to provide for more practical and safe operation.

Pile Operation

Pile operation was essentially normal during the month. The number of slug ruptures continued high but showed an improvement over last month. The rupture of slugs at low exposure continues.

Pile water leaks, particularly at D Pile, continue to be a potentially serious problem. The problem is made worse by continued operation of the piles after a major leak has developed. In addition the operation of the pile drying system could be improved. It would appear that some simple improvement could be made in some dryer systems which would aid in drying effectiveness.

There is reason to believe that most of the water leaks at F Pile are small Van Stone leaks that occur when the pile is shut down. It is possible that this phenomenon is more prevalent at F Pile because of the relatively large number of gun-barrels there that are reluctant to move with tube expansion and contraction.

Ruptured Slugs

Nineteen slug failures occurred during the month. These consisted of fourteen failures of regular production metal, one failure of a zirconium clad piece being irradiated under a production test, one failure of an Al-U-235 alloy "C" metal slug, and two failures of Al-U-235 alloy "J" metal slugs. The rupture experience for the month of June is summarized in Tables I and II. In addition, four suspected ruptures were discharged from D Pile on 6-26-55, but have not yet been confirmed.

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TABLE I

URANIUM SLUG RUPTURE EXPERIENCE -- JUNE 1955

Type of Metal	Tube No.	Failure Date	Exposure (MWD/T)	Failure Type
8" Normal U. - "M" Lot	2880-F	6-1-55	156	Side
8" U. - Zirconium Clad	2582-C	6-2-55	99	Jacket Split
8" Normal U.- "K" Lot	3683-D	6-6-55	726	Side
8" Normal U. - Recanned "Z" Lot	2590-C	6-7-55	264	Side
8" Normal U. - "B" Lot	2283-D	6-9-55	692	Non-Classified
8" Normal U. - "K" Lot	1678-F	6-10-55	198	Side
8" Normal U. - Recanned "Z" Lot	1469-C	6-12-55	250	Side
8" Normal U. - "K" Lot	0769-H	6-13-55	225	Side
8" Normal U. - "K" Lot	3869-C	6-13-55	247	Side
8" Normal U. - "N" Lot	1572-D	6-14-55	704	Split
8" Normal U. - Recanned "Z" Lot	1564-C	6-19-55	232	Side
8" Normal U. - "L" Lot	3573-D	6-19-55	681	Side
8" Normal U. - "L" Lot	3681-D	6-19-55	666	Side
8" Normal U. - "L" Lot	3477-D	6-19-55	693	Side
8" Normal U.	2583-C	6-21-55	868	Split
8" Normal U. - "L" Lot	3586-D	6-26-55	643	Unexamined

TABLE II

ALUMINUM - U-235 ALLOY SLUG RUPTURE EXPERIENCE

Type of Metal	Tube No.	Failure Date	Exposure (MWD/tube)	Failure Type
"C" Metal	1293-C	6-3-55	113.2	Jacket split
"J" Metal	2573-H	6-4-55	167.5	" "*
"J" Metal	3664-C	6-13-55	93.2	" "

*Five ruptured pieces were discharged from this tube

Seven of the regular metal failures this month occurred at exposures in the region of 250 MWD/T or less, as compared with 14 failures in this range the previous month. The majority of these failures exhibited the elliptical patches of gray, porous aluminum and the film markings noted on most of the recent "low exposure" ruptures. Examination of several process tubes from which such ruptures had been discharged revealed film markings on the tube walls similar in appearance to the markings on the ruptured pieces. The position of the tube markings has not been shown conclusively to coincide with the position of the ruptured slugs.

Further metallurgical examination of a "low exposure" side failure and of an unruptured piece with similar markings showed that intergranular corrosion had occurred in the area of the elliptical "patch", indicating that the jacket had attained temperatures at least in the region of 200 C. This fact, combined with the tube wall markings, would tentatively indicate that the pieces were in "near-contact" with the

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tube wall. Preliminary measurements by the Fuels Examination Unit have shown no evidence that these failures result from slug warping. Slugs from tubes in which "low exposure" failures occurred were measured and none exhibited excessive warp, the maximum observed being 33 mils. No unruptured pieces with "hot spot" markings have been available for measurement, however. It is planned to measure such pieces when they can be obtained.

Six of the failures at D Pile this month occurred in metal charged on 12-12-54, making a total of nine failures out of the 257 tubes charged at D on this date. The metal that was charged in D Pile on 12-12-54 was from a "B" lot, 2 "L" lots, and 2 "N" lots. To date ruptures have occurred in all lots except for one of the "N" lots. Although the majority of these failures have occurred in a relatively small area in the upper-far quadrant of the pile, there is, as yet, no evidence that an abnormal operating condition in this area is responsible for the failures. The area in question contains substantial quantities of metal charged on other dates which is currently at higher exposures than that charged on December 12. Studies of this problem are continuing.

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Production Tests

Test No.	Type Metal	Number of Tubes	Pile	Goal Exposure	Present Exposure	Remarks
105-570-A	Cored-Lead Dip	4	2-C	2 ruptures	Discharged	Rupt. at 1158 & 1173 MWD/T
			2-F	"	1225-1275	
	Control	4	2-C	"	1 discharged at 1046	1 ruptured at 1128 MWD/T
			2-F	"	1125-1175	
105-576-A	Powder Metallurgy	4	C	1 rupture	Discharged	Ruptured at 813 MWD/T
		8	F	750-840	"	Control tubes for stability measurements
		37	F	750-840	"	Supplementary tubes
	Control	1	C	1 rupture	"	Ruptured at 922 MWD/T
105-583-A	IQS-7	4	H	900	810-830 MWD/T	Ingots differ slightly from regular production ingots.
105-581-A	IQS-8	6	H	900	750-800 MWD/T	
105-592-A	IQS-9	6	H	3-900,3-600	800-825 MWD/T	3 discharged at 612-628 MWD/T
105-586-A	U-Si ingots	1	B	900		
	U-Si dingots	4		2 ruptures		not yet charged
	U-Si cored	3		900		not yet charged
	Control	4		2 ruptures		not yet charged
105-587-A	Internally and Externally Cooled	7	C	600	1 tube discharged at 135 MWD/T. Others not yet loaded.	Water temperature in core of discharged slugs was higher than predicted, indicating need for larger core.
105-588-A	Development Test of Extruded and Drilled Cored Slugs	3 tubes per mo.	1-C	900	discharged	ruptured at 797 MWD/T
			3-C	1100	200-220	
			3-D	900	420-430	Charged 3-7-55. 1 rupt. at 174 MWD/T.
			5-D	900	300-325	Charged 3-30-55
105-590-A	Extruded Cored	4	C	ruptures	not yet charged	Compares performance of extruded and drilled cored slugs

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Test No.	Type Metal	Number of Tubes	Pile	Goal Exposure	Present Exposure	Remarks
105-591-A	Cored-Al end plugs	Approx. 300 137 22 48	KE D C F			Authorizes irradiation of production quantities of cored slugs
105-593-A	Cored-Al end plugs	4	C	1-200 1-600 2-900	35 35 35	Charged 6-20 Charged 6-20 Charged 6-20
105-596-A	Dingot Slugs	9	F	2-300 2-600 5-900	170-260	Slugs charged alternately with control slugs from rod-transformed and slug-transformed metal
105-597-A	Mg-U Matrix	1	B or D	3000	not yet loaded	2 Matrix slugs + 31 reg slugs
	4" Slugs	1	B or D	6000	not yet loaded	10 Enriched Matrix and 12 normal Matrix slugs
105-601-A53-MT	Solid	12		2-300 5-600 5-900	Circulating for approval	Delay of 30,43,50, and 80 seconds between salt bath and water quench.
105-602-A	Cored Solid	5 5	C C		Discharged	Tubes discharged because desired power was not being attained
105-603-A-47-MT	Cored - Crimped uranium end plugs	4		1-300 1-600 2-900	Circulating for approval	

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HEAT TRANSFER

Program to Raise Pile Outlet Temperatures

Using the full scale mockup with new process and heater tubes, steady state boiling curves were determined for B, D, F Pile geometry at tube powers up to 900 kw using steam condensate as coolant. These tests, under film free conditions, were made to determine whether scaling conditions in previous tests were wholly responsible for distortion of boiling curves at high tube powers. Incomplete analysis of test results indicates the distortion to persist when scale is absent, presumably due to local boiling increasing flow resistance in the rear of the active zone at temperatures near and above 138 C.

The boiling curve distortion resulting from this phenomenon acts to lower the sensitivity of existing flow monitoring equipment to flow reduction brought on by partial plugging upstream of the venturi throat. Consequently, experiments are scheduled for early execution to determine response of the system to transients of flow and power in order to appraise the importance of decreased sensitivity to upstream plugging. Installation of the special apparatus necessary for these tests is now substantially complete.

Cooling-by-Boiling Equipment Development

Modification to the full scale mock-up to permit operation in the 2,000 psi region proceeded satisfactorily and is now 75 per cent complete. Critical elements have been delayed by fabrication difficulties and strikes, consequently the equipment will not be ready for performance testing until September. The schedule of necessary performance tests has been completed, and design and procurement of heater tubes, process tubes, and special fittings continued.

Hydraulics Studies

As a portion of the program to increase pile outlet temperatures, tests were initiated to determine the hydraulic characteristics of rear crossheader orifices at elevated water temperatures. In addition, tests were initiated to determine the relative flow in annulus and hole for I & E slugs with varying hole sizes. The hydraulic characteristics of alternate adapter fittings for use with replacement K Pile front pigtails were determined as a service to the Design Section.

Pile Safety Studies

Work continued on the preparation of a formal report dealing with the probable consequences of loss of water to a Hanford pile, taking into account the best available data on uranium-aluminum diffusion rates.

A study was made of the piping by which the rear risers at the K Piles are drained as an aid to charge-discharge operations. Procedures were formulated for operation of this equipment without causing any process tubes to be drained free of water. After review by Manufacturing Department and other personnel it is expected that these or similar procedures will be adopted and the equipment put to profitable use.

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A similar study was made of the use of the high and low pressure cross-tie lines at the K Piles. From this study desirable operating procedures were developed. Subsequent review with Manufacturing Department and Design Section personnel led to general agreement on methods to be used for safe operation of this system.

Graphite Temperature Calculations

Assistance was rendered Advance Engineering personnel in the use of the electric analog for determining graphite temperatures in a unique lattice design.

PILE PHYSICS

Graphite Temperature Coefficient Measurements - PT 105-600-A

The second measurement of the graphite temperature coefficient of reactivity of the KE Pile as a function of exposure was carried out June 23 and 24 with a weighted pile exposure of approximately 110 MWD/T. While the helium content of the pile atmosphere increased from 34 to 54 per cent in two steps, the pile lost approximately 60 inhours and the average graphite thermocouple temperatures in stringers #1 and #6 dropped approximately 70 C. At first glance, these results compare closely with the results of the May test in which approximately 45 inhours were lost during a drop of approximately 53 C in average readings of the same thermocouples; results to date, therefore, do not indicate a marked increase in the graphite coefficient with exposure in the range from 0 to 100 MWD/T.

Long Term Gains Studies - PT 105-553-A

The last of 6 columns of slugs irradiated under this PT in the F Pile were discharged from the F Pile during the month; the three of these columns slated for longest irradiation reached their goal exposure of 1400 MWD/T without experiencing any ruptures. A supply of slugs whose base reactivities were determined in the test pile are now available over the range from 0 to 2000 MWD/T for final test pile reactivity determinations. Arrangements are proceeding with the Radiometallurgy Unit for slug storage and handling facilities and with the Physics Development Unit for adapting cask facilities to permit charge and discharge of the hot slugs in the test pile. These arrangements are expected to be completed in about three months.

Analysis of K Pile Startup Data

A formal report on the temperature coefficient tests performed during the KW startup is now awaiting reproduction by Technical Publications as HW-37158-P2. Final values obtained from the tests, corrected for flux and temperature distribution weightings but not for leakage, are the following for un-irradiated natural uranium loadings in the 7-1/2" lattice over a maximum temperature range of approximately 150 C dry and approximately 80 C wet:

	Dry lattice	Wet Lattice
Graphite Coefficient	$-1.25 \pm .05$ ih/°C $+ .0006 \pm .0003$ ih/°C^2	$+ 1.10 \pm .14$ ih/°C
Metal Coefficient	$- 1.05 \pm 0.04$ ih/°C	$- 1.28 \pm .11$ ih/°C

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Part 1 of the K Pile Startup series of documents is currently in preparation. Basic lattice buckling determinations have been completed and are now being examined for range of error.

Pile Safety Studies

Cross section data weighted for Maxwellian distribution indicate that a thin cadmium wrapper would have the appropriate properties to compensate in part the positive coefficient effect of the plutonium resonance (HW-36624-G.W. Stuart). The neutron economy of such a scheme will be calculated in order to determine its feasibility for consideration as a "tamper proof safety fuse."

The proposed production test for attempting to simulate the KW excursion of 4-6-55 by control rod manipulation (PT 105-599-A) has been cancelled. Reactor section is proceeding to devise and install instrumentation to warn the operator any time rod is being withdrawn, thereby providing protection from potential excursions due to reversed rod direction.

A production test to determine the effect of moderator temperature on safety system strength (PT 105-606-A) is currently being circulated for signature. Calling for rod-drop transient measurements at the beginning and at the end of the same shutdown, the test is expected to indicate at little cost in production time whether or not gross changes in the safety system control capacity are associated with normal changes in pile graphite temperature.

Fringe Poisoning for Reduction of Shield Temperatures - PT 105-604-A

Initial results from this test loading, charged into the far side of the H Pile early in the month, appear promising. With thorium loaded into alternate tubes in column 96 and with a slight increase in the enrichment density in column 92, natural uranium columns in column 96 run at approximately 70 per cent of their previous values, whereas the specific tube powers in column 92 have remained about the same. Maximum biological shield temperatures on the far side of the H Pile have been reduced from 115 C down to 80 C as a result of this test.

Proposed Horizontal Rod Calibration Test

A preliminary outline has been developed for a rather comprehensive program of calibrating the horizontal control system of a "typical" 9-rod pile. Discussions have been held with Operational Physics and Physics Development personnel regarding the objectives, methods, instrumentation, and timing. A 36 to 48 hour period following the minimum outage time would permit a thorough calibration of at least two rod withdrawal orders both with and without accompanying temporary poison columns. It is felt that the gains to be realized from improved operational physics data will be well justified by better operating efficiency and pile safety as a result of a sound calibration program.

The three physics groups will work together to devise a well-considered test program to be performed in a "typical" pile loading and with adequate instrumentation; it is expected that a production test sponsored by the Pile Physics Unit will be circulated for approval early in the Fall.

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PHYSICS DEVELOPMENT

Prototype Physical Constants Test Reactor

The installation of the major mechanical systems for the prototype Physical Constants Test Reactor was largely completed at the month's end; included are the vertical safety systems, moving face mechanisms and flux leveling mechanisms which require but minor additional work to be satisfactorily functioning systems. The installation of the mechanical portions of the horizontal control systems will be completed early next month as will several other minor items, e.g., source moving mechanisms, which are not essential to the engineering component test program. The testing of mechanical components is expected to be completed during July.

The instrument systems have been assembled, checked in the laboratory, and installed in the control room in 305-B. The galvanometer system performed adequately during tests in the Test Pile; a $B^{10}F_3$ ionization chamber of interim design will satisfactorily saturate at 20 watts and will be in error (departure from linearity) about 5 per cent at 100 watts. Period measurements in the Test Pile indicate that the PCTR instrumentation should permit a reactivity measurement to ± 0.01 inhour at the one watt level (10^7 neuts per cm^{-2} sec^{-1} in the reactor core). The neutron sensitive ionization chambers are currently being fabricated.

The completion of the electrical systems is proceeding rather slowly -- largely because the mechanical components must be in place before final circuit wiring can be completed. It appears doubtful that electrical circuit work, including safety circuit interlocks, can be completed prior to July 15. Verbal assurance has been given by Metals and Controls that the lead-UO_2 matrix fuel required for criticality (4.1 kilograms of U-235) will be fabricated prior to July 1 and shipped immediately. It is currently believed that the reactor can be made ready for the initial loading to critical by the end of July.

Slug Rupture Detection

The scheduled installation of the gamma spectrometer slug rupture detection system at H Pile has now been delayed until August. Training lectures and demonstrations for 100 Area instrument technicians have been initiated and similar programs will be conducted for Operations personnel to present the theory and operating technology underlying this improved system.

The design of the delayed neutron detection system for the KER recirculating coolant loops is essentially complete. Major components have been selected but some tests on the composite system remain before the design can be considered firm.

Reactor Safety - Nuclear Instrumentation

Representatives from Manufacturing and Design, Project and Pile Technology Sections have scoped a project for installation of the sub-critical neutron multiplication detector at all piles; a preliminary estimate of project costs is in the order of $300,000. The decision as to whether Manufacturing or Engineering will manage the project has not yet been made. Equipment Development Unit has redesigned the mechanical portion of the installation around a multiple screw mechanism to position the fission counters which is expected to eliminate malfunction resulting from condensate formation.

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Reactor Safety - Tube Outlet Temperature Monitoring

The twelve point prototype tube outlet temperature monitor has not shown any instance of "false" temperature scram signals in several weeks of continuous operation with trip settings suppressed to simulate safety circuit activation as the tube with the highest outlet temperature surpasses the established temperature limit; both normal startups and scram recoveries are included in this interval. A report now in preparation describes the experience to date with this prototype system.

Distribution of Fissions in Irradiated Slugs

A joint effort with Radio-metallurgy has lead to the development of a system to detect the radial distribution of fission products in irradiated slugs. A scintillating crystal gamma ray spectrometer views gamma radiation passed through a small aperture (about 1/8 inch diameter) in a lead shield which otherwise isolates the slug section from the detector. The slug section is mechanically mounted to permit the fission product activity to be scanned along any circumference or diameter. The device has been successful in the limited trials to date and possesses sufficient sensitivity to permit further improvements in resolution by reducing the size of the collimating aperture.

The distributions obtained thus far are consistent with those expected on the basis of (1) accurately measured distributions in lattices at room temperature and (2) crude corrections to these distributions for neutrons at elevated "temperatures". Marked assymetries have been observed (about 10 per cent difference in the fission product intensities at the slug surfaces on opposite ends of some diameters) which is consistent with the effect which would result if the water annulus was not of uniform thickness, e.g., slug cocking. Data made available through applying this technique on warped slugs or slugs which are either near rupture or which have ruptured should assist in determining the importance of in-pile environment on rupture rate as well as permit determinations of internal stresses and changes in metallurgy accompanying given integrated fission history.

Lattice Neutron Economy

The lattice parameters of the K Pile lattice have been summarized in a report "Determination of Lattice Parameters from Experimental Neutron Distributions in Rod Fuel Elements at KW Pile Startup - Part I: Natural Uranium," which is currently in rough draft form. The second phase of the work deriving the lattice constants from experiments in special loadings (J-Q, J-N, E-Q, E-N) is underway and should be reported in a Phase II report in about a month. The third phase -- that of comparing the results of experiment and theory -- has not yet been initiated.

Calculations have been made of the change in reactivity resulting from varying the diameter of the uranium slug in the K Pile lattice; within the uncertainty of calculation, such a modification will have a negligible effect on reactivity when carried through a small range. The effect of changing end cap or can wall thickness will be similar to that previously reported for the older piles.

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Some attempts have been made to isolate thermal neutron detectors which have activation cross sections with a 1/v energy dependence; copper and U-235 have been previously employed as thermal neutron detectors but in both cases a significant portion of the epi-cadmium activation is through resonance capture. Sodium and chlorine appear to be improvements on the basis of cadmium ratio measurements.

Hanford Fuel Test Reactor

A study has been made of the feasibility of testing all slugs received from vendors with a small critical reactor located in an automated line prior to the canning operation; limits could be established so that a given impurity level, or departure from U-235 specification, would automatically cause the sub-standard slug to be rejected. One hundred per cent testing would require that one slug be tested relative to a standard each five seconds over a two shift operation.

Calculations show that a reactor of the (1) Thermal Test Reactor or (2) modified water boiler types possess adequate sensitivity and stability in this application - the requirement for speed dictates a pile oscillator technique for reactivity measurement. It is visualized that the slugs would be mechanically presented to the reactor oscillator which would carry the standard slug in the out-of-phase position. The difference in flux intensity with the test slug in the reactor core relative to the standard, a measure of the reactivity difference, can be amplified electronically and utilized to accept or reject the test slug.

It appears that a thermal test reactor designed to perform this function can be provided for about $100,000 exclusive of installation charges. A modified "water boiler" reactor could be provided for about $75,000. Both have advantages and it is not yet clear which approach will be recommended.

Test Pile - Routine Tests

Uranium slug testing proceeded routinely. Twenty-six Fernald billet egg lots yielded TDS values ranging from 11 to 19; two individual eggs yielded TDS values of 41 and 43 and the billets were scrapped. Eighteen Mallinckrodt billet lots yielded TDS values ranging from 12 to 14. Thirty-five thorium slugs averaged -13.8 inhours in the single slug test.

Test Pile - Special Tests

The graphite comprising the prototype Physical Constants Test Reactor test core yielded a dih (purity) of 1.064 and a density of 1.624 grams per cm^3.

MECHANICAL EQUIPMENT DEVELOPMENT

Charging and Discharging Studies

The fabric type expanding spline for the segmental discharge program has been received for testing. Development effort on this program is currently restricted due to the press of other work.

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Horizontal Rod Studies

The test program instigated to investigate and eliminate the galling of the new CG-558 horizontal rods was completed and document HW-37256, "Project CG-558, Conversion Horizontal Rod and Step Plug Bushing Investigation," was issued.

The final report for the C Pile horizontal rod molded ribbed sphincter seal development test, No. 105-571-A, is being prepared.

Vertical Rod Studies

The final report for the C Pile vertical rod washer seal development test, No. 105-547-A, is being prepared.

The document reporting the past and future test program for air accelerated vertical rods has been completed to rough draft form.

Supplemental Control

Design of the equipment for disposal of irradiated poison splines continued during the month. Development effort on this program has been restricted due to higher priority work.

Preparation of the report of the experiments carried out in the study of the graphite wetting type disaster control system continued during the month.

A rough draft report setting forth further recommendations concerning the previously recommended disaster control systems is being circulated for comment.

Process Tube Assembly and Piping

Further testing has confirmed the superiority of the 0.065 inch wall stainless steel connectors to thinner walled varieties for application to the K Piles. Three and five bend types appear equal in cycle life. Tests indicate that the present cadmium plated brass connector nuts should be replaced by stronger material. Rubber grommet type stainless steel connectors appear to have good cycle life in preliminary tests.

Pressure tests on Resistoflex connectors indicate bursting pressures in the range of 6000 psi. Preliminary tests with cavitating flow through these connectors show no deleterious effects. Strength and ductility tests of teflon and Fluroflex teflon compound irradiated with 10^4 R gamma show increased strength and ductility over un-irradiated material.

The failure of a Resistoflex connector installed on the rear face at C Pile over six months ago was noted. Final examination of the connector has not been complete, but it is believed that failure of the connector was the result of deterioration of the stainless steel braid by attack from chlorine released from a vinyl plastic coating applied to the connector before its installation.

The high temperature-high pressure loop in 189-D is completed except for the application of insulation to some of the components.

The equipment for flanging Zircaloy-2 process tubing is being readied for use in the near future.

A tentative program for design testing of new process tube removal equipment has been outlined. The 9-tube graphite mock-up will be used for this program, with a simulated section of the rear elevator.

Physical Constants Test Reactor

Design of all the components of the reactor has been completed and fabrication is complete except for the moving face position indicator and the source drive. The vertical safety system and moving face framing have been assembled. Assembly of the rear face steel frame, the flux leveling rings, and horizontal control rods is in progress. Electrical connection of the controls will soon be completed.

Other Engineering Development Work

The detailed investigation of the effects of high pushing forces on the graphite stacks at various piles was continued during the month.

Document HW-37405, "A Study of the Hanford Ball Third Safety Systems with Reference to Possible Jamming," was issued. The principal conclusion is that jamming is highly improbable.

Testing indicates that the present power-driven underwater saws can successfully slit zircaloy tubing. Additional test work has been programmed.

The development of a new mechanism for positioning the sub-critical monitor chamber has been initiated.

SPECIAL IRRADIATIONS

KAPL 120 Loop

Installation of the KAPL 120 high-pressure, high temperature recirculating loop is 56 per cent complete. All major items of equipment have been received; all have been installed with the exception of the motor-generator set. Preparations are complete for installing the in-pile tube at the June 29 shutdown of H Pile. A preliminary draft of the operating procedures for the loop have been prepared and are being reviewed.

The cutting of the old tube into specimens for radiological examination has been delayed by difficulties in both hacksawing and underwater cutting arc methods. The shortage of maintenance manpower has also delayed this operation.

Special Loop Study

The feasibility and cost of installing three high pressure, high temperature loops in DR Pile has been conducted jointly with Design and Projects personnel. For purposes of the study it was assumed that one of these loops would be of carbon steel

construction and the other two of stainless steel. A special building would be constructed outside of DR Pile to house the out-of-pile components. On the basis that this building would be done by a lump sum contractor and that the remainder would be constructed by Minor Construction on a CPFF basis, the cost of these facilities was estimated at $4,320,000. Thirty months would be required for the design, installation and testing.

In-Pile Experiments

Two additional experimental assemblies for studying gas-zirconium reactions under controlled in-pile conditions (HAPO 105) have been completed. An effort to charge these into F Pile on June 22 failed due to trouble with shielding pieces. Another attempt will be made at the next shutdown.

An assembly is being prepared for irradiating graphite under controlled temperature conditions (HAPO 124). Instrumentation is also being built up to provide the temperature control.

Fabrication and testing of the hot graphite test facility has been completed (HAPO 128). The facility has been moved to C Pile where it will be installed at the next shutdown.

A portion of the rubber samples being exposed in the outlet end of process tubes in D Pile (HAPO 135) has been pushed due to rupture and leaks in these tubes. Other samples were shifted into different locations inadvertently by maintenance personnel performing leak tests of the tubes. Only twenty-one of 92 samples originally charged maintain their initial status for certain.

Seven of the twelve cobalt samples being prepared for a high intensity cobalt source (HAPO 142) were discharged from H Pile. The remaining samples will be irradiated for another year.

Additional study has been made of induced activities of poison spline material (HAPO 155). Samples irradiated for 48 days were discharged. The initial activity of 10 R/hr/gm/10^{13} thermal flux at one foot in air decayed to 0.1 per cent of this value in 50 hours.

Equipment designed to compare in-pile damage to graphite to that suffered under identical conditions but with the absence of pile radiations (HAPO 158) is still in the testing stage. Difficulties with the oven to used in this experiment have delayed this phase of this work.

The change in the electrical resistivity of asphalt mastic pipe coating is being studied as a function of gamma exposure (HAPO 162). These data are required to assist in evaluating the potential of this material as insulation for piping in future tank farms. No change in conductivity has been observed after an exposure of 2.4 x 10^8 R.

Annular uranium slugs for use with the safety fuse assemblies being prepared by NAA (HAPO 162) are still in the process of fabrication. Flow tests have been conducted demonstrating the adequate annular and core flows can be maintained in-pile

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with these slugs. NAA has advised that iron-constantan thermocouples do not lend themselves to assembly of the fuse. Chromel-alumel couples have been substituted.

A prototype mock-up of a test section for the KAPL 120 loop with SAR fuel ribbons has been received. Tests will be performed in the 305 Pile to determine the power generation and reactivity effects of such a test section in the loop at H Pile.

Production of Co^{60}

At the request of the Brookhaven laboratories a study is being made of the maximum number of curies of Co^{60} that could be produced at HAPO without interference to plutonium production. Co^{60} thus produced would be used primarily for sterilization of food stuffs, chemical processing and other industrial processes. In the event that cobalt can be used as a flattening material there is a potential for producing mega-curie amounts in the HAPO piles.

Facilities

Final revisions are in progress in the design of discharge casks from the Snout facilities. Drawings will be ready to go out for bids in July.

Samples of electrolytic iron were irradiated to evaluate the potential of this material for use as a rabbit material. Decay data show the presence of Mn^{56} and another impurity having a half life of approximately 3 or 4 minutes. Study of other materials continues.

Upon the receipt of criticism of the low compressive strength of special request containers, a study of all hazards resulting from the use of these containers is being made. These containers have been used for the irradiation of materials in the piles for extended periods during the past ten years. There have been no known failures that can be attributed to the containers.

Borescoping

Tube 1293-C was borescoped 6-3-55 to obtain evidence of slug cocking. No unusual conditions were observed. Tube 1269-F was examined 6-22-55. Numerous metal slivers were found upstream from the rear gunbarrel. At 10-1/2 feet from the rear gunbarrel flange a small knurled piece of steel was noted; this object was probably a part of the process tube splitter.

A swab and two slivers of process tubing 29 feet from the front gunbarrel flange were found in tube 3455 F on 6-21-55. These articles resulted from a tube splitting operation. The graphite in this channel appeared to be in good condition with no cracks or splits being apparent.

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PILE MATERIALS SUB-SECTION

PILE GRAPHITE STUDIES

Effect of Helium on D Pile Distortion, PT 105-546-E

This production test will be concluded following the extended shutdown at D Pile on June 27. Vertical bowing traverses were obtained June 20 on the three regularly-measured process tubes, 4453, 4674, and 4494. Measurements were made from both the front and rear faces. Little change in distortion was observed with the exception of process tube 4453 which is considerably higher in elevation than when previously traversed. Another traverse of this tube will be made during the extended outage.

C Pile Graphite Burnout Experiment, PT 105-548-E

The sporadic operation of C Pile has continued and equilibrium graphite temperatures have been somewhat lower this month. The first graphite samples will be removed from process tube channel 2773 next month.

Following the discovery that one or more of the thermocouples in the follower furnace had failed, the furnace was dismantled and all thermocouples replaced with stainless steel-sheathed chromel-alumel thermocouples. The elimination of gas leakage has been accomplished by filling the condulet boxes with black wax. Gas flow through the furnace was calibrated against pressure drop following the installation of an orifice which provides gas flow comparable to that through a perforated pile gun barrel. The furnace and control system will be tested early in July.

Skewed Temperature Distribution for Fringe Graphite Annealing, PT 105-553-E

This production test has been approved for D Pile; however, it will probably not be put into effect until more of the graphite thermocouple stringers at D Pile have been replaced. A delay of the production test authorizing a bulk outlet water temperature of 100 C will result in pile operation at a maximum graphite temperature lower than the 650 C temperature authorized by PT 105-553-E.

Mechanical Strength of Graphite

Shear and tensile strength measurements have been made on CSF and TS-GBF graphites. The results obtained indicate that the shear strength of CSF graphite is 2000 pounds per square inch when the load is applied in a direction parallel to the axis of crystallite orientation and 3600 pounds per square inch when the load is applied in the transverse direction. The values for TS-GBF graphite are 2800 pounds per square inch and 3000 pounds per square inch respectively. The tensile strength of TS-GBF graphite in the parallel direction is found to vary from 1600 to 2100 pounds per square inch. Effort is being made to correlate the mechanical properties of the various graphites used at Hanford with the oxidation of these graphites.

The examination of graphite pore size distribution and the effect of this property on the oxidation rates of graphite in various oxidizing atmospheres is being continued. Further experiments are being conducted to determine the effective depth of penetration of oxidizing atmospheres into graphite.

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Stability of Chromel-Alumel Thermocouples at Elevated Temperatures

The recalibration of 12 chromel-alumel thermocouples has been completed after their respective exposures in air, helium, carbon dioxide, and carbon dioxide plus graphite at 1000 C for periods of 2, 21, and 100 hours. The thermal emf of each test thermocouple was compared to that of reference chromel-alumel thermocouples at 1000 C and deviations from these standards are tabulated below.

In Air:
- After 2 hours - no significant change
- After 21 hours - no significant change
- After 100 hours - (+) 5 C

In Helium:
- After 2 hours - no significant change
- After 21 hours - (+) 3 C
- After 100 hours - (+) 6 C

In Carbon Dioxide:
- After 2 hours - no significant change
- After 21 hours - brittle. Chromel wire broke.
- After 100 hours - brittle. Alumel wire broke.

In Carbon Dioxide Plus Graphite:
- After 2 hours - (-) 4 C
- After 21 hours - brittle. Chromel wire broke.
- After 100 hours - brittle. Chromel wire broke.

The results of this test indicate that bare chromel-alumel thermocouples at 1000 C in air and helium atmospheres are relatively stable mechanically and thermoelectrically. However, in carbon dioxide atmospheres, both chromel and alumel wires are weakened after 20 or more hours to a condition in which no bending can be tolerated without partial or complete breakage.

GRAPHITE AND MATERIALS DEVELOPMENT

Dimensionally Stable Graphites

The cooperative program with Battelle Memorial Institute for the purpose of developing a dimensionally stable graphite was discussed with Battelle personnel during the month. It was agreed that the problem of stability under low temperature irradiation essentially has been solved by the development of Korite coke graphites and resin coke graphites. Irradiation of these materials at high temperatures has shown a pronounced physical contraction which may make them unsuitable for central zone graphite. Before attempting to develop a high temperature stable material, the possible causes of this contraction will be studied. The discussions resulted in the consideration of the following possible causes of the contraction.

1. Further ordering of the graphite planes with resultant decreases in the Co parameter.

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2. Graphitization, under irradiation, of ungraphitized material.
3. Closer packing of crystallites into the micropores within a coke particle.
4. Complete vaporization of crystallite groups by neutron bombardment with a resulting higher degree of order after recrystallization.

As a result of these discussions, X-ray measurements were made on samples exposed at high temperature. A group of Korite coke and Sterling carbon black graphite samples which were irradiated in an uncooled process tube exhibited physical contraction in both the transverse and parallel directions. These results along with Co measurements are listed in the following Table. Pile grade graphite samples of KC and CSF material which exhibited physical expansion in the transverse direction are also listed.

TABLE I

HIGH TEMPERATURE IRRADIATION OF GRAPHITE SAMPLES

Graphite Transverse Cut	Exposure MD/CT	Temperature of Irradiation	Physical Distortion, %	Co Initial	C_o, After Exposure
Korite	820	475 C	-0.15	6.77	6.82
Sterling	820	475 C	-0.15	6.80	6.86
KC	820	475 C	0.03	6.71	6.74
CSF	820	475 C	0.02	6.71	6.74
Korite	330	325 C	-0.02	6.77	6.85
Sterling	330	325 C	-0.02	--	--
KC	330	325 C	0.03	--	--
CSF	330	325 C	0.02	--	--

It is obvious from the C_o measurements that the average interplanar spacing is increasing rather than decreasing under high temperature bombardment. Therefore, the first cause of contraction listed above is probably incorrect. A series of samples with various degrees of graphitization of the binder are being synthesized by Battelle. High temperature radiation effects on these samples will be studied.

Gamma Stable Elastomers

Several samples of silicone and flourocarbon elastomers were received from R. W. Pitman of Reactor Process. The gamma radiation stability of these materials will be tested by exposing them to radiation from spent enriched metal slugs in the storage basin of a pile. Irradiations of this type will be made under conditions of controlled temperature and atmosphere. It is planned to irradiate some of the samples under mechanical stress to determine the effect of stress on radiation stability.

High Temperature Irradiation Facility

The fabrication of the prototype section of the proposed facility for installation in the MTR continued in the shops. Testing of the prototype will take place during July. A thermal conductivity device has been designed to measure the samples that will be exposed at high temperature in this facility. This device will measure the conductivity of disks approximately 0.1 x 1.25 inches.

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Exchange of Information with AECL

Dr. L. G. Cook of Atomic Energy of Canada, Limited, visited HAPO during the month. During the visit on June 15, there was an exchange with HAPO people of detailed classified information on irradiation effects in graphite. Dr. Cook described stored energy apparatus and data of the Canadian laboratory. He was shown the Hanford equipment and brought up to date on Hanford stored energy data. Certain differences between Canadian and American results were noted and it was agreed that a sample exchange should take place between the two sites in order to establish an absolute measure of stored energy. Recalibration of the stored energy equipment has begun in anticipation of receipt of Canadian samples. Details of the meetings may be found in HW-37479.

Thermal Conductivity Apparatus

An apparatus to measure the thermal conductivity of certain types of graphite samples more quickly than is possible with the Kohlrausch equipment has been designed and put into use. This apparatus, known as the Mark I, raises the sample temperature as high as 90 C, thus making it unsatisfactory for low temperature irradiated graphite. However, it will be used for virgin graphite and high temperature irradiated graphite.

Thermal Annealing of Damaged Graphite

The Vand method which was used to obtain the activation energy spectrum for annealing of damaged graphite includes the assumption that the process occurs by a first order mechanism. With the data now available, a definite choice cannot be made between first and second order kinetics if allowance is made for distribution of activation energies. It has been discovered that if the process is not first order, the effect on the activation energy spectrum is to decrease the resolution slightly. The resolution of a single activation energy line from a first order process as measured by the half-intensity band width has been found to be about 30 per cent better than the resolution of a line resulting from a second order process. A description of the experimental work and application of the Vand method is described in a formal report "Thermal Annealing Kinetics of Interlayer Spacing Damage in Irradiated Graphite," HW-37406. This report was presented in part to the Northwest Regional Meeting of the American Chemical Society at Eugene, Oregon.

RECIRCULATION TECHNOLOGY

Recirculation Studies

The H in-pile loop operated at 200 C during the month with pH maintained in the range 5.2-5.4. Following the development of procedures to maintain pH in this range, the charge of dummy slugs was replaced with regular metal. Some difficulty resulted from crimping of the rear end of the zirconium tube and from failure of the mechanical seal in the high pressure pump.

A study was initiated to determine the economic incentive for conversion of existing piles to recirculation cooling. In addition to up-dating a previous report on the subject, this study will evaluate operating problems of piles running at powers of 200 per cent and 300 per cent of present levels, in an effort to better define the optimum direction of present recirculation development work.

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A report was completed describing the various water treatment procedures required for reactors cooled by high temperature recirculating water. A study was made to compare various purification techniques for reactor primary cooling water. A preliminary conclusion is that the make-up and bleed method is cheaper than high pressure by-pass and clean-up techniques at all power levels. Further comparison is underway between make-up and bleed and low pressure by-pass and clean-up.

Seven slug rupture tests were performed in the ELMO-4 loop. Several types of slugs ruptured without blocking tube flow: warning layer, wafer type, rod clusters in Al-Si, and uranium oxide slugs. In the latter case, the slug appearance was unchanged following 57 hours exposure at 260 C.

Construction of the carbon steel loop by Minor Construction was about 50 per cent completed. Delivery of the Babcock-Wilcox loop was delayed until August. Some progress was made in the installation of the thermal convection loop in 1706-KE.

KER Recirculation Test Facility

Installation of equipment in 1706-KER was begun by Minor Construction forces. The operating procedure for the building was revised and is being reviewed by Operations personnel. Discussions were held with Metallurgy personnel regarding fuel element testing in one of the KER loops. The question of recharging elements following examination was considered. Although the handling problems are severe, the procedure would provide much better metallurgical information than single exposures of the elements; also this procedure may be necessary because of the limited number of slugs available for use under KER conditions.

Invitations to bid on ten 15 foot lengths of KER cross section zircaloy-2 process tubing were declined by all nine vendors contacted. Letters of comment from these vendors are being evaluated and a decision of the next step to take will be made soon.

A requisition for four 50 foot lengths of ribless KER tubing is being held up until evaluation of the response from the above order is complete. A requisition for six stainless KER ribless tubes is now being prepared and will be placed in the hands of Purchasing soon.

Semi-Works Operation

Operation of seven in-pile 1706-KE tubes continued during the month, using water controlled at pH's 7.0, 6.5, and 6.0.

A pile scram resulted from inadvertent cut-off of the 1706-KE instrument air supply. Numerous difficulties have been encountered with the chemical addition system; a major part of the month was spent in improving the system. A total of 40 autoclaved fuel elements were placed under mock-up testing as requested by Fuels Technology personnel.

Several revisions, additions, and improvements are underway in 1706, including installation of an electrolytic slug cleaner, provision of an outdoor pad for chemical storage, partitioning of the lunchroom and office, and installation of service facilities for test loops now on order.

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All material for the single-pass in-pile boiling facility has been placed on order. Dismantling of the 105-F Flow Laboratory was completed. Installation of ELMO-2 in 1706 was begun.

Process Water pH Evaluation

The final report of the low pH production test at 100-F was completed. Essentially all of the corrosion information from the series of tests at 105-D Flow Laboratory is now available, and the final report is nearing completion. This report presents in-pile corrosion data in process water at pH's of 7.3, 7.0, 6.6, and 6.2 and raw water at pH's of 7.5 and 7.0.

PILE COOLANT STUDIES

Production Tests

One-half of the D Pile has now operated for a year on 0.5 ppm sodium dichromate under PT 105-542-E. Recently, severe corrosion attack has been noticed on some of the hotter tubes running with low dichromate. Data are not yet available on hot tubes running with normal dichromate concentrations. It is planned to remove enough tubes at the extended shutdown to determine if low dichromate or high outlet temperatures are the principle cause of this attack.

One of the zirconium-canned slugs in the second process tube charged at C Reactor under PT 105-552-E ruptured on June 2, after 14 operating days exposure. In this tube four unbonded zirconium-canned slugs were being evaluated. The rupture piece was located in the center of the tube. The end cap had come off and the surface of the can was covered with cracks as if the zirconium was very brittle. The other zirconium pieces appeared to be in good condition with the exception of one piece located in the downstream section. This slug had a small crack near one end. However, from the appearance of the crack there is a good chance that this damage occurred during discharge. The metal in the tube had reached an average exposure concentration of 100 MWD/T at failure. The tube power averaged 900 KW and the average outlet temperature was 90 C. During the exposure of these slugs the pile had been shut down and started up a total of 14 times.

Corrosion Monitoring

Eleven process tubes were examined during the month. Six of these tubes were rupture tubes from C Pile and in each of these tubes there was indications of cocked or misaligned slugs.

Two leaking process tubes were removed from the central zone of D Pile in a one-week period. The corrosion attack on these tubes was of a type best described as a combination F-type, ledge type corrosion. The areas of heavy attack where the leaks occurred were between the ribs. In these heavily corroded areas the minimum tube wall thickness measured was 10 to 14 mils, while the average was about 25 mils. At other spots in the tube where severe local corrosion had not occurred, the tube wall was 40 to 50 mils thick. The ribs in this section of the tube had been reduced 40 to 50 mils in height, resulting in a higher local water temperature in the area of severe corrosion. Other tubes are being removed from D Pile to determine the extent of this condition.

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An unclad 2S aluminum process tube was removed from D Pile after eight years in-pile. The appearance of the tube was as good as has been observed on 72S clad tubes, except that a few front tube pits had penetrated half-way through the tube wall. This tube furnished further evidence that 72S cladding on the inside of process tubes is not needed if a four or five year retubing cycle is adopted.

Horizontal rods, number 1, 2, 3, 4, 5 and 6 at DR pile, were examined for corrosion. No evidence of corrosion was observed on any of these rods. The number 3 rod had some corrosion on the outer end, which never enters the reactor. A few water stains were observed on rods number 1 and 3 but no pits or other indication of corrosion was present. The number 2 rod had a black deposit along the rod for about 150 inches. This deposit did not appear to be a corrosion product but it was quite hard and did adhere to the rod. An analysis of this deposit will be made.

Laboratory Corrosion Tests, 1706-KE Operation

Water supply to seven in-pile tubes was continued during the month. These tubes are being supplied filtered water containing 2 ppm sodium dichromate with pH adjustment to 7.0, 6.5 and 6.0.

Plans were made to move the temperature sensing elements to the rear pigtail from their positions on the special drain headers at the side of the rear face. This is being done to eliminate the need of supplying water to the special drain header to obtain temperature readings. Draining water through these special headers affects the instability limits of these tubes. Plans were also made to obtain special front pigtails which will be as reliable as the new pigtails to be installed at the K Areas.

A corrosion test of eight inch metal slugs is being run in the 1706-KE mockup for Fuels Technology Sub-Section. Data are being obtained in pH 7.65 water containing 2 ppm sodium dichromate at a temperature of 120 C. In conjunction with this test the corrosion behavior of 2S and 72S aluminum perfs is being obtained. Data are being obtained on annealed and unannealed samples of each alloy in both the autoclaved and unautoclaved condition. These data are being obtained in order to make a correlation between in-pile slug and tube corrosion data.

Two minitube mock-up installation at 1706-KE have been completed and tested. Final adjustments, loading and lagging of the equipment will be completed and startup of the units will be accomplished in the next few weeks.

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FUEL TECHNOLOGY SUB-SECTION

FUEL ELEMENT DEVELOPMENT

Core Materials

The yield of acceptable slugs from heavy walled extruded tubing has shown a continued improvement as illustrated by NLO inspection results in Table I.

TABLE I

YIELD OF ACCEPTABLE SLUGS FROM HEAVY WALLED TUBING

Month of Extrusion	Inspection of Hole Yield - percent	Metal Quality & Machining Yield - percent
October & November	65.5	70.0
December	57.4	73.4
January	71.8	80.8
February	76.1	88.1
March	72.7	79.5
April*	82.9	85.3

* Partial on 54 of 181 tubes

Additional experience has shown that reduced quench pressure definitely eliminates the extended cracks in the lead end of the tube and, along with guides in the quench tube, results in extruded tubes that do not require straightening prior to heat treatment. Adjusting the position of the tip with respect to the land of the die has virtually eliminated rejects for oversize and elliptical holes in the extruded tubing.

The MCW development program has produced dingots of both 1400 and 3300 pounds. Density continues to be high for the dingot uranium and the chemical impurities are low with the exception of the hydrogen content as compared to ingot uranium. High (good slug to slug) yields of 94% to 97% have been obtained on recent dingot uranium processed at the FMPC.

Tensile data obtained from testing axial samples from various types of uranium in the temperature range of -23 C to 200 C indicate: (1) that there is a gradual transition from low ductility to high ductility for all types of natural uranium tested in the range of 40 to 70 C; (2) that the ultimate tensile strength for all types of natural uranium tested was a maximum in the range of 40 to 70 C; (3) that there were no significant differences in ultimate tensile strength or elongation between uranium that had been formed to rod by rolling or extrusion; (4) that the ultimate tensile strength of dingot uranium is approximately 8000 psi lower than ingot uranium at room temperature but this difference essentially disappears above 125 C; (5) that there is no difference in the elongation of dingot uranium as compared to ingot uranium in the range of -23 C to 200 C; (6) that the ultimate tensile strength and elongation of uranium in the as-extruded condition is higher than after a beta heat treatment; and (7) that uranium - 0.35 atomic percent chromium alloy loses approximately 15% of its room temperature strength at 225 C as compared to approximately 45% for natural uranium.

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Special Problems

A program to establish the real limits with respect to high power irradiation of massive fuel elements was outlined. In the course of this program, encompassing the irradiation of slugs with normal and greater than normal U-235 content, an attempt will be made to separate the effect of pile variables upon the metallurgical characteristics and the distortion of the core. Among the core characteristics to be investigated are the internal diameters of cored slugs, the effect of slug length, the effects of heat treating variables, and further metal quality improvements.

Preliminary tests by torsion impact have shown a distinct average difference of 47 ft.-lbs. between as-rolled and beta heat treated uranium samples with no overlap in the range of test results. In view of this promising difference, a series of 30 additional torsion impact specimens are to be machined to test the effects of canning upon torsion impact results and to develop a correlation with notch bend test results.

So high temperature cycling in the woodsplitter may be considered a feasible test, it must be demonstrated that some coating, which will not unduly effect the temperature distribution within the core, will survive the repeated rigors of the woodsplitter cycle without deterioration with water temperature of 20 C to 250 C. A test was initiated to determine whether a two mil nickel plate will provide this needed protection against corrosion during high temperature cycling.

As a service to the Fuel Assembly Unit, 308 bare I & E slugs to be used in production test 313-45-MT were inspected for surface seams and striations prior to nickel plating. Forty-one percent had no visible seams or striations, 47% had no seams, and all visible striations were less than 1/2" long. Twelve percent were rejected.

Zirconium Development

Mechanical properties of uniskanned zirconium and zircaloy-2 were found to depend upon the orientation of the test specimen with respect to the direction of cold working. A zirconium tube in H pile which had become constricted at the discharge end because of excessive tightening of the ferrule fitting was repaired sufficiently to permit discharge of slugs by driving a tapered mandrel into the constricted end. A satisfactory method of heat treating zircaloy-2 cans to permit Heliarc welding without bulging at the mouth has been developed.

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Induction Heat Treating

Facilities for vertically heat treating uranium rods by induction have been set up and four experimental heats run under various conditions. No set of conditions providing the desired fine randomly oriented grain was found among the four trials; however, many combinations of conditions remain to be tried.

Jacketing Development

High purity aluminum with magnesium added, known as Lurium-5 and Lurium-10, were autoclaved after various heat treatments to determine corrosion resistance. All samples showed evidence of intergranular corrosion after 40 hours in 100 psig steam.

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Study of cold-pressure weld slugs discharged after irradiation under PT 105-584-A indicated that a high percentage of these slugs were in excellent condition after approximately 500 MWD/T exposure, the exceptions being due to corrigible causes and not to conditions inherent in the cold closure canning process.

Tests designed to correlate cold closure punch dimension with closure quality have shown that other, as yet unidentified, variables play an important part in determining such quality.

FUEL ASSEMBLY DEVELOPMENT

Surface Defects in Autoclaved Slugs

The number of slugs rejected for surface defects after autoclaving has increased from about 1/2% in February 1955 to an average of about 7% currently. In addition to the undesirability of high autoclave reject rates, the increase in surface defects in the canned slugs may be contributing to the low exposure ruptures (particularly in C pile) of pieces which were canned during February through March at a time when the 100% visual inspection of slugs prior to charging was discontinued.

Examination of rejected slugs after autoclaving has revealed surface inclusions in the can wall of the following nature: (1) shallow pits containing various colored corrosion products; (2) mechanically imbedded particles; and (3) surface discoloration. The high autoclave reject rate is coincidental with: (1) the use of new autoclaves in the 313 building; (2) the transition from steam to water autoclaving; and (3) a change in the cleaning procedure in which nitric acid cleaning of the steel autoclaves and aluminum slug separators was discontinued.

Autoclave reject slugs are being examined to determine the nature and probable source of the defects. One laboratory flow tube has been charged with selected slugs having various types of surface defects to estimate the in-pile effects of 120 C water. Four hundred reject slugs were re-etched and re-autoclaved. Pits from the initial autoclaving were uniformly covered with film during re-autoclaving, but new defects were found on about 5% of the slugs tending to confirm that autoclaving is a major source of the defects. One bank of five autoclaves has been repiped for steam autoclaving to compare the difference on a controlled basis between steam and water autoclaved pieces. The autoclave and adjoining piping are being examined for possible sources of corrosion due to undesirable construction materials.

Hot Press Canning of "C" Alloy Cores

A recommendation was made that all hot pressed "C" slugs made to date be tested using the "no count" bond testing procedure and the acceptable slugs meeting the other specified requirements be shipped to the piles for irradiation. The "no count" test procedure consists of setting the equipment sensitivity so that 110 ± 10 counts are recorded when using the standard slug.* Only those production slugs for which no counts are recorded (other than background counts) are then acceptable. The use of this test is based on the association of large weakly-bonded

* As specified in "HPA" Canning Process, Specification 12.0

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areas adjacent to ultrasonically - detectable unbonded areas, whereas slugs with no unbonded areas have been found to contain only a few small areas of moderate bond strength, that are partially diffusion bonded. The HPA process specifications will be revised to specify the "no count" procedure.

The canning of 1.352-inch diameter "C" alloy cores procured for hot press canning was completed. Hot press canning was continued using 1.343-inch diameter cores originally procured for "C" process (unbonded) canning. Canning of 5000 of the smaller cores was authorized by waiver.

Cored Slugs with Aluminum End Plugs

Four control tubes of cored slugs with aluminum end plugs were charged in C pile June 19 under PT 105-593-A for exposures to 200, 600, and 900 MWD/T. Four other tubes are to be irradiated to rupture in C pile under PT 105-593-A, Supplement A. The remainder of the 2400 slugs canned are to be lot charged in D pile. Production test 313-47-MT, Supplement D now authorizes the fabrication of production quantities of similar slugs in lieu of the welded uranium end plug type.

Low Impurity Canning Line

An average dimple reject rate for all canning lines including line 6 (the low impurity line) during the latter part of this month was approximately 1% with an associated lead content for all lines of 0.18% - 0.20%. An investigation is being conducted to ascertain the reason for the sudden decrease in lead content in the canning baths from a level of 0.34%, May 9, to the present average. Since more effective skimming of the interface during this period may have reduced the lead carry-over to the canning bath, interface skimming has been discontinued on the line 6 duplex bath to determine if a corresponding increase in lead content of the canning bath will result.

The effect of slug core surface on the amount of lead adhering to the slug during the duplex immersion is being studied. Slugs from rod-treated Mallinckrodt uranium were processed to provide slugs with four surface conditions and were then processed through the duplex bath of the lead dip process. The following analyses for lead retained on the slugs following removal from the bath were obtained.

Surface Treatment	Grams Lead/Slug
Chloride salt-treated, machined surface	1.1
Chloride salt-treated, ground surface	1.6
As machined surface	0.1
As ground surface	0.7

These data indicate that the decrease in lead content of the canning baths is associated with two recent changes in slug core processing: (1) the cessation of salt bath outgassing and local heat treatment in slug form; and (2) a gradual change-over from slugs with a ground finish to slugs with a machined finish. Sixteen additional slugs have been processed in a similar manner and submitted for analysis to verify this limited test.

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PT 105-552-E, Unbonded Zirconium Slug Failure

A rupture occurred in an unbonded zircaloy-2 jacketed slug charged under PT 105-552-E. The slug failed at an exposure of 100 MWD/T and was characterized by longitudinal jacket breaks and surface bumps. The failure was similar in appearance to the autoclave failures previously experienced on this group of slugs during canning. Because the zircaloy-2 cans were of known poor metal quality, it is felt that the rupture was undoubtedly caused by water entry to the slug core through a jacket defect and that subsequent embrittlement of the zircaloy caused the numerous jacket splits.

The three remaining unbonded zircaloy-2 jacketed slugs showed no signs of incipient jacket breaks. There was no sign of adverse corrosion attack on the jacket or the cap end. The weld bead and the heat affected zone on the cap had not been subjected to preferential corrosion attack. At the present time, it appears that the welding and sizing procedures used in fabricating unbond zirconium jacketed slugs of the design tested are satisfactory and did not adversely affect slug performance during irradiation.

Double Length "C" Slug Fabrication

The fabrication of hot-pressed canned double length "C" slugs having Truline features was demonstrated as feasible this month. Two single length hot pressed "C" slugs having the Truline features were butted base end to cap end and Fillerarc welded according to procedures described in last month's report. Axial alignment was acceptable for the 15 pairs that were fabricated.

Production test 313-58-MT has been prepared to authorize double length "C" alloy slug fabrication starting in July 1955. The test calls for 750 double length "C" alloy slugs canned by each the "HPA" process (hot press bonded) and the "C" process (unbonded). The "HPA" canned slugs will have the Truline features on the slug ends.

Aluminum Can Quality Investigation

Considerable attention has been focused on the integrity of the aluminum jacket on Al-Si bonded slugs as a result of the recent high incident of low exposure (300 MWD/T) slug failures. The use of the MIZ-1 penetration detector calibrated for high sensitivity by the Fuel Technology Testing Unit has apparently been successful in detecting internal can wall defects in some aluminum cans. In addition, one canned slug rejected by the penetration tester on the production line produced an unusual pattern that was interpreted as indicating defects in the can as well as an Al-Si penetration. Those defects located by the high sensitivity MIZ-1 have been small voids and non-metallic inclusions ranging from 5 mils to 30 mils in size. Some of the defects were semi-continuous from one edge of the can wall through to the opposite edge.

The defects found by the production penetration tester on the one slug were associated with a penetration area and may actually have been cause of the penetration. There was evidence of an extremely large void or several closely grouped smaller voids in the can wall in the region of the penetration. The area of the possible void(s) appeared to be about 1/2 square inch. Adjacent to the penetration were small voids (20 mils in size) and several areas on the inner can surface exhibiting folds and laps.

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Further work is planned toward identifying types of defects found in cans, attempting a correlation between oscilloscope patterns and defects, and establishing frequency of occurrence of defects in the aluminum cans. It is anticipated that a significant and practical separation of production cans can be achieved by development of this eddy current test device.

Automatic Quench Evaluation

It is apparent from the evaluation of the automatic quench equipment (based on comparative destructive examination of slugs processed by both the automatic and manual methods of quenching) that the characteristics of the automatic quench are approximately equivalent to that of the manual quench and early incorporation of the automatic equipment as planned is desirable. In slugs quenched automatically a slightly higher braze porosity between the cap and can was indicated. The difference, however, is not significantly great to preclude use of the quench equipment as currently designed. Measurement of the respective braze line widths for the two methods of quenching indicated that the eccentricity of the cap seated by the automatic quench may vary considerably more than when manually quenched. An average difference of 16 mils between the minimum and maximum width of the braze lines of machine-quenched slugs was found as compared to a 7 mil average variation for the manually quenched slugs.

Alternate Final Etch

The use of hot concentrated HNO_3 (60% at 80 C for 5 minutes) in the new final etch machine, 313 building, as specified, has led to a corrosion problem to the assembly and a large loss of HNO_3 in the fume exhaust system. Two alternate methods have been investigated for replacing the above method: (1) a 5% NaOH solution at 50 - 60 C for four minutes followed by a cold 10% HNO_3 dip; (2) a 15% to 30% HNO_3 solution at 80 C for 5 minutes. Both of the alternate methods are satisfactory for cleaning the slugs and detecting Al-Si penetration. The low concentration acid procedure has been placed in use since equipment changes will not be required.

Internally and Externally Cooled Fuel Elements

Hot press internally and externally cooled fuel elements have been canned with three hole sizes (3/8, 7/16, and 1/2 inch) for in-pile cooling water temperature tests. These tests will establish the dimensions for an I & E fuel element which will give equal hole and annulus outlet water temperatures. Examination of a group of 3/8" and 7/16" pieces disclosed the random presence of rings of entrapped pin lubricant in the can base tube-weld area. Sectioning a number of these pieces showed the tube wall integrity to be impaired by the embedded material. Investigation of the cause revealed that lubricant was scraped from the pin during pin insertion into the tube prior to hot pressing, and that the two piece hot work punch (HW-35942) was depositing it near the cap-core interface. Removal of the lubricant buildup prior to pressing, together with recessing the punch to provide a lubricant trap, alleviated the problem.

In some of the pieces examined for lubricant entrapment, tube wall thinning occurred in the can base tube weld area. The type of phenomenon noted is a function of the clearance between the fuel element assembly and the pressing die component with which it is in contact, in this case, the pin. By decreasing the

pin-tube clearance from ten mils to five mils the thinning problem was brought under control.

At present the 3/8" and 7/16" pieces are being weighed and measured prior to shipment to the pile. The 1/2" pieces are being cleaned and autoclaved.

Effect of Temperature on Hot Press Closures

A study was begun on the effects of temperature upon solid state welding of simulated hot press closures. It was found that the weld strength (which is a measure of the depth of weld) is nearly linear with temperature, increasing from 2000 psi at 400 C to 9000 psi at 600 C. The specimens were prepared in the same manner (scrub and deoxidize) and pressed at 12 tsi for 10 minutes at the various temperatures.

Single Stroke Hot Work Punch

The integrity of an aluminum-aluminum weld can be improved by hot working the interface to be welded. A method has been devised in which the cap-can interface is forced through an annular gap during the pressing operation. This single stroke, two piece, hot work punch results in a much longer weld interface, a thicker residual can wall, and considerable equipment simplification than that possible with the double stroke hot work punch. It is planned to use the single stroke, hot work punch on the next hot press production test.

Temperature Distribution in Dies

Gang Press. The temperature variation axially along the slug-can interface during hot press canning in the four-hole die block has been measured at a controller setting of 600 C. Equilibrium temperatures at the bottom end of a special thermocouple slug were made a year ago with a different type of thermocouple slug indicated that this maximum variation was 30 C instead of 60 C. Differences in the thermocouple slugs used in the early and late tests are believed to account for most of the increased temperature spread. A heavy deposit of decomposed lubricant was removed from the dies and a second series of tests was made. No difference in the temperature was noted.

Single Press. The temperature distribution along the length of a uranium thermocouple slug, measured at the surface of the uranium, showed that the single unit furnaces were not heating the assembly as previously indicated with aluminum thermocouple slugs that measured the temperature along the slug axis. Thermal differences of 51 C were observed from end to middle using the uranium slug and 15 C using aluminum slugs. Results reported previously indicated little difference between aluminum and uranium thermocouple slugs. However, these previous measurements were made in the center or along the axis of the slugs, while these more recent temperatures were taken on the surface of the slug just beneath the jacket, i.e., nearer the heat source.

Cold Closure Process

The deformation of cold-closed wafer slugs and cartridge slugs under 150 tons closure pressure is not significantly greater than that of one-piece (solid) slugs closed under the same pressure. A slug composed of four 2" cartridges and one

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consisting of thirty-two 1/4" wafers without separators both became slightly barrel-shaped under 150 tons force, enlarging a maximum 0.014" and 0.015", respectively, on the diameter at approximately 2" from the bottom. A one-piece slug enlarges 0.013" under similar conditions.

A 36" long cartridge slug consisting of eighteen 2" long uranium cartridges was assembled by sizing over the slugs a 0.058" wall aluminum tube with welded end caps ("C" process canned). This slug has the advantage of a reduced number of closures exposed to the coolant water.

Vacuum Braze Canning

Vacuum canned braze bonded fuel elements have been shown by previous experimentation to be potentially superior to standard dip canned slugs. This type of fuel element, particularly one internally and externally cooled, may withstand the more rigorous pile operating conditions.

A study has been made of the factors which tend to influence the critical variables encountered in braze bond slug assemblies. This includes slugs canned by the manual lead dip process as well as those experimentally vacuum canned. Such undesirable characteristics as bond voids, oxide formation, can wall penetration, gross inclusions, wide braze line and frangible bonds are typcial of the variables found in present lead dip canned slugs. It is thought that the above variables can be controlled by an adequate vacuum assembly process. Design of a unit by which eight-inch solid or I & E slugs can be canned in vacuum is currently in progress.

Production Test of Cored Enriched Uranium

The effect of increased pile power on cored lead dip canned fuel elements is being investigated in a production test utilizing uranium enriched to 1.75% with U-235. Two tubes containing 16 four-inch cored (3/8" hole) fuel elements with welded uranium end plugs, two tubes containing 16 four-inch cored (3/8" hole) fuel elements with pressed aluminum end plugs, and two tubes containing 16 four-inch cored (5/8" hole) fuel elements with pressed aluminum end plugs will be exposed to rupture, one rupture in each set.

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Fuel Element Pilot Plant

The revised project for the Fuel Element Pilot Plant was approved by the Atomic Energy Commission. The revised project essentially provides funds for consolidating development facilities now located in various buildings into the 306 building, pilot plant, and provides for the construction of an office area on the mezzanine floor.

FUEL EVALUATION

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Irradiation Status of Production Uranium

Regular production slugs fabricated from uranium cast into seven-inch diameter ingots (K, L, M, N, P, and Q lots) constitute 80%* of present in-pile inventories and 700 tubes have been irradiated to 600-900 MWD/T. This irradiation experience

* Percentages, number of tubes, and exposures are approximate values.

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does not establish its quality relative to slugs of older vintage. Excluding all charging at 105-C and H, 12,000 tubes about equally comprised of rod transformed (K and M lots) and slug transformed (L and N lots) have been charged. Of these 2500 have been discharged below 250 MWD/T, 500 between 250 and 600 MWD/T, and 100 over 600 MWD/T. Excluding 105-C experience, thirteen failures of seven-inch ingot uranium stock have occurred during the past four months, generally in the 200-250 MWD/T and the 600-700 MWD/T ranges, but uranium quality does not, at present, appear to be a major cause. All have been side failures except for a uranium split at 700 MWD/T and an unclassified type at 600 MWD/T. Although slug transformed (L and N) lots have sustained twice as many failures as the rod transformed (K and M), investigation of canning and charging information indicates this difference is probably not due to uranium quality.

Examination of Slugs from Low Exposure Rupture Tubes

Examination of slugs from five low exposure rupture tubes from C pile revealed one slug, in addition to the ruptures, which showed evidence of local overheating of the jacket. Five tubes were examined visually and weaseled; slugs from two of these tubes were measured for warp and diameter. The position of the ruptures in the tube were determined from film and weasel data. It was concluded that four of the five ruptures occurred downstream of center in areas where surface temperatures and corrosion rates are the highest (positions 10-15 from the downstream end). The remaining rupture was determined to be the second slug from the downstream end of the tube. The level of warp was low, 13% of the slugs in the two tubes measured warped between 20 mils and a maximum of 33 mils. The slug with maximum warp was located in tube 0969-C at a position adjacent to the rupture by weasel and film data. The concave side of the warp was near the rib marks. The convex side appeared to have been exposed to higher temperatures than the rest of the slug as indicated by a lighter colored scale or film. Thirty mils of warp in itself would not reduce the water flow enough to cause this filming or scale formation. The warp may have been the result of differential heating of the slug as might be caused by column bowing. The slug is being held for radio-metallurgical examination. No significant diameter changes were noted on the slugs measured.

Slug Distortion

Slugs which were irradiated in C pile at 750-850 KW tube power showed more warp than slugs in the old piles at similar exposures but at 400-500 KW tube power. At 800 MWD/T the maximum warp measured in tubes at 800 KW was 82 mils while at similar exposures but at 500 KW the maximum warp was 78 mils. Further. 33% of the slugs at the high power warped between 30-80 mils as compared to 27% of the slugs at the low power. The slugs from the high power tubes showed the same tendency noted earlier on the low power tubes to show the maximum warp in the front part of the tubes. These data were compiled on 25-M slugs which showed a high rupture rate and are generally considered poor quality. However, one tube representative of present slug quality at 900 MWD/T and 800 KW tube power exhibited similar warp characteristics.

Metal Examination Facility, 105-C

Basin I, which includes viewing equipment and cartridge loading and handling equipment, was accepted with minor exceptions.

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Alignment of basin II equipment, which is for routine cleaning, weaseling, photographing, weighing, and measuring of jacketed slugs, should be completed in July. Operation of basins I, II, and III will probably begin in August, after operator training and extensive cold runs have been completed.

Excavation was started for the dejacketer permanent waste storage tanks.

Woodsplitter Expansion Project (IR-184)

The project is now about 99% complete. Station 2 has been balanced and tested. Station 1 is expected to be satisfactory (although it has not been tested) since it is similar to station 2. Station 3 will be tested and balanced approximately July 1, 1955.

TESTING METHODS

Ultrasonic Bond Test

The new prototype of the ultrasonic bond test which was built up on several chassis in the laboratory has been completed and assembled by the electronic shop. This unit includes some extensive changes as compared with previous prototypes, particularly in the receiver amplifier. As a result of these changes many more echoes are received from an unbonded area after receipt of the surface echo. This will permit greater time spacing between the opening of the selector gate and the surface echo, and therefore, reduce sensitivity to the position of the selector gate. Two calibrating circuits have also been built up, one of which was included in the new prototype. This is an ultrasonic dummy which presents a signal similar to that received from an unbonded slug, but of constant characteristics so that the gate position may be set with high precision. A second device to calibrate the count rate circuit has been made which will serve as a test instrument separate from the unbond test. The new prototype includes both a count rate and a counter readout, either of which may be selected to reject the slug.

Sonic Orientation Test

Breadboarding of the circuit for the sonic orientation test is about 50% complete and circuit design problems encountered are being worked out before the final design is submitted to the electronic shop for construction. Mechanical components for this test are about half designed and drafting work to complete this design is continuing.

Uranium Quality Test

This prototype equipment is now ready for installation in the 313 building, but installation has not yet been made because of construction work in the building. Considerable effort has been devoted to an evaluation test for the metal quality test device. As noted elsewhere in this report, it appears its sensitivity to certain types of defects is not satisfactory and additional metal quality testing devices will have to be developed.

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Pulsed Eddy Currents

Work on the pulsed eddy current technique this month has been devoted primarily to determining whether or not the use of a multiple frequency test signal affords a means to evaluate additional variables in test samples over those detected by the single frequency technique. Calculations are being made so that we can get a clear physical picture of the results to be expected under comparatively simple conditions.

Internal Friction

Using the nodal support arrangement as a means of making reproducible internal friction measurements, a series of room temperature measurements were made on slugs of varying grain size which resulted in a range of inverse Q of from 2 to 7 x 10^{-4}. This is lower by almost a factor of 10 than inverse Q determined at low frequencies with a torsional pendulum by others. It is believed that variation at high frequency as well as the difference between the high and low frequency results is due to grain size variations. An indication of the temperature dependence expected has been observed, but no measurements at other than the room temperature were made. Design is proceeding on a vacuum and induction heating device for high temperature work and necessary equipment has been ordered.

Mechanical Components

The tank, drive, and roll portion of the new automatic conveyor which have been under test were temporarily placed in service on the Al-Si penetration test. However, a serious vibration problem was encountered under the test conditions which has been traced down to a flexural vibration of the rolls. Emergency purchase requisitions were placed for stiffer rolls and it is expected that this will eliminate the vibration problem. The design of this automatic conveyor is now complete except for corrections of minor errors in the drawings.

Slug Can Examination

Using the original prototype of the Al-Si penetration test - operated at a much higher sensitivity than normal for this test - a relatively large number of empty cans have been examined. Although metallurgical examination is not complete, some can defects have been detected. It is not yet known, however, to what extent these are serious or to what extent the indications may be entirely spurious. Keeping this in mind, it is interesting to note the number of defects observed in samples of recent can shipments which were selected and provided by Process Sub-Section. This is shown in the table below. Continued evaluation of this problem will be made by Fuel Assembly Unit.

Shipment No.	% of Sample Giving a Positive Indication of Defects	Sample Size
1	100	
5	20	20
10	30	20
19	35	20
23	12.2	43
24	11.1	27
27	14.3	35

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Shipment No.	% of Sample Giving a Positive Indication of Defects	Sample Size
28	5.8	17
29	8	25
30	5.5	18
31	2.2	45
32	65	40

COATINGS AND CORROSION

Study of Corrosion Product Film

To study the nature of the corrosion products formed on aluminum, a thermocouple balance has been developed and constructed which will allow the automatic recording of weight changes of samples heated in a furnace. A flow trough is operating at 90 C and six autoclaves are under construction for use at 170 C to provide samples for this work.

Intergranular Corrosion

Intergranular corrosion has been demonstrated on production test slugs, and on some low exposure failures. Research is underway to determine the cause, mechanism, and rate of intergranular corrosion. Intergranular corrosion has been studied by metallographic techniques, by stiffness testing, and by bursting tests. It seems to be largely a function of temperature and of alloy composition and heat treatment.

Process Assistance

The nitric acid penetration is used to detect Al-Si penetration and to clean the surface prior to autoclaving. Replacing the 60% HNO_3 now used with 22% HNO_3 was found to reduce nitric acid losses without reducing the effectiveness of the test.

A centerless-ground, point-closure dummy slug was tested to determine surface quality. Impurities were found which led to pitting on corrosion testing. Hot pressed slugs were found to have some iron inclusions even after cleaning.

Some aluminum cans were sprayed with sodium hydroxide by Alcoa in an attempt to produce clean surfaces. On test here the surfaces were found to be very uniform and clean and free from inclusions.

A large number of slugs have been rejected at final inspection because of small black spots. One type of spot is a corrosion pit; another is an embedded particle, soluble in nitric acid, which must have been driven into the surface after the nitric acid penetration etch; the third is a rubbery or gummy black material.

High Temperature Corrosion Studies (aluminum in water)

The scouting studies to determine the resistance of commerical aluminum alloys to high temperature water is practically completed. More than 50 different alloys have been corrosion tested at 250 C, 305 C, and 350 C. The weight loss data (from corrosion product weight) for the better alloys at 350 C are shown in the following table.

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CORROSION RATE DATA FOR SOME ALUMINUM ALLOYS AT 350 C

Alloy	Time of Exposure	Corrosion Product - mils	Metal Loss mils/month
2S-1% Ni	23 days	1.5	0.5
18S	42	1.5	0.3
32S	42	3.5	2.0
A132	29	3.0	1.5
112F	29	3.0	1.4
333	29	2.0	1.3

Isolation of Corrosion Product Film

The corrosion product film formed on aluminum at high temperature is very difficult to remove by the usual stripping procedures. However, it may be conveniently isolated by dissolving away the aluminum metal from the oxide with a methyl alcohol-iodine solution. The film is then dried in an oven at 120 C and weighed. The weight of the corrosion product is subtracted from the post-exposure weight to give the weight of the remaining metal. The corrosion product is physically as well as chemically unaltered by the dissolution of the metal. Some very interesting aluminum oxide replicas of areas of intergranular attack, stringers in the metal, etc. are obtained by the procedure.

Aqueous Corrosion Resistance of Nickel Plated 2S-1% Ni

Aluminum alloys are being nickel plated in an effort to reduce the formation (in high temperature water) of a thick corrosion product film which inhibits heat transfer from slug to coolant. Some preliminary tests have been made to check the adherence and protection ability of various nickel plates on 2S-1% Ni alloy. A 64 hour test showed lowest weight gains occurred on the samples given a zincate undercoat. These samples showed weight gains substantially lower than unplated material.

Service Work

A diversified plating program was carried out with several materials plated as follows: hollow uranium cylinders electroplated with nickel; tungsten steel dies electroplated with chromium and with nickel followed by chromium; mild steel rods plated with chromium, nickel and silver; aluminum plated with nickel by electroless, electrolytic, and displacement nickel baths.

Plate Distribution

Previously the nickel plate deposited on solid eight-inch slugs was found to be so unevenly distributed that an average plate thickness of two mils was necessary to deposit a minimum of one mil. Redesign of the plating racks and the use of plastic shields have shown the feasibility of depositing a minimum of one mil while applying an average of 1.1 mils. Additional work is in progress to develop shields which will accomplish the same results on routine operations.

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Improvement of Electroplated Layers

Attention was directed principally to the improvement of the resistance of nickel electroplates in boiling water. Using uranium wafers subjected to a preliminary "medium" anodic etch, two different procedures were tried:

1. Elimination of flaws at contact points. A substantial improvement in the resistance of electrodeposited nickel to boiling water was effected by abrading the areas at and surrounding deliberately exaggerated contact marks, then immediately replating the abraded areas only. A one mil patched area was equal or superior in resistance to a one mil or two mil deposit covering the remainder of the wafer.

2. Sealing of porosity in the nickel deposit by flow of a metal of lower melting point. By interposing a layer of tin between two layers of nickel and heating the completely plated wafer to 230 C in an oil bath, the resistance of the electroplate was increased by a factor of 3 to 10 with respect to the resistance of an equivalent thickness of nickel when tested in boiling water. One specimen of the triple-plated wafers was resistant for 240 hours.

Electrodeposition of Nickel-Molybdenum Alloy

Conditions were established for the deposition of a nickel-molybdenum alloy of remarkable ductility. A wafer plated with approximately 0.2 mil of this alloy and one mil of nickel withstood boiling water for over 50 hours, in comparison with an equivalent one mil nickel deposit which fails in 8 to 24 hours, depending upon the condition of the contact points.

Secondary Corrosion Barriers of Nickel and Iron-Nickel

Out-of-pile evaluation of the secondary corrosion behavior of nickel and iron-nickel sweater coatings has been completed. The study was limited to nickel and iron-nickel coatings because these are the only ones which appear to have any value at present. A report giving complete details of this work has been issued.(1)

The nickel coatings were applied by electroplating, gas plating, or wrapping in nickel foil; the dual plates of iron plus nickel were electroplated. The coatings were tested in 170 C autoclaves and 120 C flow tubes for periods of 23 to 97 days and, with the exception of one iron-nickel coating and two nickel carbonyl coatings, showed no external effects. Metallographic examination has shown, however, that there are deposits of uranium hydride and/or uranium oxide under those areas of the sweater coating exposed to the hot water.

The following principal conclusions have been reached.(1) First, sweater coatings used in hot press assembly of slugs for future production tests should be only thick enough to prevent U-Al diffusion during hot pressing, since these out-of-pile tests have demonstrated that thicker coats do not provide sufficient corrosion protection to justify the additional reactivity loss. A thickness of

1. HW-37439, "Secondary Corrosion Behavior of Nickel and Iron-Nickel Coatings." E. A. Evans and H. C. Bowen, 6-22-55.

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0.5 mil, and possible less, is sufficient as the diffusion barrier. Second, efforts to develop gas plated or mechanically fabricated sweater coatings of nickel or iron should be dropped because these coatings can be applied on a large scale more easily, uniformly, and inexpensively by electroplating than by either of the other two methods, and the electroplated coatings are just as satisfactory from a corrosion standpoint. Third, an in-pile test of one or more partially stripped slugs would be desirable before completely dismissing the possibility of secondary corrosion protection.

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PHYSICS RESEARCH SUB-SECTION

Reactor Physics

Work was done on reactivity data from H-Pile. These data were accumulated during a period when the average exposure decreased from 512 to 234 MWD/T. From these data one concludes that the graphite temperature coefficient dropped from 1.72 to 1.31 inhours per °C maximum graphite temperature in a lattice cell. Therefore, there is a change in the coefficient of $\frac{0.41}{278} = 1.5 \times 10^{-3}$ ih/°C/MWD/T local exposure.

In a treatment that is alternative to G. W. Stuart's, that portion of the reactivity temperature dependence which is due to a shift in characteristic temperature for neutrons in Maxwellian equilibrium with the moderator has been calculated in a quasi-diffusion approximation for the dry K-W lattice. The model assumes that the moderator flux and the current entering the fuel rod (though not the emergent current) are Maxwellian and that fuel rod absorptions are correctly described by energy-dependent blacknesses. A reactivity curve has been computed for that uniform pile temperature case in which the reactor geometric buckling is held constant. In the course of the temperature dependence analysis, heterogeneous reactor thermal utilizations and thermal leakages were shown to be slightly more dependent than they are usuall considered to be on the reactor geometric buckling, and an expression was derived for the flux drop between graphite and slug surface, for a dry fuel rod assembly.

The study considering new slug types designed to irradiate depleted uranium (0.3% - 25) in the existing reactors has been completed. Two designs are considered: i) the wrap-around slug in which an enriched uranium layer is deposited on a solid depleted uranium core, and ii) a matrix of magnesium 25 alloy holding depleted uranium pellets.

The wrap-around slug may be constructed by bonding a layer of Oralloy (94% 25) 0.00272 cm thick onto a solid depleted (0.3% 25) core 1.70 cm in radius. In this design there is 0.516 gm 25 per cm of slug length in the film and 0.515 gm 25 per cm of slug length in the core. The sum of these, 1.031 gm 25 per cm, is to be compared with the 1.236 gm 25 per cm present in natural uranium. The conversion ratio for this fuel element will be approximately 1% less than that for a natural uranium element.

If serious metallurgical difficulties are encountered in fabricating the thin Oralloy layer, an alternate wrap-around design would employ J-like (Al, U-235 alloy) material, 25% by weight U-235, having a thickness of 0.061 cm. In the transition from the Oralloy to the J-like fuel element, changes in the conversion ratio and the required 25 inventory will be small (approximately 1% in each).

The other design considered is the pebble-matrix slug.* Assuming the most favorable situation, 70% of the slug volume will be depleted (0.3% 25) pebbles and 30% will be magnesium-25 alloy. The alloy will contain 0.610 gm 25 per cm of length while the pellets will contain 0.365 gm 25 per cm of length resulting in a total 0.975 gm 25 per cm of slug length. The conversion ratio of this element will be 12% less than that of a solid, natural uranium piece.

All of the above designs match natural uranium in reactivity.

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* The work of M. V. Davis reported in HW-33918 has been useful in the design of this slug.

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Physics Research Sub-Section

The assembly of the Lattice Test Reactor has progressed satisfactorily during the month. Start-up plans have been worked out in detail and reviewed with members of the Manufacturing (S. L. Sterling), Advance Engineering (P. F. Gast), and Pile Engineering (R. L. Dickeman) organizations.

Work continues on the development of a furnace to heat the PCTR core. Present plans are to use vacuum insulation. Tests are being conducted to see if it will be possible to pump down a single-walled vacuum vessel containing hot graphite. The goal pressure is one micron.

The design of the control and safety circuits for the Thermal Test Reactor has been completed. Fabrication of components for TTR has been delayed by the higher priority given to PCTR work.

Measurements of the buckling (B) of the wet and dry 6-3/16" lattice loaded with J slugs were made. The values obtained: B(wet) = 1335 ± 20 x 10^{-6} cm^{-2} and B(dry) = 1225 ± 20 x 10^{-6} cm^{-2}, agree very well with the values one would obtain by interpolation of the data presented in the Exponential Experiment paper prepared for the Geneva meeting.

An investigation of the unexpectedly high natural background existing in these U-235 lattices has indicated that it can be almost entirely attributed to the U-234 content (about 1% of the total uranium) of these slugs. The α-particles from U-234 decay give rise to an Al(α,n) reaction which furnishes 200-300 times as many neutrons as does the spontaneous fission of the various uranium isotopes in the slugs.

Work is going forward on the preparation of facilities to heat lattices to elevated temperatures. Neutron counters which will function at these temperatures are being developed.

Nuclear Physics

The experimental measurement of η has been completed on the neutron spectrometer. From the data, it appears that η is constant in the range 0.025 to 0.1 ev and decreases by about six per cent in going from 0.1 ev to 0.3 ev.

Physics Problems Connected with Plant Operation

Experiments recently performed at Rocky Flats have shown the sub-criticality of various arrays of Hanford sample cans containing from 300 to 350 gms plutonium per can. A nuclear safety review of the handling and storage procedures for sample cans containing up to 400 gms plutonium has been made in the light of this new evidence; as a result, it has been determined that a close-packed one-layer array of such cans is safe against chain-reaction under all circumstances with the possible exception of introducing an optimum amount of hydrogenous material into the interior of the array. This is reported in a letter to the AEC, HW-37157; a further letter, indicating that it would be safe to load two cans into each cubicle of the AEC transportation facility, is being prepared.

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Physics Research Sub-Section

A comprehensive survey of nuclear safety problems involved in the operation of the Purex plant has been made in collaboration with personnel of the Separations Technology Section. The results of this survey will be reflected in the nuclear safety specifications which are being prepared by Separations Technology personnel.

Physics Research provided nuclear safety consulting service in connection with a problem of contact maintenance in the 233-S Building of the Redox plant, and participated in a conference to consider the possibility of increasing batch size in T-plant. Several problems connected with the operation of Hood 5, Task I, 234-5 Building were also investigated.

A very preliminary study of the facility necessary to carry out critical mass measurements on water-plutonium systems has been undertaken. The building presently anticipated would have about 18,000 square feet of floor space plus 4500 square feet of basement for an air conditioning room. Minimum costs for this type of a building would be $\$50/ft^2$ and maximum (based on 325 Building) should be $\$80/ft^2$. The large size of the resulting number for the cost, \$1 to \$1.5 million, has already forced consideration of an economy model which would run about 14,000 ft^2. The two shielded reactor rooms, which are each 40-feet square and 30-feet high, considered as two floors account for nearly 8000 ft^2 including shielding. The control rooms and solution storage and mixing rooms amount to about 3000 ft^2 more. The remainder is in change rooms, hot and cold component storage, instrument shop, chemical laboratory, counting room, lunch room, and office space.

Irradiation Physics

The study of the general problem of damage to the uranium lattice by fission fragments is continuing. In particular, a better estimate of the number of displacements produced by a fission fragment is being made, in an effort to reconcile some of the significantly different values appearing in the literature. This calculation is being carried out using an integral equation set up analogously to that used by Snyder and Neufeld, PR 97, 1636 (1955). The assumptions as to interaction potentials between atoms are being examined, to see if the advantages to be expected using improved potentials are sufficient to outweigh the accompanying mathematical complications.

Consultation has been given to members of Physical Metallurgy on theoretical aspects of the problem of determining the displacement energy of uranium, using electron bombardment from the Van der Graaff generator.

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METALLURGY RESEARCH SUB-SECTION

Fundamental Studies

The study of the effects of irradiation on the dimensional stability of preferentially oriented uranium has continued. The remaining four assemblies of the production test PT-105-514-SI, have been opened and the eighteen cylindrical specimens measured and visually inspected. As in the case of the previously opened samples, the specimens which possessed a lone (020) or b axis type of orientation increased in length and decreased in diameter. A duplex (020, (110) type of orientation resulted in stability only when the (110) orientation was predominant. Randomly oriented samples were also found to remain stable during the irradiation. Assembly number 2, which contained samples with a high (020) preferred orientation, had ruptured during irradiation. This failure was a combination split and end failure. The bottom of the aluminum can was badly bulged and partially separated from the can wall. In addition, two longitudinal splits, 180 degrees apart, extended approximately two inches from the damaged end of the can. Examination of the contents of this assembly disclosed that the uranium samples had elongated to such an extent that they were restricted by the end of the can. The resultant forces were sufficient to cause the rupture. Eight of the specimens from this test were given density measurements. The densities varied from 18.78 at 300 MWD/T to 17.41 at 1150 MWD/T with intermediate and higher densities at intermediate exposures.

Experiments have been conducted to study the effect of various quenching rates on the formation of large columnar grains that occur when uranium slugs are cooled from the alpha, beta, and gamma phases. Formation of large columnar grains aligned parallel to the direction of heat flow was observed in all cases when the slugs were uniformly heated to 860 C and quenched by immersion of 1/4 inch of one end of the slug in agitated ice water. Cooling rates up to 400 C per minute have been investigated. Only minor surface reactions have been observed between the hot uranium and water.

Two U/Al and one U/AlSi diffusion capsules containing two diffusion couples each are now being irradiated in the MTR for a period of one cycle (approximately 18 days). The fluxes requested for the three capsules were 4×10^{13}, 5×10^{13}, and 4×10^{13} nv, respectively; these fluxes should produce maximum temperatures of 200 C (392 F) and 250 C (482 F) at the diffusion interfaces in the first and second U/Al capsules and 200 C (392 F) at the diffusion interfaces in the U/AlSi capsule. Laboratory studies have continued in order to develop a basis for interpretation of the results of the in-pile diffusion experiments. Two U/Al couples have been vacuum annealed at 200 C (392 F) and one at 250 C (482 F) for a period of approximately 317 hours. Maximum penetration was 4.3 mils into the Al for the 200 C (392 F) couples and 9.3 mils for the 250 C (482 F) couples. Three U/AlSi diffusion couples have been vacuum annealed; two at 200 C (392 F) and one at 250 C (482 F). None of the AlSi specimens adhered to the uranium, but small mounds approximately 0.2 to 0.7 mils high were found projecting from the uranium interface, and corresponding holes were found in the AlSi. The couples are now being analyzed by metallographic and x-ray diffraction methods in order to determine whether the mounds on the uranium are diffusion products, and if so, whether they represent the total extent of diffusion of uranium into the AlSi.

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Metallurgy Research Sub-Section

Some alloys of uranium are being studied to determine whether irradiation produces dimensional changes in isotropic modifications of uranium. The epsilon phase (body-centered tetragonal) of the uranium-silicon system, having the composition U_3Si is formed below 930 C (1705 F) by peritectoid reaction of gamma uranium and U_3Si_2. Present work is intended to demonstrate whether thermal expansion is an effective criterion for determining the amount of epsilon phase present in a given specimen. No significant difference in thermal expansion was found between a specimen after heating at 800 C (1470 F) for several days to promote the formation of epsilon (the as-received condition) and after heating above the peritectoid temperature to 995 C (1750 F) for one hour to decompose the epsilon phase. Metallographic examination of these specimens has not been completed yet.

An irradiation of straight and tapered powder metallurgy uranium rods has been conducted to determine the accuracy of heat transfer calculations and the effect of in-pile transformation from the alpha and beta phase on the centers of uranium fuel elements. One tapered, cylindrical specimen, which had operated at a calculated temperature of 900 C at the small end to 50 C at the base, was lapped and hardness measurements obtained. The hardness decreased uniformly from approximately 99 Rockwell G scale at the base (50 C) end to 94 approximately 1/2 inch from the rod tip. The calculated temperature 1/2-inch from the tip was approximately 800 C. A more rapid decrease in hardness, 94 to 89 Rockwell G scale, was observed over the remaining 1/2 inch of the rod at the tip end. Pre-irradiation hardness of the uranium rod was 85-87 Rockwell G scale.

Reactor Structural Materials

The effect of irradiation on 50 percent cold-worked Zircaloy-2 precharged with 100 ppm hydrogen was studied by comparing the impact energy absorption of irradiated specimens with that of unirradiated specimens as a function of impact testing temperature. On the basis of this test, it appears that Zircaloy-2 specimens containing 20 ppm H_2 when irradiated to 64 MWD/AT in recirculating water at 146 C (295 F) have Charpy "V" notch impact energies essentially the same as those measured in the control specimens exposed downstream of the active charge to 0 MWD/AT at 190 C (375 F). The irradiated specimens containing 100 parts per million of hydrogen added before exposure broke at lower impact energies at the same temperatures than did identical control specimens exposed downstream out of the pile flux. Below an impact testing temperature of 175 C (347 F) the irradiated specimens containing 100 ppm of hydrogen broke at from 5 to 10 ft lbs, and the unirradiated broke at 6 to 11 ft lbs. Transition occurred at about 230 C (446 F) in the irradiated and at about 200 C (392 F) in the unirradiated, based on a criterion of one-half the sum of maximum and minimum impact energies. These data indicate that addition of hydrogen to cold-worked Zircaloy-2 either accelerates the pickup of additional hydrogen during irradiation in pressurized water, or the addition of the hydrogen makes Zircaloy-2 more susceptible to irradiation embrittlement from sources other than hydrogen.

A joint program with BMI on the effect of ionized gases on Zircaloy-2 gas reaction rates and mechanical properties was concluded. Conditions of the test were as follows:

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Degree of cold work	65% and annealed
Atmosphere	10% air 90% He
	80% CO_2 20% He
	Both mixtures ionized and nonionized
Reaction Time	0 to 16-3/4 hours
Reaction Temperature	500 C (932 F).

Conclusions that can be made from the test results are: (1) reaction rates observed for the cold-worked material are essentially the same as those for the annealed material; (2) the slope of the curve showing log weight gain versus log time was found to be 0.40 for the initial reaction of Zircaloy-2 with dry air. This value is in good agreement with the slope of 0.41 observed at BMI for the reaction of Zircaloy-2 with both the ionized and nonionized air mixtures listed. (3) The slope of the log plot of the reaction with ionized carbon dioxide was 0.26, but for the reaction with nonionized carbon dioxide the slope was nearly linear (0.9). The reaction rate constants were such that after 10 hours' exposure the weight gain in ionized carbon dioxide was ten times greater than in the nonionized carbon dioxide. The curves for ionized and nonionized carbon dioxide extrapolated to an identical weight gain at about 200 hours' exposure.

Notch slow-bend tests were made on the gas reaction specimens having a 0.008-inch deep notch and a 0.001-inch root radius. Oxide on the top of the specimens was fractured during the notching, but oxide (or scale) on the side opposite the notch was undisturbed. Conclusions from the bend test results are: (1) The initial bend ductility (fracture angle) of the 65 percent cold-worked material is 25 percent of that of the annealed material. After heat treatment for 9-1/2 to 16-3/9 hours in any of the four atmospheres at 500 C (932 F), the bend ductility of the cold-worked material is better than that of the annealed Zircaloy-2. (2) The bend ductility appears to depend more on the amount of reaction (weight gain) than on the type of gas or ionization state of the gas. (3) The fracture strength of all the cold-worked specimens was consistently higher than that of the annealed specimens. Under the conditions of this experiment the cold-worked specimens are in a tougher condition than the annealed specimens since both the fracture angle and the fracture moment of the cold-worked material exceeded that of the annealed material at the end of the gas reaction periods. (4) Ionization affects the bend properties only to the extent that it changes weight gain. Specimens reacted with ionized gas have the same bend properties as those reacted with nonionized gases when the comparison is made on a basis of equivalent weight gain.

Fuel Materials

Preliminary experiments have shown that an appreciable increase in densification rate of UO_2 during uranium sintering is obtained by introduction of small amounts of calcium hydride into the green compact. The hydrogen and free calcium resulting from thermal decomposition of CaH_2 provides a reducing atmosphere throughout the body of the sintering piece. The introduction of calcium oxide into the UO_2 lattice causes a metal-rich defect structure which increases rates of mass transport. A density of 8.64 gm cm^{-3} was obtained with UO_2 containing originally 1.65 wt percent CaH_2 under conditions of sintering which normally produced a density of 7.97 gm cm^{-3} in pure UO_2. Sintering temperatures are approximately 1800 C.

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Reductions of uranium oxides on a small scale, 30 to 300 grams, are being studied. It appears a more accurate evaluation of this reduction reaction used in the preparation of particulate metal for the U-Mg matrix fuel element can be obtained on larger scale reductions. Equipment for scale-up to 4000 g charges is now being assembled. Reductions of both UO_3 and UO_2 with calcium will be run on the larger scale. Experiments have been performed designed to form massive pellets directly by reduction of uranium oxides with calcium in open pots under argon. The best reduction to date yielded pellets ranging from 1/32" diameter to fine powder in 37 percent yield. By holding the temperature higher and longer, yields have been increased to 85 percent, but the metal particle size has gone down until the metal is a spongy mass of very fine spheres. More experiments are planned to determine if increases in yield and particle size can be produced by this reduction process.

Experiments designed to determine the role of CaO in preventing coalescence of uranium metal have continued. As a result of the experiments, a new technique has been discovered for melting small pieces of uranium which should be very useful for recovery of scrap uranium and for recovery of metal dendrites on the cathodes of low temperature electrolytic runs. The metal to be melted need not be pickled but only degreased. Detergent and water have worked adequately for the degreasing step. MgO crucibles have been employed. The MgO crucibles are satisfactory up to a temperature of about 1375 C. At or above this temperature uranium will reduce MgO to free magnesium. Four conditions are necessary for a successful melt: (1) Metal scrap is degreased. (2) Calcium metal is added to the crucible in an amount sufficient to react with any uranium oxide present plus an excess of about 10 to 20 percent. (3) Solvent flux, generally $BaCl_2$ or $CaCl_2$ is sprinkled over the metal and calcium in sufficient quantity to completely dissolve any CaO present from the reduction step. For CaO in $BaCl_2$ at 1300 C this is probably less than 25 mol percent. The actual value has not been established. (4) The mix is brought to a temperature of 1300 C ± 50 C in an inert atmosphere. The atmosphere employed has been argon which has been passed over zirconium metal at a temperature of 900 C. The last step has been found to be very important since oxygen is soluble enough in $BaCl_2$ flux to completely oxidize turnings in a few minutes and thus prevent their flowing together. Any agitation which can be introduced will speed up the solution process and is a definite help. The resulting melt is sound and clean based on experimental laboratory results.

Sixteen Zircaloy capsules containing compacted UO_2 fuel material were discharged from the MTR during this report period. Exposure on the samples range from 100 to 1000 MWD/T. The maximum temperature attained by this fuel material during irradiation was approximately 2800 C. The specimens are being returned to HAPO for post-irradiation examination.

The irradiation of two capsule specimens of a uranium-magnesium matrix material is continuing at the MTR. Present exposure of the test pieces is approximately 16,000 MWD/T. The specimens are scheduled for irradiation to a 20,000 MWD/T exposure level.

A piece of UO_2 of Hanford four-inch slug geometry and 86 percent theoretical density has been jacketed in Zircaloy-2 and submitted for exposure to 280 C recirculating deionized water in the Elmo-4 loop. The jacket contains an intentional defect consisting of a 0.025" diameter hole. At the date of this writing the assembly has been exposed 54 hours to 260 C water with no apparent change in the fuel element.

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Metallurgy Research Sub-Section

The high pressure loop fabricated by Byron-Jackson Company of Los Angeles has been received on site. Initial work with this loop will study the reaction between water at 250-300 C and fuel materials at 500-700 C. Wiring of the control panel and initial cold hydrostatic tests of the loop will be completed in June, and initial high temperature experiments will begin in July.

Fuel Element Evaluation

The thermal stresses within a fuel element are a function of the temperature, time, and irradiation dependence of strength properties of the uranium. Previously, two documents were written which described a method of determining temperature and time dependent effects. The form of the model for material behavior was based on experiments conducted on aluminum and steel and had to be checked for uranium. A series of creep tests was needed to obtain the desired relations necessary for a solution by this method. These data have been obtained and an analysis of creep tests conducted by BMI indicates that the assumed model for material behavior will not hold for uranium over the desired temperature range of 100 C to 500 C. To evaluate the model of material behavior, the following relation between the plastic strain, E_p, and the time, t, for various creep tests was assumed: $E_p = C\,t^b$, where C is a function of stress and temperature, and b is constant. The b for the 100 C and 250 C or the 400 C and 500 C creep tests is approximately constant, but a definite change in b exists between the 250 C and 400 C creep tests. The variation of b over the range between 250 C and 400 C may be due to the activation of new active slip planes or mechanisms in this temperature range. The model for material behavior must be extended to include the additional observed phenomena before the time relations of thermal stresses can be calculated. This extension will be difficult because it must cover a transition period of material behavior. The understanding of the mechanisms of creep behavior in the 250 C to 400 C range may help explain the observations of dimensional stability at 500 C.

Unbonded slugs, canned by the room temperature point closure technique, have been irradiated to determine their rupture resistance and to check the hypothesis that an unbonded fuel element should give improved performance under Hanford conditions. Under PT-105-580-A the following irradiations of solid unbonded slugs have been completed.

No. of Pieces	Specific Power	Exposure (MWD/T)
1	47 kw/ft	280
1	9 kw/ft	56
2	38 kw/ft	490
4	42 kw/ft	1015

These slugs, as viewed in the basin, showed no evidence of preferential corrosion at the closure or of burned spots. The four slugs irradiated to 1015 MWD/T are scheduled for examination by Radiometallurgy Unit personnel.

Two cored insulated slugs are being irradiated at the MTR; one having the cored uranium plugged with welded uranium end plugs and one having a uniform core without end plugs. Each slug contains zirconium disks at each end of the uranium, and in the case of the open uranium cylinder the zirconium disks served to prevent

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flow of aluminum into the core during the canning process. The slugs are operating at 57 kw/ft fission heating and 8 kw/ft gamma heating. Calculated operating temperatures for these slugs at this specific power are 380 C uranium surface temperature and 790 C maximum uranium temperature. The slugs will have accumulated about 275 MWD/T exposure at the end of the month. They have been measured twice during the irradiation with the following results:

	Diameter After Indicated Exposure			Length After Indicated Exposure	
Slug No.	0 MWD/T	90 MWD/T	200 MWD/T	0 MWD/T	200 MWD/T
ARM-17	1.440"	1.454" 1.457 1.457	1.455" 1.456 1.457	4.831"	4.863"
MR-3 (no end plug)	1.438	1.455 1.456 1.458	1.455 1.455 1.456	4.841	4.898

It seems probable that the initial increase of about one percent in the length and diameter of the canned fuel elements arises from thermal expansion of the uranium. The absence of further expansion upon additional irradiation appears to bear out this conclusion. The slugs will be irradiated to about 650 MWD/T before they are measured again. Goal exposure presently planned is 800 MWD/T.

Radiometallurgy Examination

Examination of low exposure production slug failures was continued on two slugs from 100-H. One was typical of the current failures, and the other was an unruptured slug thought to have been affected by the initial stages of the process causing failure. A metallographic study of several transverse sections from the rupture revealed no abnormalities in metal quality or exposure effects and that the condition of the AlSi braze and compound layers conformed to the normal fabrication quality. The metallography and chemical analysis of the can conformed to the specifications for 2S aluminum. However, in a study of the corrosion effects on the can wall it was observed that the aluminum had severe intergranular corrosion attack in the portions of the can that had apparently not been adequately cooled during pile exposure. This corrosive attack was general throughout the "hottest" area of the slug surface and was most advanced in the area of actual rupture. Other isolated spots were found where the intergranular attack had penetrated half the can wall thickness. The intergranular corrosion was not found on the portions of the slug where cooling had apparently been normal. It is felt that diminution of the coolant flow over a portion of the slug surface had resulted in surface temperatures high enough to promote the intergranular attacks which eventually penetrated the can.

The unruptured slug also had surface scale formation indicative of uneven cooling. Metallographic examination showed the intergranular corrosive attack in the hotter portion of the jacket. Intergranular corrosion has not been observed on other, previously examined, cocked, bored, or ruptured slug jackets.

The examination of three cored, AlSi-bonded, natural uranium slugs from PT-105-570A was completed. The longitudinal splits which had developed in the two unruptured slugs accompanied a deformation of the uranium which caused a diameter increase in one direction with a very slight decrease in the diameter perpendicular to this

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direction. The slug ends, containing the plugs welded in place, had undergone the minimum deformation. A few micro cracks were found, but nothing to indicate the start of fragmentation such as occurred on the rupture.

Examination of the unbonded, point closure failure from tube 2061-C and two unruptured pieces from the same tube was begun. This tube was irradiated under PT-105-584A to an exposure of 483 MWD/T. The jacket of the rupture was severely swollen at the cap end by the formation of uranium corrosion products. Both the cap and base were nearly detached from the slug by extensive circumferential tears in the jacket, which resulted from the formation of large quantities of uranium corrosion product at both ends. Appreciable necking down was associated with the tear at the base but very little was noted at the cap end. Several longitudinal cracks were found in the swollen area of the jacket, all of which formed with very little plastic deformation. Sectioning of the slug approximately 1-1/2 inches from the cap end revealed no macro cracks in the uranium core. Examination of the two unruptured pieces revealed relatively large areas on the jacket surfaces which appeared to be "wrinkled". These areas were located between the base and center of the slug in both cases. The mechanism involved in the formation of these "wrinkles" is not known; however, it appears that they were formed in the pile since they were not observed before or after autoclaving.

Three additional slug jacket samples from the unbonded "C" Process failure from tube 2686-C were submitted for spectrochemical analysis because of the high silicon contents (4.3 - 10.4 percent) previously found by chemical analysis. None of these samples showed abnormally high silicon contents, thus confirming the results of an earlier spectrochemical analysis of several samples taken from this failure and contradicting the unexplained wet chemistry results.

Separations Plant Structural Materials

Further progress has been made in the program to determine the corrosivity of boiling synthetic 2WW Purex waste acid concentrate under heat-transfer conditions upon wrought and cast types 304L, 347, and 312 stainless steel and wrought type A-55 titanium. The effect of time upon the corrosion rate of wrought type 312 stainless steel heat-transfer specimens has been investigated at an average specimen temperature of 145 C. The results of this study show that the corrosion rate of wrought type 312 stainless steel increases from an average of 0.0012 inch penetration per month at 64 hours' exposure to a steady state corrosion rate of about 0.0028 inch penetration per month between 1024 and 2048 hours' exposure.

Static and heat-transfer corrosion tests have been performed upon wrought and cast types 304L, 347, and 312 stainless steels and wrought type A-55 titanium in typical Redox H-4, F-2, and D-14 solutions. These corrosion tests constituted a preliminary survey of the behavior of these candidate construction materials in the F-2 and D-14 solutions, and completed a series of corrosion tests of H-4 oxidizer solutions. The corrosion rate of the wrought type A-55 titanium was in all cases less than 0.0004 inch penetration per month. This is a factor of two less than the lowest corrosion rate obtained for either of the three types of stainless steels.

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Metallurgy Research Sub-Section

Two field corrosion exposure units have been installed, one in a Redox underground waste storage tank, 107 SX, and the other in a Purex underground waste storage tank, TK 101-241A. The units are designed to obtain long term corrosion data on SAE 1020 carbon steel, Cor-Ten, and Mayari-R; two low alloy-high strength steels, and Carilloy T-1, an alloy steel, exposed to neutralized process wastes. Samples will be removed from the exposure units at intervals of 4, 8, 16, 32, 64, and 128 months.

Welding Development

The weldability of three low alloy steels - Corten, Mayari-R, and Yoloy - and one alloy steel, T-1, has been evaluated by determining the tensile properties of welds deposited on the above steels using low hydrogen, iron powder coated electrodes. The results of these tests indicate that (1) the four steels tested can be welded satisfactorily without the benefit of preheat or postheat treatments, and (2) none of the steels tested appear to be "notch sensitive".

Time and motion studies have been conducted to determine the relative fabrication time necessary to butt weld pipe using three different weld joint designs - the conventional beveled joint, the EB consumable insert joint, and a new joint developed in the GE welding laboratory. A form cutting tool has been developed to produce the "GE" joint which reduces the time required to prepare the pipe for this joint. Using the form cutting tool, the conventional beveled joint and the "GE" joint can be made a great deal faster than the EB consumable insert joint. The later joint requires excessive joint preparation and fit-up while the "GE" joint can be produced with the greatest ease and reproducibility.

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CONTACT ENGINEERING UNIT

PROJECT ACTIVITIES

Project C-431-A

The replacement horizontal rods for C Pile have been received and are scheduled for installation after completion of the CG-558 rod installations.

Project CG-558

As of June 24, it was estimated that 84% of the Engineered materials and equipment had been requisitioned and that total construction was 11% complete. Contracts were awarded for the 190-DR Annex to the same contractor that is building the 190 B & D Annexes. At month end the 100-D Pile was shut down for H-rod replacement. Modifications have been made to the bearing assemblies in the step plug to prevent rod scratching which caused much concern at DR.

Projects CG-578 and 579 (Gamma Monitoring)

All pre-shutdown work has been completed at DR and H Areas. Turret installation is under way at the other piles.

Project CG-600 (CG-558 at C Pile)

As of June 30, the revised proposal for this project had not yet received complete approval. Manufacturing Department was reviewing the justification section of the proposal.

Zone Temperature Monitoring

Project representatives have been appointed to handle the scoping of this project. The first meeting of this group was held on June 28. The exact number of points has not yet been established. It was recommended by the group that the sensing element have as short a response time as possible and still be mechanically adequate.

PROCESS AND SPECIAL STUDIES

The final draft of the report on the economic aspects of pile pressurization has been read and approved. It is anticipated that the report will be issued during the coming month. Work on the incremental production cost study was confined to the accumulation of additional details of present and projected operating costs.

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Contact Engineering Unit

The final draft of HW-36714, "Record of Removal of Contents of Process Channel 4669 KW" was issued.

Assistance was rendered the Pennsylvania Power and Light Nuclear Power Study Group during its visit on June 7 and 8.

PILE TECHNOLOGY SECTION

INVENTIONS

All Pile Technology Section personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during June, 1955, except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

Inventor	Title
W. J. Bailey	Double-Acting Hot Work Punch
W. J. Bailey	Single Stroke Hot Work Punch
W. R. DeHollander	A Description of an Improved Method of Melting Small Uranium Scrap (Report not yet issued)

O. H. Greager

Manager - Pile Technology
ENGINEERING DEPARTMENT

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VISITORS AND BUSINESS TRIPS

W. M. Campbell, L. G. Cook, E. J. Evans, J. A. Morrison and R. J. Sage of A.E.C.L., Chalk River, Canada visited Hanford 6-13 through 6-14-55 to discuss waste treatment problems.

John G. Lewis, Engineering Research Institute, Univ. of Michigan, Ann Arbor, Michigan visited Hanford 6-23 through 6-24-55 to discuss waste disposal scavenging.

D. H. Stewart, Dow Chemical Co., Midland, Michigan visited Hanford 6-23 through 6-24-55 to discuss waste disposal scavenging.

E. M. Kinderman of Hanford visited KAPL, Schenectady, N. Y. 6-6 through 6-8-55 for "Bluenose" discussions.

F. J. Leitz, R. L. Moore, A. S. Wilson and C. E. Michelson of Hanford visited Eugene,Oregon 6-10 through 6-11-55 to attend the meeting of the American Chemical Society.

H. T. Hahn and M. T. Walling of Hanford visited New Hampton, New Hampshire on 6-13 through 6-17-55 to attend the Gordon Research Conference.

H. T. Hahn of Hanford visited KAPL, Schenectady on 6-20-55 through 6-21-55 to discuss separations processes.

M. T. Walling of Hanford visited the Vitro Corporation, New York City, N. Y. on 6-22-55 to discuss problems relating to reprocessing of spent power reactor fuels.

L. J. Lucas of Hanford visited the Fairchild Engine Division, Farmdale, N. Y. on 6-12 through 6-13-55 and the Carrier Corp. Syracuse, N. Y. on 6-14-55 through 6-15-55 to inspect surplus machine tool equipment.

J. J. Shefcik of Hanford visited the ANP project Lockland, Ohio on 6-7-55 for interview and discussions on reactor materials.

ORGANIZATION AND PERSONNEL

	May	June
Separations Technology General	2	2
Plant Processes Sub-Section	57	57
Chemical Development Sub-Section	77	78
Chemical Research Sub-Section	60	61
Contact Engineering Unit	5	6
Analytical Labs. Unit	34	34
Technical Shops Unit	30	30
	265	268

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PLANT PROCESSES SUB-SECTION, C. F. HILL

REDOX PROCESS TECHNOLOGY

Feed Preparation

Metal charged to the dissolvers averaged 862 MWD/T (782 to 1042) pile exposure, and 103 days (86 to 115) cooling time. Mercury has not been used in the dissolving step because of the generally extended cooling time of the metal charges and the good control of iodine emissions. Charging irradiated metal into dissolvers containing sodium nitrate at 60 C has continued without incident, although no good waste loss data are available to date.

The dissolving procedure remained unchanged on all first cuts. Since June 7, however, all second cuts were dissolved with a modified procedure, in an attempt to reduce radioiodine emissions. In this procedure, the initial charge of acid to the dissolver is 4400 pounds of 41 per cent nitric acid (vice 7400 pounds of 49 per cent) with the remaining acid (60 per cent) being added at 30 pounds per minute after bringing the solution to a boil and digesting at boiling for 30 minutes. Time cycles were essentially unchanged by the new procedure, while iodine emissions were reduced.

Metal charges to the dissolvers were increased from five to six tons since June 22, in an attempt to increase dissolver capacity. The dissolving procedures for these larger cuts are being varied at report time to determine the optimum time cycle. Operation to date has been satisfactory. Preliminary estimates indicate a capacity increase of approximately one ton per day is effected by the change.

Essentially all of the Head-End batches were treated with 0.02 and 0.01 M $KMnO_4$ in the sacrificial "kill" and oxidation steps, respectively, followed by complete MnO_2 dissolution. Three IAF batches received one hour oxidation (vice two hours) on June 8 and 9, with no effect on radio-ruthenium content in the two product streams. This change will allow a Head-End capacity increase of approximately 1.5 tons per day. No rework of waste through Head-End was done during the month.

Solvent Extraction Performance

Uranium recovery has been good throughout the report period, averaging 99.6 per cent. Plutonium recovery has been good except in the 2A Column where performance has continued erratic in spite of the changes made last month. To further aid in plutonium recovery, the salting strength in the 2AF was raised by increasing the IBX salting strength to 1.5 M $Al(NO_3)_3$ on May 28. Maximum waste losses were reduced from 1.5 per cent to 0.11 per cent. The over-all recovery for the report period averaged 99.3 per cent.

A building shutdown from June 13 to June 25, due to a lack of sufficiently cooled pile metal, permitted extensive flushing of the columns and associated tanks. All columns except the IC, 2E, 3E, and IO were flushed with water, steamed, flushed with hot 60 per cent nitric acid, and water. An additional flush of five per cent caustic - 1.5 per cent hydrogen peroxide was given to the IA

and IS Columns and an additional flush of 15 per cent nitric acid - 1.5 per cent hydrogen peroxide was given to the 2A Column. These flushes were made to improve capacity, decontamination, and recovery.

Decontamination

Decontamination for both uranium and plutonium has been excellent during the month. The following data are typical of the month's operation:

Cycle	Gamma Decontamination Factors, dF	
	Uranium	Plutonium
Head-End and First	4.2	3.9
Second	2.4	2.5
Third	0.6	1.3
Over-all	7.2	7.7

The 2D Column interface was lowered stepwise to a position five feet below the feed tee for 30 hours; hence, the entire scrub section, feed point, and five feet of the extraction section were continuous organic phase. This mode of operation had no significant effect on 2D Column decontamination or waste losses. The 2D Column interface has been returned to its normal position in the scrub section.

Flowsheet

During the report period, the IBX aluminum nitrate concentration was changed from 1.3 to 1.5 M to increase the 2AF aluminum nitrate concentration from 1.16 to 1.3 M. The dilute 2AF had been the result of the abnormally high sodium dichromate and nitric acid butts to the IBP solution and the additional jet dilution from the 2AF Sampler Tank to the 2AF Feed Tank. The IBP sodium dichromate butt was reduced from 0.04 to 0.024 M without detectable effect on the 2A Column waste losses. No other flowsheet changes were made in either the Plutonium or Uranium Cycles.

Plutonium Concentration Building

The operation of the 233-S Building was plagued after June 10 with plugging problems. A rusty brown slime and granular material, later found to be primarily silica with small amounts of plutonium, iron, chromium, nickel, and aluminum, was found to be the primary cause of the problem. The sludge is probably a residue from sand or dirt left in the equipment and lines prior to startup, or from coagulation of impurities present in the 3BP solution and corrosion products from the 233 Building equipment. The cycle-timed control valve in the line was removed and found to have a corrosion-failed bellows seal and a thin scale deposited on the valve inner surfaces. A new, larger control valve, control valve bypass piping, and a backflush nozzle were included in the new L-3 Concentrator to L-4 Receiver line, installed on June 22.

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The second L-5 Filter (porous stainless steel) plugged on June 17, after operating satisfactorily for more than five weeks. The filter element was removed and replaced with the previously cleaned, originally installed unit. The present element plugged almost immediately and has been plugged the majority of the time since its installation. As a result, most of the batches processed through the building after the installation have been unfiltered.

The average plutonium concentration in the product solution was 108 grams per liter (73 to 126) and the average nitric acid concentration was 5.6 molar (4.9 to 6.2). The average concentration of the major impurities in the product solution was 10,000, 25,000, 5,000, and 5,000 parts of aluminum, iron, chromium, and nickel, respectively, per million parts of plutonium.

Iodine Problem

The release of radioiodine to the Redox stack has averaged about 0.26 curie per day for the report period. However, the bulk of the iodine was released before the regeneration of B-3 Reactor on June 1. The maximum iodine released since June 1 (including the period of testing six-ton dissolver charges) was only 0.07 curie per day.

An intensive off-gas sampling program was conducted during the dissolving of a charge of 86-day-cooled metal in Dissolver A-2. It was found that the efficiency of the silver reactor was 99.9 per cent during dissolving cuts but only 92 per cent during coating removal.

Approximately 0.25 per cent of the radioiodine evolved from the dissolver during the dissolving of a charge of 97-day-cooled metal was given off during coating removal. Bypassing of the silver reactor during coating removal would, therefore, be possible only with relatively long cooled metal.

Of the 0.040 curie per day average release of I^{131} to the Redox stack during the idle period June 11 to 21, approximately 75 per cent was evolved from the dissolver cells and 25 per cent from the sand filter.

Three runs have been made in the laboratory scale back-up silver reactor installed in T Plant. Arithmetic decontamination factors obtained with this unit were at least greater than five, the removal of iodine being complete within the limits of detection. Additional runs are to be conducted under a modified procedure in order to determine the decontamination performance more closely.

Waste Storage

No eruptions have occurred in the 101-SX Tank since the auger was started on April 19. Early in the report period, the 104-SX Tank began to boil and when the Redox Building was shut down, the condensate production rate rose to four gallons per minute. An air lift recirculator and an auger were installed in the 104-SX Tank on June 10 and 13, respectively. Operation of the recirculator using ten to fifteen cubic feet of air per minute was begun on June 15. As a result, the condensate

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production rate rose to eight gallons per minute and then gradually returned to the four gallon per minute rate during the next 5.5 hours. This increased condensate rate represents the removal of 5.5 million BTU of stored heat.

PUREX PROCESS TECHNOLOGY

Initial operating procedures have been written and are being reproduced for issue. The procedures have been reviewed by Manufacturing Department operating and process control personnel. A run plan has been issued for a diluent-nitric acid flush of the plant. A preliminary schedule of sampling and analytical requirements was prepared and is currently being reviewed by Manufacturing Department analytical control personnel.

Seven men have devoted full time to assisting in the program of operability and capacity testing (including instrument calibration) of process equipment. Special calibrations of dissolver off-gas flow systems and Fiberglas filter pressure drops were made. The pressure drop data were taken in an effort to estimate the loss of efficiency of the Fiberglas filters caused by their becoming wet from steam jet condensate. Pressure drop data obtained indicated that the filters were not seriously damaged; however, it is estimated that the over-all efficiency of the C Cell filter may be up to five-fold lower than that for a new filter because of a small hole through the AA Fiberglas layer. A feasible and simple means of preventing further damage due to wetting of the filters was tested and recommended for use.

BISMUTH PHOSPHATE PROCESS TECHNOLOGY

Iodine Evolution

The magnitude of the iodine^{131} evolved has decreased (maximum 2.3 curies per day - average 1.08 curies per day as compared to maximum 8.5 curies per day - average 1.52 curies per day for May). On the other hand, metal cooled for longer periods was processed and the over-all decontamination factor decreased from 98.2 per cent to 96.1 per cent. No special samples were taken to determine which off-gas line or combination of off-gas lines was the main contributor to the evolution.

A summary of the samples taken by the Radiation Monitoring Unit during the latter part of April and the entire month of May shows the average contribution of each line to the stack to be:

3-5 L	0.17 curies/day
4-5 L	0.27 curies/day
3-5 R	0.60 curies/day
Ventilation Air	0.18 curies/day

The above figures for the off-gas lines are also broken down by per cent into either dissolving or coating removal, charging, stand-by, etc. For 3-5 L, 79 per cent of the activity to stack was evolved during dissolving and 21 per cent

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during coating removal, etc. For 4-5 L, 59 per cent of the activity released was evolved during dissolving and 41 per cent during coating removal, etc. For 3-5 R, 22 per cent of the activity released was evolved during dissolving and 78 per cent during coating removal, etc.

In addition to the above samples, four special aliquots of gas were drawn before and after the silver reactor during periods of obvious emissions from the 3-5 R system during either coating removal charging or stand-by. The data indicated from each of the runs that more radioiodine was leaving the reactors than was entering. The ratios of activity leaving to that entering for the four special samples were 3, 31, 10, and 134.

Production Test 221-T-18, "Scavenging of First Cycle Waste"

This production test has been completed. With close pH control (average 9.7 for the entire 103-TY Tank), the radio-strontium concentration in the supernate was $8.85 \times 10^{-2} \mu c/ml$, and the radio-cesium was $1.14 \times 10^{-2} \mu c/ml$. The final report is being written under separate draft.

URANIUM RECOVERY PROCESS TECHNOLOGY

Summary

The high RC and RE Column waste losses encountered last month are now believed caused by the replacement resin recently used to repack one of the demineralized water units. Although it has not been possible to define the mechanism contributing to the high losses in the laboratory, the losses were significantly reduced (to 0.2 per cent or less) whenever the demineralizer in question was taken out of service and increased several fold whenever the demineralizer containing Duolite C-25 resin was returned to service. The demineralizer containing Duolite was repacked with the resin previously used (zeocarb) and the RC and RE Column losses have since been acceptable during normal processing periods.

During the first ten days of June, the plant successfully decontaminated feed solution containing 15 month aged uranium (50 per cent of uranium this young) while operating at processing rates as high as nine tons per day. After June 10, the fission product activity of the REU product was consistently above 100 per cent aged natural uranium gamma activity, climbing eventually on individual REU batches to as high as 2500 per cent aged natural uranium. In general, flowsheet modifications designed to reduce the product activity were unsuccessful. Process Chemistry studies have indicated that the activity in the REU is contributed by solid particles which can be filtered out to give acceptable product (less than 100 per cent aged natural uranium). Studies are currently under way to determine (1) the origin of these solids, (2) methods of preventing their introduction into the system, and (3) methods for removing the solids from the system once they have gotten in.

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Metal Removal

A summary of the source, age, and irradiation history of the metal removed from the three operating tank farms is given below:

Tank	Fraction	Age[a]	Average MWD/T[b]
109-112-BY	0.077	38	500
105-108-TX	0.521	27	506
101-U	0.402	15	444

(a) Estimated minimum age since pile discharge in months.

(b) The average MWD represents the weighted average pile exposure for the metal in the cascade.

Metal removal operations were essentially routine throughout the month. U Farm feed containing uranium aged only 15 months from pile discharge averaged 40 per cent of the tank farm production, but individual batches of UR Plant feed contained up to 70 per cent of U Farm uranium. Final tank cleanout operations were continued at BXR Farm.

Solvent Extraction

A slurry-rich feed containing up to 50 per cent 15 month minimum age U Farm uranium was processed. During the period at the first of the month when adequate decontamination was attained, the plant operated at modified HW No. 6 flowsheet conditions similar to those presented in the April Separations Technology Monthly Report (HW-36440). Later in the month, when decontamination difficulties were encountered, several flowsheet changes discussed below were employed in an effort to improve decontamination.

RAW losses averaged 1.1 per cent and ranged up to eight per cent of the feed uranium. The causes of the high losses were transient upsets such as interface jettings, rapid rate changes, abnormally high uranium concentrations in the feed, high feed rates, and an RA Column pulse generator failure.

The high RC and RE Column losses encountered in the plant last month are believed caused by the plant demineralizer units. As is indicated in the table below, the RCW and REW losses significantly increased (instantaneous losses as high as six per cent) whenever the new cation resin, Duolite C-25, was used in the plant demineralizer. On June 1, when the demineralizer containing Duolite was again used in the plant, RCW and REW increased more than ten-fold over an eighteen hour period. Although the current RCW losses are not as low as those produced during the last few months of parallel column operation, the RCW losses have decreased significantly with the replacement of the Duolite cation resin with Zeocarb and have been, on several occasions, 0.1 per cent or less.

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Period	Demineralizer Unit Used	Cation Resin	Per Cent of the Feed Uranium RCW	REW
4/9/54 to 11/1/54	1 and 2[1]	Zeocarb	0.07	---
1/1/55[2] to 4/18/55	1 and 2	Zeocarb	0.3	0.06
4/18/55 to 5/17/55[3]	1 and 2	Duolite C-25 (#1 Demin.) Zeocarb (#2 Demin.)	1.8	1.1
5/18/55 to 6/1/55	None - Sanitary Water	None	0.3	0.1
6/1/55 and 6/2/55	1 and 2	Duolite C-25 (#1 Demin.) Zeocarb (#2 Demin.)	3.2	1.6
6/3/55 to 6/8/55	2	Zeocarb	0.4	0.1
6/8/55 to 6/24/55[4]	1 and 2	Zeocarb	0.2	0.1

(1) Originally, both cation units were packed with Zeocarb; anion units were packed with Chempro A-7.

(2) Series operation was started about January 1, 1955.

(3) On April 18, the No. 1 cation resin was replaced with Duolite C-25. During the preceding two weeks, the resin in both anion beds was replaced with new resin of the same type as that originally used.

(4) On June 8, the cation bed of the No. 1 unit was replaced with the original type (Zeocarb) resin.

RDW losses were generally less than 0.01 per cent of the feed uranium whenever the RDX rate was maintained at 125 per cent of the standard HW No. 6 flowsheet flow. During the decontamination difficulties, attempts to improve decontamination by increasing the RDU uranium saturation resulted in RDW losses of 0.02 and 20 per cent at RDX flows of 110 and 90 per cent of HW No. 6 flowsheet rates, respectively.

Gamma decontamination during the first three weeks of the report period (May 20 to June 10) was adequate, although REU gamma activities increased rather consistently from 60 to 110 per cent aged natural uranium, as the proportion of the feed uranium supplied from the 101-102-103-U cascade increased from 25 to 50 per cent. During the ten day period following attainment of the 50 per cent U Farm feed

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level, however, the REU gamma activity rose to 1,000 per cent. As indicated by laboratory studies, this increase was primarily due to the presence of filterable solids carrying radio-ruthenium in the product solution. Because of (1) the continuing high product activity, (2) the lack of success in reworking REU either alone or blended with RCU, and (3) the demonstrated presence of solids in the system, the plant was shut down June 21 for a thorough flush of the solvent extraction system.

During the period of high REU activity preceding this shutdown, several process revisions were made in attempts to improve plant decontamination performance. These included:

(a) High-acid (RDF nitric acid concentration increased from 2.0 to 3.9 M) second cycle.

(b) Interface jetting.

(c) Increased RDU solvent saturation (from 60 to 65, then later to 70).

(d) Centrifugation of RDF.

(e) Modification of the solvent washing technique to include a one weight per cent nitric acid wash after the normal three weight per cent sodium carbonate wash (in the laboratory, this wash procedure changed the microscopic "hot" solids in the solvent to a form which could be decanted along with the nitric wash solution).

(f) Oxalic acid used as a replacement for ferrous ammonium sulfate in the RDIS.

The last three process modifications listed above were incorporated at approximately the same time. Over the next 24 hour period, the product activity decreased approximately five-fold to approximately 200 per cent aged natural uranium. The use of oxalic acid in the RDIS was discontinued after an additional twelve hours, however, since plutonium decontamination was inadequate and REU plutonium concentrations increased to greater than 50 parts per billion parts of uranium. With the oxalic acid replaced with ferrous ammonium sulfate, the product gamma activity again returned to its previous high level.

Intercycle Concentration and Stripping

Uranium losses based on analysis of grab samples from the intercycle stripper tower (T-8-4) averaged 0.51 per cent of the feed uranium for the month, compared to approximately 0.15 per cent for April and May. The pooled condensate (from feed evaporator, waste evaporator, 224-U evaporator, and intercycle evaporator) averaged 0.6 per cent of the feed uranium. The intercycle stripper samples indicate that the major portion of the over-all plant condensate loss originates in the intercycle stripper condensate.

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Waste Handling

Approximately 5,400 gallons of concentrated scavenged waste (both nickel ferrocyanide and calcium scavenged) per ton of uranium at an average pH of 8.7 were returned to storage for settling in Tanks 106 and 110-BY. The average strontium and cesium concentrations of the scavenged Tank 11-106-BY supernatant were 0.52 and 0.37 microcuries per milliliter, respectively, slightly lower than similar analyses on Tank 10-108-BY, the first tank containing calcium scavenged waste. Soil column studies on Tank 10-108-BY indicated excellent soil retention properties (disposal at greater than 3,000 gallons/square foot of crib area), and the supernatant has been transferred to the 3-BY crib. Soil column studies on Tank 9-107-BY, the last tank of waste produced employing nickel ferrocyanide scavenging alone (relatively poor pH control) and containing 2.4 microcuries of Sr per milliliter, showed poor soil retention properties and was routed to storage for later re-scavenging.

Analysis of the supernatant contained in the first two tanks of waste scavenged with both calcium and nickel ferrocyanide show that calcium has given a four to five-fold improvement in the strontium decontamination over that obtained when only nickel ferrocyanide was used.

URANIUM CONVERSION PROCESS TECHNOLOGY

Summary

Total metallic impurities, fission product gamma activity, and plutonium in product UO_3 averaged 147 parts per million parts of uranium, 33 per cent of aged natural uranium gamma, and three parts per billion parts of uranium, respectively. The average reactivity was 1.12, using nominal 0.05 weight per cent sulfamic acid as an additive, except for three carloads in which 0 to 0.03 weight per cent sulfamic acid was used (see discussion below).

Calcination

During the first week of June, the 100 per cent UNH solution processed through the calcination pots contained abnormally high impurity concentrations (one carload of UO_3 was 100 ppm higher than normal 120 ppm). These impurities entered the solution as a result of (1) using sanitary water in place of demineralized water in the RE Column extractant in the TBP Plant, and (2) the increased corrosion in the five to sixty per cent UNH concentrator when higher acid concentrations resulted in the concentrate because of a change in concentrating conditions (a temporary condition encountered when one evaporator was out of service for repair). When this solution was processed, severe pot caking was encountered, several agitator support brace welds were broken, and one agitator blade was twisted off.

To alleviate the situation, sulfamic acid was not added to the pots for a two day period. When pot caking returned to normal and the solution purity improved, sulfamic acid was again added to the pots (initially 0.03 weight per cent, then later 0.05 weight per cent).

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A series of six calcination pot "blowbacks" over a three day period resulted in assault masks being required in electric pot room because of the potential air contamination hazard immediately following a "blowback". As "blowbacks" appear to occur more frequently when the fume vent header vacuum is low, the following steps have been taken to improve the vacuum and reduce the number of "blowbacks":

(1) Air in-leakage to the calcination pots and fume vent system has been reduced by tightening pot lids, agitator shaft seals, and plugging fume vent header leaks.

(2) The acid absorber is operated to prevent tower flooding and loss of pot room vacuum.

(3) Calcination is not to be started whenever pot vacuum is less than two inches of water. Calcination is to be discontinued whenever fume vent header vacuum is less than one inch of water.

(4) Luckey pot calcinations are to be carefully scheduled to prevent overloading the fume vent system.

(5) UO_3 powder is to be cleaned from the deentrainment chamber above the pot and fume vent system at more frequent intervals.

Since these preventive measures have been taken, assault masks have not been required in the pot room, and "blowbacks" have not occurred. However, production has been very low due to lack of feed.

At month's end, the calcination facilities were essentially shut down due to lack of specification feed solution. The average pot unloading - radiation level had risen sharply (from 16 to 91 mrads/hour) due to the processing of feed containing higher fission product concentrations (as high as 300 to 400 per cent aged natural uranium).

Tests

Initial tests on Pot 9 have been made employing a triangular cross section anchor type reversible agitator designed to minimize pot caking. Although some improvement in pot caking was noted, the improvement was believed due to the smaller pot-agitator clearance (1/8 to 1/4 inch) on the test installation rather than the basic design of the agitator.

Samples of the absorber tower off-gases taken when the calcination facilities operated at a sixteen ton per day rate indicated that 3.4 per cent of the available nitric acid in the calcination pot gases was lost from the absorber.

Automatic temperature control has been installed on Luckey Pot 19. The pot skin temperature regulates the gas flow to the furnace. The skin temperature is regulated at 625 C until the charge temperature reaches 270 C, at which time the burners are shut down.

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Work orders have been issued to fabricate and install equipment on an existing electric pot which will permit test operation as a semi-continuous unit (intermittent shutdown to withdraw powder).

Z PLANT (ISOLATION, PURIFICATION AND FABRICATION) PROCESS TECHNOLOGY

Isolation Building

Two twelve-run test lots were completed under Production Test 231-16, "Single Peroxide Process". The first lot, using a three wash cycle, was found to meet present product specifications for plutonium nitrate solution, with purities ranging from 93.8 to 99.2 per cent and an average purity of 96.4 per cent for the lot. Preliminary data for the second lot, using a two wash cycle, indicate an average purity of 92.1 per cent for ten of the twelve runs. The other two runs had purities of 78.7 and 81.2 per cent, bringing the average for the lot down to 90 per cent. These latter runs were not included in the shipment.

Oxalate Precipitation (Task I)

Redox product solution was processed through Task I routinely during the month, with an average loss to recycle of about five per cent. Processing of unfiltered Redox product solution appeared to be satisfactory. The production rate has been limited by the availability of empty filter boats and by down time for hood modifications. Extensive modifications which are being made to Task I equipment include the installation of surge tanks in the agitation air line to improve pulse characteristics, auxiliary hoods for the chemical addition facilities to aid in contamination control, and additional lines to facilitate the flushing of hood floors.

The maximum production for one 24 hour period, thus far, is nineteen runs.

One overbatch incident occurred when 520 units were loaded into a recycle can which has a 400 unit batch limit. Operations personnel have set up procedures to tighten control on supernatant return.

Hydrofluorination (Task II)

The refluorination rate averaged about 20 per cent during the month, compared to 30 per cent for May. Process changes which may have contributed to the decrease were the use of the HF preheaters for three of the furnaces, and an increase of 30 minutes in the HF exposure time (to four hours).

Reduction (Task III)

The use of an iodine booster in the reduction operation continued through the month. Better yields were obtained when the iodine was added (99.3 per cent average yield for ten runs with 160 grams of iodine per charge; 99.2 per cent average for 30 runs with 80 grams; and 98.0 per cent for the majority of the runs which were without iodine). The button-crucible sticking problem has not been completely solved, although button removal was made easier by the use of iodine.

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RECUPLEX

Start-up

Uranium stand-in runs simulating plutonium waste recovery flowsheets have been in progress throughout the month. Twelve synthetic slag-and-crucible charges and eighteen batches of magnesium nitrate were processed through the S&C solution preparation equipment to supply feed for the solvent extraction system. Solvent extraction operations were based upon Recuplex preliminary flowsheet Nos. C-7 and C-9, modified as made necessary by the substitution of uranium for plutonium. Runs for HTU data and column flooding characteristics were completed at volume velocities of 340, 550, and 680 gallons/hour x square foot. Column performance, in general, was very good, with low waste losses and satisfactory operational stability.

Highlights of the work performed by the maintenance forces during the month have been (1) installation of pressure switches on the process agitators to prevent their operating dry, (2) installation of an emergency shutdown circuit, and (3) replacement of the neoprene gaskets on the removable hood panels with Tygon tubing gaskets.

Laboratory Development

An 80 g/l product solution can be produced when processing partially concentrated Redox 3BP by Flowsheet C-11. In a miniature pulse column run, product concentrations as high as 96 g/l were measured. Although the stripping column approached pinching at this high concentration, operation to result in 80 g/l product is assured.

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Solvent which had recycled through the pulse column system four times without cleanup treatment was subjected to cleanup and then introduced in the extraction column for the fifth time. No flooding or unusual dispersion-coalescence was observed, hence solvent cleanup after every pass may be unnecessary.

A plutonium - DBP "red oil" separated from solvent cleanup oxalic acid solution when it was killed with permanganate. This behavior is evidence for enhanced solubility of plutonium - DBP in oxalic acid. Compound formation has been postulated, for example, Pu (DBP)(C_2O_4). Since the DBP would be returned to process after killing the oxalate and re-extracting, an alternate washing solution will be investigated, such as a reducing solution.

Plutonium valence adjustment in killed oxalate supernatants is a matter of concern since the conventional peroxide treatment in the presence of five g/l Fe^{+++} results in 87 per cent plutonium(VI). Alternatively, treatment with 0.05 M $Fe(SO_3NH_2)_2$ followed by sodium nitrite results in 100 per cent plutonium(IV), with laboratory solutions.

234-5 DEVELOPMENT

Oxalate Precipitation - Task I

To determine if the high Task I recycle rate in the RM line is due to inadequately specified chemical conditions, two oxalate precipitations were made in the Task I prototype precipitator, using PR solution. The low solubility losses (0.45 per cent or less) indicated that solubility is not the cause of high recycles. Easily filtered, good colored, free flowing cakes were obtained under simulated plant conditions.

Continuous Hydrofluorination

A batch of plutonium oxalate was calcined in the vibrating tube reactor, and the oxide product was then hydrofluorinated in the vibrating tube reactor. The instantaneous processing rate was 0.8 kg per hour. The hydrofluorination temperature was 530 C and the holdup time 60 minutes. Mechanical stability of the vibrating reactor is good, evidenced by two months of continuous cycling since adjustment of the damping system. Coupling the hydrofluorination step with Task I by a continuous drum filter and screw-dryer-calciner will shortly be tested.

Ultrasonics as an Aid to Dissolution

The rate of dissolution of nickel in fuming nitric acid is markedly increased by application of an ultrasonic field. In one experiment, a piece of foil dissolved in less than one-fourth the time required without the field. Although the application for coating removal is probably not justifiable, other applications are sought. The rate of aluminum dissolution in 4.5 M HNO_3 is unaffected.

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CHEMICAL DEVELOPMENT SUB-SECTION, F. W. WOODFIELD

PUREX DEVELOPMENT

Process Planning

As part of a program to show the incentives for research and development studies with the objectives of simplifying present H.A.P.O. separations plants, a simplified, idealized flowsheet has been developed and documented (HW-37210) for use by the Design Section in pre-scoping studies. The flowsheet is essentially a simplified Purex flowsheet incorporating mechanical slug dejacketing, continuous dissolution, an A-B-C partition decontamination cycle, and a 2A-2B plutonium reflux-decontamination cycle. Solvent recovery is achieved in a single carbonate-wash contactor. Acid recovery and waste concentration are accomplished in a combination concentrator-fractionator unit which produces waste acid and waste water streams plus an 8 M recovered acid stream for dissolver feed. Although the equipment and chemical technology implied in the flowsheet are beyond the scope of current knowledge, their development in two to five years is considered not out of reason if sufficient incentives are shown to exist.

Chemical Engineering Development

Waste Tank Bumping. Tank T-2 in the 321 Building Tank Farm has been prepared and filled with simulated waste for testing a draft-tube recirculator proposed by the Design Section for mixing the contents of the underground waste tanks to minimize bumping as these tanks boil from self-heating.

Separations Equipment Development

Pulse Generator. Testing of the small (Size 1) Purex Pulse Generator has started (employing the Purex Prototype 2A Column) to determine the rate of leakage past the piston, maximum and minimum pressures at the piston during operation, and air flow into the pulse leg required to balance the liquid statically in the column. As expected, reducing the size of the weep hole in the piston from 3/32-in. to 3/64-in. reduced the leakage rate past the piston from 0.48 to 0.24 gpm. The pulse generator is now being given an extended run in after which leakage and other pertinent data will be taken again. Operation has been very smooth to date, and no mechanical problems have been encountered.

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Agitator. The Purex agitator installed in the 321 Building Tank Farm failed after 4,993 hours of rugged test operation. Failure of the shaft from metallic fatigue terminated test activities for the present. The unit had operated 3,690 hours at varying liquid levels (from 76 inches submergence to one inch submergence) and for 1,032 hours with the turbine just touching the liquid, prior to 270 hours of dry operation. The fracture point was located in the throttle bushing area and failure resulted in destruction of the bushing by the ragged edges of the shaft. No changes in character of operation were noted during the testing.

On the basis of this test, the Purex Plant agitators would be expected to operate trouble-free for several years provided the units are always operated with the paddles submerged in liquid.

HOT SEMIWORKS PUREX STUDIES

During the report period two runs, PX-3 and PX-4, were completed. The first provided a more thorough test of a reduced (from HW No. 3 Flowsheet) solvent flow in the HA and IA Columns than was obtained during PX-2. The effect of interface position in the IA Column was also studied. During PX-4 the effects of doubling the HA and IA scrub rates were studied. During Run PX-3 the decontamination in the HA and IA Columns was low by factors of approximately 10 and 4, respectively -- apparently due to inadequate scrubbing. In Run PX-4 adequate decontamination in the A-type columns was achieved, but at the expense of very high losses of plutonium. The plutonium was largely recovered in a service run. In addition to the above two runs, three ruptured bellows were replaced during the month following a decontamination of B-Cell.

Process Chemistry

Hot Semiworks Assistance. Studies to determine the cause of the relatively poor Zr-Nb decontamination which has occurred in Hot Semiworks Purex runs to date continue to indicate inadequate scrubbing as the primary cause for the poor decontamination. However other potential factors, e.g., entrainment and solvent quality, are being investigated.

REDOX DEVELOPMENT

Chemical Engineering Development

Thiosulfate Scavenging. One "cold" pilot-plant test of thiosulfate scavenging head-end treatment for Ru decontamination was carried out during the month. The feed solution was 0.3 M in HNO_3, and oxidation was accomplished after centrifugation. The finely divided free sulfur usually found in the centrifugate using the above procedure and acid-deficient feed was not obtained. No difficulties were encountered in pumping or jetting the precipitate or in removing the cake from the centrifuge. These results indicate some latitude in procedure, but

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do not as yet imply any changes in the procedure recommended for the Redox Plant test. At the completion of this 13-run series in pilot-plant equipment, measurements were made of the heat transfer coefficient across the digester steam coils, and of the jetting rate of the steam jet used to transfer the thiosulfate slurry from the digester to the centrifuge feed tank. Comparison with initial values showed no change, indicating that there was no significant fouling by the precipitate.

URANIUM RECOVERY DEVELOPMENT

Process Chemistry

221-U Building Decontamination Performance. The radioactive content of the uranium product stream (REU) from 221-U Building increased during the week of June 13 to 20 from approximately 200 to 700 per cent of the gross gamma activity of aged natural uranium. Greater than 95 per cent of the activity was found to be Ru^{106}. Investigation of REU samples revealed that a gross gamma decontamination factor of approximately ten could be attained by filtration through one inch of Pyrex glass wool. Further investigation showed the presence of a similar material in the carbonate-washed solvent. Contacting the solvent with dilute (0.1 M) HNO_3 concentrated the radioactivity entrained in the organic phase at the aqueous-organic interface, thereby reducing the solvent activity from 1200 to 8 microcuries per gallon. A study of filter media suitable for plant filtration of REU and ROO is under way.

In a miniature pulse column run simulating RD Column conditions and utilizing plant solutions for all streams, significant amounts of interfacial crud were observed and periodic carry-over of filterable radioactive material occurred. The gross gamma activity of the REU was as high as 1000 per cent of aged natural uranium (A.N.U.) with this carry-over present, but was reduced to approximately 100% of A.N.U. by filtering. Organic phase analyses indicated a 100-fold decrease in the gross gamma content of the ROO (from 1200 to 10 microcuries/gal.) as a consequence of transport through the RD-RE cascade. No interfacial crud formation was noted in a second run made under identical conditions except for the use of laboratory prepared RAX. The gross gamma content of the REU from this run was approximately 60% of A.N.U.

Continuous Calcination

Three runs were made in the 16-inch diameter by 8-ft. long semi-plant scale continuous calciner to determine the effect of low bed temperature on product quality and to determine the effectiveness of steam as a means of hydration in the reactor. The first run was carried out at a feed point temperature of 230°C., with the addition of 1,000 parts of sulfate per million parts U, and with the introduction (near the discharge point) of 1.5 times the amount of steam required to form the monohydrate.

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The second run was carried out under identical conditions except that no steam was used. Results showed that the introduction of steam had no measurable effect on product quality or water content of the UO_3. Pulverized samples of UO_3 (from both runs) were 97% reduced by hydrogen at 575°C. in approximately 1.5 minutes. This represents a five-fold improvement in the reduction rate of most previous UO_3 produced in this continuous calcination equipment and compares favorably with the 97% reduction of Hanford pot-produced UO_3 in approximately 1.2 minutes. The reactivity of the UO_3 to hydrofluorination was about 0.85 relative to the standard.

Run three carried out at a feed point temperature of 210°C. with no steam showed about the same favorable reduction rate, but the hydrofluorination reactivity decreased to 0.6. Although the reactor was operable at low bed temperatures (205 to 210°C.), with a moderate increase in drive power requirements, some cake formed on the agitator.

WASTE TREATMENT DEVELOPMENT

Process Planning

Waste Self-Concentration. In cooperation with the Manufacturing Department and the Design Section, Separations Technology has participated in a study of potential hazards and the preparation of safe operating procedures for permitting Hanford neutralized high-activity wastes to self-concentrate in mild-steel underground waste storage tanks. This study, which includes proposed safe operating procedures, will be issued as HW-37207.

Cribbing Coating Wastes. The aqueous wastes produced in the aluminum slug-jacket removal process are presently being stored in underground waste storage tanks at a cost of 10 to 30 cents per gallon ($25 to $75 per ton of U processed). The coating wastes could be cribbed or "caverned" (with appreciable economic savings) if the caverning did not allow the long half-lived (greater than three years) radio elements to reach the ground water table.

An experimental test crib facility has been proposed to establish the necessary operating conditions and/or types of scavenging additives to prevent penetration of the long-lived radioisotopes to the ground water. Operation of this crib will augment the laboratory work on scavenging and soil retention type decontamination studies.

Process Chemistry

The use of strontium vice calcium to aid in scavenging U.R. Process wastes has been continued to find optimum conditions. Best results were obtained in the laboratory when the wastes were made 0.0025 M in $NiSO_4$ and $K_4Fe(CN)_6$ and 0.004 to 0.008 M in $Sr(NO_3)_2$. Phosphate concentration should be in the range of 0.06 to 0.3 M. All reagents should be added to the acidic waste and neutralization should be to a pH of approximately 9.5. Laboratory experiments under these conditions have consistently produced supernatant liquids containing less than 0.1 microcuries/ml. of either Cs or Sr. Plant solutions scavenged under these conditions were submitted to the Soil Sciences Group for evaluation in soil columns. Preliminary results are encouraging, indicating that from two to three column volumes may be passed through the soil before strontium breaks through.

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MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

In-Line Chemical Instrumentation

The Uranium Recovery Plant pH sensing unit has operated without incident since periodic flushing with concentrated nitric acid to remove alkaline deposits and use of more dilute potassium chloride solution in the calomel electrode was started.

A new flow-type pH cell has been tested in the 321 Building test installation. The tests have shown design shortcomings such as poor air bump removal and inadequate electrode couplings. Waste neutralization control equipment is being installed for further testing of the sensing unit design and the control system design.

An iodine monitor that directly counts the iodine in the dissolver off-gas has been designed, and construction of a prototype for installation at T-Plant is nearly complete. It is essentially a single channel gamma energy scintillation spectrometer set to count the gamma emission from Iodine-131, discriminating against radio-ruthenium, radio-xenon, and radio-krypton.

Mechanical Dejacketing of Slugs. A literature review has been made and preliminary scoping has been started for a development program to dejacket irradiated slugs mechanically. At the present time, rolling to remove the aluminum jackets looks more promising than either a cutting or extruding operation.

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CHEMICAL RESEARCH SUB-SECTION, W. E. REAS

PUREX

Further studies of the steam distillation of TBP-hydrocarbon solvents were carried out with the objective of defining the entrainment properties of the apparatus and elucidating the mechanism responsible for the decrease in distillate quality with retention time noted in previous studies. Application of the apparatus and techniques previously employed to the distillation of recovered Hot Semi-Works solvent resulted in a gross beta decontamination factor (bottoms/distillate) of 200. Since installation of a simple baffle in the vapor effluent line from the still pot sufficed to increase the beta decontamination factor to 2000, it appears that entrainment may well have been a significant factor in earlier studies with this apparatus.

Steam distillation of carefully purified 30% TBP-Soltrol solvent at 180 C resulted in no detectable discoloration of the solvent but did result in a significant increase in the uranium distribution ratio in the "C" contact test. A "C" contact value as good as that of the feed and well within specifications was obtained after carbonate washing of the distillate, however. It is concluded from this observation that the decrease in distillate quality with increase in retention time observed in previous studies of the distillation of unusable solvent obtained from tank 386 of the Uranium Recovery plant cannot be attributed to degradation of the bulk solvent but must be ascribed to conversion of impurities to more volatile species under the conditions (180 C) existing in the still pot.

Equipment difficulties were experienced on attempting additional continuous distillation experiments simulating operation of the Purex #1 acid concentrator. Bumping in the concentrator flask caused high entrainment into the distillate and thus obscured ruthenium transport by volatilization. A new apparatus was designed, constructed and tested which achieves boiling with a tube heated by a coil. Investigations of the effects on ruthenium volatilization of dissolved solvent in the acid feed and of heating the de-entrainment section are scheduled.

REDOX

Investigation was continued of nitrite pretreatment of Redox second uranium cycle feed to improve ruthenium decontamination. Seven experiments simulating the 2D and 2E columns (dual scrub), four with nitrite pretreatment and three without for controls, were performed on a fresh Redox 2DFS solution. Typical conditions for the pretreatment were 3 hours at 85 C with 0.03 M nitrite. Ruthenium decontamination factors obtained with the nitrite pretreatment ranged from 2.1 to 3.4-fold greater than for the controls, similar to results obtained on an earlier solution. This improvement in decontamination resulting from the pretreatment decreased with age of the 2DFS solution, since decontamination factors for the control increase steadily with sample age. Extrapolation of

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the data indicates that a 4 to 4.5-fold improvement in ruthenium decontamination would be obtained for 2DFS 0 to 2 days old. This may be compared with the 2 to 5-fold increase in gamma decontamination which has been estimated to be necessary to meet specifications (HW-35496), if the dichromate head-end were to replace the permanganate head-end. The solution used in this study was from a permanganate head-ended run and the ruthenium activity was therefore very low, being only 3% of the total gamma activity of the solution. Filtration of the 2DFS before use removed roughly half of the total activity. No difference was observed in the effectiveness of sodium nitrite, nitric oxide, nitrogen dioxide and mixtures of the latter two as the source of nitrite in the pretreatment.

THOREX

The effect of flowsheet variables on the extraction of thorium by hexone was studied in miniature mixer-settler runs. Five runs were made with a flowsheet as follows:

Feed: 1.8 M Th, 0.67 M ANN, 0.3 M HNO_3, 0.03 M HF; Relative Flow: 100
Aqueous Scrub: 2.5 M ANN; Relative Flow: 370
Extractant: Hexone, HNO_3 variable; Relative Flow: 1070

Thorium waste losses were 5.8% for 0.1 M HNO_3, 0.12% for 0.2 M HNO_3, 0.03% for 0.3 M HNO_3, and 0.02% for 0.4 and 0.5 M HNO_3 in the hexone extractant. Thus, any hexone acidity of 0.2 M HNO_3 or higher should enable adequate recovery of thorium with this flowsheet.

The effect of ANN concentration in the scrub was examined in three runs employing a flowsheet as follows:

Feed: 1.8 M Th, 0.67 M ANN, 0.3 M HNO_3, 0.03 M HF; Relative Flow: 100
Aqueous Scrub: ANN variable; Relative Flow: 370
Extractant: Hexone, 0.28 M HNO_3; Relative Flow: 1070

Thorium waste losses were 0.05% for 2.5 M ANN, 0.4% for 2.25 M ANN, and 2.4% for 2.0 M ANN in the aqueous scrub. Thus, scrub ANN concentrations of ca. 2.4 M ANN or higher appear necessary to assure adequate recovery of thorium with this flowsheet.

Additional full-level manganese dioxide scavenging studies were performed to determine the feasibility of recovering protactinium by scavenging of feeds high in thorium and low in acid such as would be desired for processing thorium in the Redox plant. Results obtained confirmed those obtained in previous tracer level studies, i.e., protactinium carrying is poor out of such systems. For example, protactinium decontamination factors in scavengings with 0.05 M MnO_2 out of 1.5 M Th were only 3.3 out of 0.5 M HNO_3 and decreased as the acidity was reduced, reaching a value of only 1.5 for scavenging of 0.2 M acid deficient feeds. Three successive scavengings out of 1.5 M Th, 0.5 M HNO_3

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solution resulted in an over-all protactinium decontamination factor of only 8.6. With feeds 1.5 M in thorium and 0.1 M in HNO_3 the protactinium decontamination through three scavengings was only 3.8. By comparison, three successive scavenging operations performed with 1 M Th, 1 M HNO_3 result in protactinium decontamination by factors of the order of 1000.

SILVER REACTOR

Nitrosyl chloride, a constituent expected in dissolver off-gas in the event of even small chloride impurity, has been shown to exchange rapidly with iodine in a silver nitrate-iodine system and thus provides another possible mechanism for iodine transport in a silver reactor. When nitrosyl chloride was passed over a bed of silver nitrate coated 1/4-inch Berl saddles at 190 C on which iodine had previously been fixed, iodine crystals deposited in the cool exit tube from the bed soon after the experiment was started.

In the foregoing monthly report, a reaction between $AgNO_3$ and NH_3, as well as $AgNO_3$ plus I_2 and NH_3, was discussed and it was implied that the reaction products, $AgNO_3 \cdot 2NH_3$ and $AgI \cdot 1/2\ NH_3$, respectively, were volatile. Theoretically such compounds as these should not be volatile and should dissociate readily. Recent experiments show that these compounds are not volatile but because of the manner in which they are produced tend to have an extremely fine particle size (0.5 microns or less) which allows these compounds to move freely in flowing gas systems.

Continuing efforts to elucidate the reaction between silver nitrate and iodine have been along the following lines: (1) chemical analysis of the solid reaction product for iodide, oxidized forms of iodine and total iodine, (2) x-ray diffraction analysis of the solid products, (3) the effect of nitrogen dioxide on the solid reaction product, and (4) collection and analysis of the gases evolved in the reaction.

One of the primary objectives of the first two steps of this study was to determine whether or not iodate is one of the products and, if so, what proportion. Both chemical and x-ray analyses indicate that iodate is formed in significant amount over a broad temperature range (70-150 C) but that the fraction of total iodine as iodate varies widely (12 to 30 percent). This variation indicates the participation of competing reactions, which is not surprising considering the number of possibilities.

The iodine absorption reaction was shown to be at least partially reversible at 90 C. Specifically, on passing a mixture of nitrogen dioxide and air over an iodine-silver nitrate reaction system at this temperature, iodine was evolved as evidenced by disappearance of the characteristic yellow color, reduction of the iodine content of the solid and appearance of iodide in the exit line caustic trap.

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Information obtainable from analysis of gaseous reaction products is fragmentary and somewhat difficult to interpret at this point. In the first quantitative experiment conducted in a vacuum line system the reaction

$$3\ AgNO_3 + 3/2\ I_2 \longrightarrow 2\ AgI + AgIO_3 + 3\ NO_2$$

was indicated. This represents a much lower iodide to iodate ratio than obtained in other flowing systems. This study will be continued to determine equilibrium values as a function of reaction temperature.

FLUREX

The latest preparation of uranium(IV)-sodium double fluoride was conducted with the sodium concentration of the catholyte lowered (from 0.5 to 0.035 M) in an effort to reduce the sodium content of the product and with the substitution of a platinum gauze for the oxidized gold wire anode used in earlier runs. Compared to previous runs, a fourfold increase in current density was achieved without appreciable hydrogen evolution (i.e., without sacrifice in current efficiency). More important, coalescence of the metal reduction button was greatly improved and the reduction yield increased to 90 percent compared to earlier yields of ca. 65 percent.

ISOTOPE

Conditions have been established for successful operation of the "isoelectromigration" process using glycolic acid and m-benzene disulfonic acid as complexing agents. The essential condition is that the pH of the neutral complex be established and that buffers corresponding to this pH be flushed through the anode and cathode compartments. The extent of the pH gradient produced on electrolysis will then be inversely related to the rate of flow. Two runs of 18 and 50 hours' duration were made with the disulfonic acid system using a cellulose packing and static buffering. The second of these indicated a slight enrichment in the cathode region and slight depletion in the anode region. The difference in U-235 content of the two samples, however, was barely outside the precision limits of the analytical method. Two runs were also made with the gylcolic acid system using an unpacked U-tube with overflow type electrode chambers for dynamic buffering of the anolyte and catholyte. Analytical results on only one run (of 100 hours' duration) have been obtained, with slight enrichment appearing at the cathode. It is believed that too much convection occurs in the unpacked tube to demonstrate appreciable effect. A run using a methylcellulose gel to suppress convection has been completed but no results are as yet available.

Preliminary experiments in the fused salt electromigration of plutonium(III) chloride indicate that silver chloride will serve as a suitable companion salt.

A batch contacting experiment to determine the separation factor in the system uranium(IV) resin-uranium(IV) chloride is in the second of six projected stages.

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A second experiment has been completed in the investigation of the exchange kinetics of the system uranium(IV) resin-uranium(IV) chloride. In this experiment, a two percent cross-linked resin was used, in an effort to evaluate the role diffusion plays in the process. Analytical results are pending.

Experiments on the tartrate elution of Pu(III) from Dowex 50 showed chemical exchange stage heights of about 1.5 cm. Conditions were like those of previous experiments except a more uniformly sized resin (50-60 mesh) was used and an increased flow rate of elutriant (0.5 $ml/cm^2/m$ vs. 0.2 $ml/cm^2/m$) was maintained.

Preliminary experiments have been initiated to determine the utility of samarium as a stand-in for plutonium in ion exchange work.

RADIO AND RADIATION CHEMISTRY

A technique for the electrodeposition of very uniform, thin plutonium "foils" has been developed involving the use of a perforated disc anode having a reciprocating vertical motion. Deposits in the thickness range 0.25 to 0.45 mg/cm^2 were prepared which had a uniformity of ca. ±5% (standard deviation as a percentage of the mean) according to autoradiographic measurement. This uniformity is acceptable for the high g/T plutonium foils required for the program of fission cross-section measurements to be conducted with Physics Research. Plutonium for one of these foils, prepared by long irradiation of Pu-239 in the MTR, has been isolated and decontaminated from inactive impurities, fission products and other transuranic elements by a combination of ion exchange, solvent extraction and precipitation separations methods.

Design of the gas scintillation fission counter facility is near completion. Chamber testing pends receipt of the special quartz cylinders from the vendor. This facility is to be used for high precision, plutonium-240 isotopic analyses.

Spatial distributions within a slug, of fission products and heavy element nuclides, will be determined in a cooperative program with Hanford's radiometallurgy and physics groups and KAPL. This study will be carried out as a supplement to Bluenose investigations; samples for dissolution and analyses are expected to be available beginning ca. August 1.

The radiation shield for the cobalt-60 source has been received from Allied Engineering and is being assembled in the 325 Building. Accessory equipment is being fabricated in the Technical Shops. The unit consists of a 7-ton tub containing two 7-inch diameter wells and a 2-ton cask containing four cobalt sources which can be located above either of the wells. Any of the four sources may then be lowered into the well. Seven cobalt pins have been discharged from H pile from which four sources ranging from about 5 curies to 1200 curies will be selected and loaded into the cask during the next month.

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ANALYTICAL DEVELOPMENT

The burner fusion method which was installed last month for preparing fluorescence melts for uranium determinations was found to provide good melts from several lots of sodium fluoride which were previously found unsuitable for use in the induction heater fusion method. Two such lots of sodium fluoride were studied in more detail. Although spectrographic analysis and x-ray diffraction revealed no difference between these and so-called "good" fluoride, the induction heater fusion yields discolored melts which have a very appreciable quenching factor. On the other hand, burner fusion produces clear melts with this material and no quenching occurs. A comparison of x-ray diffraction patterns of fluoride melts obtained by different fusion procedures and containing various impurities has not provided an explanation for this unique phenomenon.

A study of the contamination of 200 Area process water from an ion exchange demineralizer was initiated. A certain high waste loss problem in the Uranium Recovery plant seems to correlate with the use of a new charge of cation demineralizer consisting of a polystyrene base resin. The previous resin, a sulfonated-coal base, is no longer available in adequate quantity. Upon examination of samples of current process water and of both resins in the laboratory, it was found that an amber colored, water soluble material is leached from the polystyrene-base resin and was still detectable by ultraviolet spectrophotometry in process water from a demineralizer which had been used one month and had been regenerated about nine times. No such colored material was found in water from the sulfonated-coal resin. The colored material has an ultraviolet spectrum similar to a class of diphenyl methane derivatives. It is probably a sulfonated, low molecular weight polystyrene degradation product. Observations of the effect of the two resins on pure water are that "C" contact times and extraction rates are not affected, but the polystyrene-base resin lowers the surface tension of the water significantly. Foaming tendencies have not been measured.

Work on spectrographic methods for thorium analysis was concluded with the preparation of standard comparison plates for seven key impurities in thorium. The sensitivities were very similar to those for uranium and, in all cases, the detection limits established were lower than the present metal specification targets of the AEC.

Calibrations for five elements in water by the spectrographic method have been completed and the new method will be applied to pile water samples. If warranted, the method can be applied to many additional elements. The present procedure fulfills a need for analytical control of the KAPL closed-loop pile coolant experiments where alternate methods, when available, are not sufficiently sensitive or precise. The estimated over-all precisions (standard deviation) of the new method for the five elements at the five microgram level range from 10 to 30 percent and at the 40 microgram level from 5 to 10 percent.

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Research on the hollow cathode method of spectrographic excitation has led to a promising excitation technique for uranium isotopic analysis. In the spectrum obtainable, the uranium isotopic shift lines at 4244A are clearly resolved as a result of the narrower line and reduced background obtained by this method as compared with arc or spark excitation.

Miscellaneous analytical activities include preparation of two analytical procedures for dibutylphosphate, revision of the method write-ups for two x-ray photometry methods, calibration of the infrared spectrometer for tributylphosphate in Soltrol diluent to provide analytical service to the Hot Semi-Works, and an infrared spectrophotometric examination of two crud samples from the separations process plants. In the latter study, the samples were classified or typed as to general structure thereby assisting Manufacturing in determining the probable origin of the crud. Assistance to the process control laboratories was provided in several cases, involving methods for nitrite in Purex solutions, TBP by flame photometry, uranium losses in coating waste, and plutonium assay by coulometry.

IN-LINE ANALYSIS

Personnel of the unit continued to follow the instrumentation program in the Hot Semi-Works on all shifts. Considerable progress in debugging has been made so that instrument downtime and maintenance are being reduced. Since the major problem associated with gamma monitoring at present is that of maintaining sufficiently low cell backgrounds, a thorough study of cell construction materials is being made. Data obtained to date indicate that aluminum cells are best for the aqueous streams and lucite for the organic streams, although much improvement is still possible. New aluminum cells are being made with a modification to eliminate a crevice at the interior of the weld seam. All gamma monitors are being modified to provide that the cells are drained promptly to reduce contact time after readings are taken each cycle. In addition, an automatic cell rinse has been incorporated on the IOO and HAP gamma monitors. In a test rinse, the IOO monitor cell background was lowered by a factor of two. A study of decontamination solutions for gamma monitor cells was made in the laboratory. Strong nitric acid or TBP solutions were found most practical for plant use although decontamination is only partially complete. Other materials, e.g., TTA solutions for decontaminating glass cells, are more efficient for laboratory use but not acceptable in plant streams.

Consistent with the findings reported last month, newly designed aqueous feed stream uranium monitors were installed at the HAP and LAF locations. These performed without breakdown all month. Correlation of laboratory analysis with monitor data from the organic streams of Run No. P-3 was completed and all values checked within four percent.

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The HAW polarographic monitor was put back in service before Run PX-4 and the data from HAW and 1AW checked well with laboratory results. During Run PX-4a (Recycle) the polarographic data were not usable. This has occurred previously in the Uranium Recovery plant in the case of recycle runs.

Instruments out of service during Run PX-4 were the 1BU photometer (plumbing leak), and the 1AP photometer and the T-69 pH (plugged sampling lines). During Run PX-5, a plugged line put the 1AF photometer and gamma monitors out of service. The 1WD gamma monitor will be removed since adequate sampling is not possible from that stream.

The pH monitor rinse solution has been changed to a pH 4.5 buffer in order to provide an additional standardization point.

The master programmer was altered slightly as the first step in a modification to change the entire programming sequence. This will simplify both maintenance and data presentation.

A study of the thulium source absorptometer was made to obtain data on sensitivity to uranium and plutonium concentration, on interferences of light metal impurities, and on the effect of ion chamber wall material on sensitivity. Additional in-line instrumentation activities included redesign of a uranium photometer previously used on the Uranium Recovery RAF stream in order to permit application to the RDF in the same plant, and assistance in design of a turbidity monitor for a product cake dissolver of the Bismuth Phosphate plant. The Recuplex waste alarm monitors are operating properly but are not delivering reliable information because of entrainment of second phases in the photometric cells.

LABORATORY SERVICES

One million five hundred thousand (1,500,000) gallons of "retention" level waste was processed to ground in the 300 Area. "Retention" waste volumes have increased during the past six months from a monthly average of 1,000,000 gallons to the current 1,500,000 gallons.

Thirty thousand (30,000) gallons of "cribbing" level waste was transported to 200 West for discharge to 200 SL Cribs.

All other decontamination, laundry and building service functions were accomplished in a routine manner.

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ANALYTICAL LABORATORIES, E. P. GALBRAITH

General Chemical Laboratory

Further testing of the new Jarrel-Ash Company fluorimeter, referred to in last months report, was continued to determine the precision of uranium analyses in the concentration range normally encountered in routine use. Aqueous standards, free of quenching materials, containing 5×10^{-8} gram to 5×10^{-6} gram of uranium per sample were employed for the test. Precision at the 95% confidence level for eight (8) points ranged from ± 3.2% to ± 14.4%. The same standards were checked on the old HAPO model fluorimeter with precision values from ± 12.5% to ± 23.0%. The study will be continued to formally establish the optimum amount of uranium to be used in the determinations.

Synthetic standards and a spiked sample technique were employed to determine iodine, iodide, and oxides of iodine in samples containing iodine and silver salts in the presence of excess silver nitrate. All samples were successfully analyzed.

Testing of the various routine titration methods of nitric acid in aqueous systems was completed during the month. Precision studies were made on systems containing -0.1 M to +0.1 M acid and 0 M to 1 M ANN and 0 M to 2 M UNH. As to be expected, least difficulty and best results were obtained with only acid and base present and most difficulty and poorest results were obtained in the concentration range of -0.1 M to + 0.1 M acid and gross amounts of salts. The conductometric titration method of nitric acid in this difficult range offers some advantages over the normal oxalate complexing titration procedure. However, only slight gains were made in comparision to efforts and cost necessary to make such gains.

Radiochemical Laboratory

Fission counting, for the determination of Pu^{240} was trouble-free for the entire month. The backlog of samples has been completed, permitting analysis to be made on a current basis.

The ORNL U^{233} Assay by Hexone Extraction was found to fail for concentrated thorium solutions due to incomplete scrubbing of thorium from the hexone phase. An additional scrub or two at exactly 1.6 M ANN was found to remove thorium completely, thus giving a disc free of salts and thorium alpha activity.

Preliminary studies have shown Burner Type Fusion in fluorimetric uranium analysis to have advantages not found in the present induction furnace fusions. It has been observed, however, that some disadvantage occurs when the samples subjected to fusion contain radioactive ruthenium. The ruthenium is apparently reduced in the flame to metal and does not dissolve during the subsequent dish cleaning procedure. Hence, background at exposure level tends to increase. Additionally ruthenium was not removed by drastic wet oxidizing agents. Preliminary studies have indicated the ruthenium can be volitalized from platinum in an oxygen atmosphere at 1000° C. A ten minute treatment gave a two-fold activity reduction and twenty minutes, more than a three-fold reduction. Therefore, exposure levels of fluorimetric dishes can readily be held to any prescribed level.

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Spectrochemical Laboratory

Work continued on fabrication and mounting of remote controls for the enclosed "Hot" sources stand. Standards have been prepared and calibration started.

Mass Spectrometry

The consolidated-Nier Isotope-Ratio Mass Spectrometer was returned to full service during the month. Other Mass Spectrometers operated successfully through the month.

Controls to enable the Mass Spectrometer operator to set and check the Ion gage trip point without the services of an instrument mechanic were incorporated into the Ion gage panel of the G.E. Spectrometer according to Suggestion No. 16271.

Work continued on the Vacuum Fusion apparatus for gas in metal analysis. Outgasing for two hours at 2000° C. reduced blanks to tolerable levels. Analysis of zirconium wrapped in iron foil failed due to high gas content of the foil. The absence of foil gave inconclusive results. The analytical part of the system functioned properly as shown by applying standard gas mixtures having a composition similar to that expected for the gas in zirconium. At month end, some modifications of existing procedures are being investigated.

Water Quality Laboratory

Work continued in support of Recirculation Technology and Pile Coolant Units. The photomultiplier microphotometer referred to in last months report was taken out of service due to failure of the electronic components of the instrument

Work volume statistics for the Analytical Laboratories Unit are as follows:

	MAY		JUNE	
	No. of Samples	No. of Determinations	No. of Samples	No. of Determinations
Research and Development				
Pile Technology				
Metallurgy Research	41	427	76	821
Pile Materials	75	660	220	1680
Fuel Technology	60	814	43	89
Separations Technology				
Chemical Research	717	1606	690	1406
Chemical Development	590	1931	250	1483
Plant Processes	98	144	18	27
Process Technology	365	1327	113	391
Other Customers	137	462	92	438
Total	2083	7371	1502	6335

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TECHNICAL SHOPS UNIT - L. J. LUCAS

Mechanical Shops

During this period surplus machine tool equipment, owned by the A.E.C. and located at the Fairchild Engine Division Plant and the Carrier Corporation, was inspected by a representative of the Technical Shops. Seventeen major machine tools were found to be acceptable for H.A.P.O. use including four for the 100 Area shops, three for the 200 Area shops, and ten for the Technical Shops. Purchase orders have been issued for this equipment with delivery expected in September.

A survey to determine the optimum personnel levels for all groups in the unit will be started during the month of July. Major customer components of the unit will be requested to ascertain their requirements and to assume the obligation of providing sufficient work throughout the year for the number of personnel requested. In addition, a representative number of personnel will be retained to provide service to the small customer and for miscellaneous requests.

Buildings and Grounds

Discussions were held with personnel in the Exponential Physics Unit in regard to the preliminary scoping of a new critical mass laboratory to be located in 300 Area. Landlord activities included the completion of a set of procedures to be followed in 328 and 325 Buildings in case of an enemy air attack. Meetings were held with the Project Section to discuss the scope and location of the proposed graphite fabrication facility. Project CG-576 - General Improvements to Laboratory Area Buildings showed design at 80% complete with construction 62% complete.

Drafting and Design

Total productive man-hours for the month was 2414 including 192 hours of overtime with an estimated backlog of 225 man days. As the large work load is considered to be a temporary situation assistance was requested from the Graphics and Design Groups. Work involving approximately 100 man-hours was shunted to the Graphics Group while the Design Group furnished a man on a loan basis.

Glass Shop

Total productive man-hours for the month was 1037 with practically no existing backlog. 109 jobs were completed including the fabrication of a twin spiral condenser for the 108-F Biology Group. The device was copied from a picture appearing in a German scientific magazine and is called a parallel still.

Photo Laboratory

In order to provide faster service to customers in the 300 Area, the Photo Unit is assigning an additional photographer to the area. This will benefit the Technology Sections as it is estimated that 95% of the photo work in 300 Area originates in the Technology Sections.

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CONTACT ENGINEERING UNIT -

The Design Section and other interested separations project personnel were informed of the design and testing by Separations Technology of a direct-reading iodine monitoring instrument for the detection of iodine gamma intensity in dissolver off-gas. The test facility is being installed at T-Plant. This information was transmitted for consideration in the current planning for iodine monitoring by caustic scrubbing methods.

A request was made to the Project Section for the installation of three gamma scintillation monitors on Purex intercycle feed streams and a concentration monitor on the plutonium evaporator effluent. These additions to plant scope have been included in a forthcoming project proposal revision.

Site preparation work has been started by Minor Construction for the prototype continuous calciner installation in 224-U Building.

INVENTIONS

All Separations Technology Section personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during June, 1955 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.

None

R. B. Richards

Manager, Separations Technology
ENGINEERING DEPARTMENT

RB Richards:khs

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MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

C. L. Edwards of the E. I. duPont deNemours Company, Wilmington, Delaware visited Hanford June 7th through 9th to investigate wobble meter design.

J. A. Morrison, L. G. Cook, E. J. Evans, R. J. Sage and W. M. Campbell of the Chalk River Plant, Canada visited Hanford June 13th through 15th for waste storage consultation.

D. E. Stephens of the Fischer & Porter Company, Hatboro, Pennsylvania visited Hanford June 15th through July 1, 1955 to provide assistance on high speed transcriber systems.

O. W. Priebe visited the Consolidated Western Steel Company, San Francisco, California May 31st through June 2nd to approve vendor's drawings for bubble cap tower.

E. P. Peabody visited the Bonneville Power Administration, Portland, Oregon June 3, 1955 to discuss details of future electrical board studies to be performed by BPA.

H. C. Ellsworth visited the General Electric Company, Schenectady, New York; Pittsfield, Massachusetts and Philadelphia, Pennsylvania June 5th through 13th to observe testing of 4500 HP synchronous motor pump drives for Project CG-558.

M. H. Russ visited the DeLaval Company, Trenton, New Jersey June 6th and 7th to witness pump motor tests.

M. W. Cook visited the University of California, Berkeley, California June 13th; the Dorr-Oliver Company, Oakland, California June 13th; the Shell Development Company, Emeryville, California June 14th; and the Mixing Equipment Company, Rochester, New York June 16th for consultation on agitation in waste tanks.

H. S. Davis visited the General Electric Company, Idaho Falls, Idaho and the Idaho Operations Office (A.E.C.), Idaho Falls June 14, 1955 to discuss barite and magnetite shielding structures.

L. M. Finch visited the Struthers-Wells Company, Warren, Pennsylvania June 12th to June 16th to approve vendor's drawing for the calciner.

C. A. Pursel visited the University of British Columbia, Vancouver, B.C., Canada June 17, 1955 to attend the Meeting of American Mathematical Association.

E. R. Rudock visited the Resistoflex Corporation, Belleville, New Jersey June 20th through 23rd; and the Allis Chalmers Company, Milwaukee, Wisconsin June 24, 1955 to discuss fabrication and testing of hose assembly.

L. C. Koke attended the ASME Boiler & Pressure Vessel Committee Meeting, San Francisco, California June 21st through June 24th to obtain information on latest revisions and interpretations of ASME Code.

E. J. Barrett attended the AIEE General Meeting, Swampscott, Massachusetts on June 25th through July 2, 1955.

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ORGANIZATION AND PERSONNEL

Personnel Statistics:	May 31 Exempt	May 31 Non-Exempt	May 31 Total	June 30 Exempt	June 30 Non-Exempt	June 30 Total
Design Management	2	1	3	2	1	3
Process Engineering Sub-Section	71	12	83	72	13	85
Design Planning Unit	17	14	31	17	14	31
Design Engineering Sub-Section	84	11	95	84	10	94
Design Drafting Unit	8	82	90	8	82	90
Total Section Personnel	182	120	302	183	120	303
Technical Graduates (Rotational)	-	4	4	-	5	5
Total	182	124	306	183	125	308

Accessions - 1
Separations - 5

GENERAL

Design Section engineering and drafting effort for June was distributed approximately as follows:

	Engineering Man Months Expended	Drafting Man Months Expended	% of Section Effort
Reactor Plant Modification for Increased Production	17.1	12.4	11.6
4-X Program	19.3	18.4	14.7
Design Development	78.0	20.4	40.1
Purex Plant Modifications	8.4	4.4	5.1
Other Design Projects	25.2	15.2	16.1
Customer Work and Miscellaneous	16.2	15.7	12.4
	164.2	86.5	100.0

*Equivalent man months expended included 138 hours of engineering and 55 hours of drafting overtime, which represents 0.4% of the Section based on the total available hours for a normal 40 hour week. Principal six-day work involved detailed design for the Metal Conversion Plant expansion.

The Design Drafting Unit production for June was 212 new drawings and 277 drawing revisions for an equivalent of 5.6 man days per drawing.

DESIGN DEVELOPMENT

Statistics:

The total number of engineering and drafting man months applied to design development activities during June were as follows:

	Engineering Man Months	Engineering % of Total	Drafting Man Months	Drafting % of Total
Metallurgical Design Development	3.2	4.1	0.2	1.0
Reactor Design Development	41.0	52.6	9.0	44.1
Separations Design Development	28.5	36.5	8.0	39.2
Chemical Processing & Reduction Design Development	2.3	3.0	0.9	4.4
234-5 Design Development	3.0	3.8	2.3	11.3
	78.0	100.0	20.4	100.0

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Metallurgical Design Development

Work on the problem of excessive noise level associated with the Fuel Element Plant semi-automatic cut-off machine continued during June. Trouble was experienced with fiberglass particles from the acoustical lining of the test enclosure being blown into the air in sufficient quantities to cause discomfort to machine operators. It is planned to spray the acoustical lining with a plastic material to eliminated the fiberglass dissemination.

The test program to determine optimum air flow requirements for ventilation of the 300 Area welding machines was conducted during the month. Air flows up to 100 cfm were achieved without causing disturbance to the argon gas shield. The increased exhaust air flow reduced welding booth temperatures approximately 5 to 10 degrees.

A study of the slug recovery process was initiated in order to evaluate means for reducing the operational costs of the process.

Reactor Design Development

Studies of methods of power generation from reactor effluent water at proposed outlet water temperatures of 248°F. were continued during the month. Several alternate combinations of flashing systems were reviewed and a two flash system with a generation capacity of 120,000 KW in two turbine generators was selected for further economic study.

Preliminary scope designs for the 100-C continuous-discharge facilities were modified to provide for a 100 tube demonstration unit in place of the full-pile installation originally planned for C reactor.

Further work was done on the evaluation of continuous charge-discharge facilities for the 100-K reactors.

The engineering feasibility study for the design of recirculating test loop facilities, at 100-DR was completed. These facilities, as proposed, would contain three high-pressure, high temperature water recirculation loops, each capable of operation following fuel element failure. These facilities are of a general purpose type suitable for performing test work for AEC contractors and Study Groups.

The program for development of improved process tube connectors for the 100-K reactors was completed during June. Tests were conducted with both stainless steel and teflon connectors. On the basis of these tests the teflon connectors were judged to have advantages from the standpoint of maintenance, ease of installation and resistance to rough treatment. An order was placed during June for sufficient teflon connector assemblies for replacement of the front face aluminum connectors on the 100-K reactors.

Studies were started on a new reactor plant to provide supplementary plutonium production at HAPO. These studies will be used as a basis for economic comparison of new plant construction with other means of increasing irradiation capacity such as pressurization and recirculation proposals for existing reactors.

The program for development of a zone temperature monitor system for existing reactor application progressed during the month. Vendor proposals on specifications for prototype equipment are expected early in July. The preparation of preliminary design scope has started and is scheduled for completion during July.

Other reactor instrument development items under study include proposed components for a process tube flow monitor system and the evaluation of resistance thermal detectors in the 100-K temperature monitoring systems.

Mechanical development items active during June included prototype process tube removal equipment, field testing of the hot ball separator, underwater automatic material handling equipment, process tube rupture detection equipment and alternate facilities for 100 Area dummy decontamination.

Separations Design Development

Preliminary scope studies of methods to provide facilities for additional plutonium separations capacity continued throughout the month. The coupling of higher anticipated HAPO reactor power levels (24,000 MW in 1961) together with a potential low exposure forecast (450 MWD per ton of uranium) would result in greater demands for separations capacity (up to 1400 tons of uranium per month). In addition, work continued on preliminary scope studies for a continuous dissolving facility to supplant the present Redox plant dissolvers and to increase the dissolving capacity of the Redox Area.

Scope designs were completed for facilities to promote circulation of liquid wastes in the underground waste storage tanks. Gas lift circulators were developed in order to eliminate the potential for excessive burping by continuous dissipation of superheat as it is formed.

The study for a Redox Plant Phase III capacity increase was continued. Preliminary review of major equipment capacities up to 400 tons of uranium per month shows that the crane becomes a capacity bottleneck at 200 tons per month and at 300 tons per month the dissolver system becomes borderline.

Progress continued on the preparation of preliminary scope for Purex Plant modifications. Scope was completed for silica gel facilities for tail end treatment of uranium and for back-up iodine removal facilities for the dissolver systems. These items were included in Project Proposal, Revision 9, for Purex Modification, Phase I which was completed during the month and submitted to the Financial Department for approval.

A study for improved iodine removal and nitric acid recovery facilities at Redox was completed. Preliminary scope designs were prepared for five alternates including (1) in-cell heaters and silver reactors for the dissolver system, (2) in-cell heaters and dissolvers for the vessel, condenser and nitrogen vent system, (3) outside heater and silver reactor, (4) outside heater and silver reactor combined with nitric acid recovery, and (5) a nitric acid recovery system followed by a caustic scrubber for both iodine and waste nitric oxide removal.

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Further investigations of methods for improving the Redox ventilation system are in progress. Several alternates for increasing ventilation flows are being studies in connection with the contamination control study.

A plant-wide survey was conducted in cooperation with the Advance Engineering Section to determine the extent of application of an analog computer at HAPO. Results of the survey were published in a document issued during the month.

Mechanical development studies which were active during June included in-line alpha monitor, specific gravity recorders for UO_3, column interface monitors for Purex, slug dejacketing, and improved agitators for separation processes.

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Chemical Processing and Reduction Design Development

Fabrication drawings for the spiral feeder-type continuous fluorination furnace were completed. These drawings were forwarded to vendors for their comments concerning a suitable vibrator to feed powder through the spiral.

A report was issued describing the method and feasibility of replacing Task II equipment with vertical furnaces similar to the Rocky Flats installations.

Preliminary scope designs were prepared to increase the power input of the Task III furnaces by approximately 50 per cent.

Reports were issued summarizing the development work performed on the Task III manipulators and testing of the Task III pressure vessel.

234-5 Design Development

Three preliminary scope drawings were issued for a remotely operated final shape machining lathe. Two alternate methods for collecting chips are included in the scope.

Development work for the Task XII conveyor system was completed.

Preliminary studies were started to investigate the application of ultrasonics to the cleaning and stripping processes of the metal fabrication line.

Engineering Standards and Material Development

Cost for development of engineering standards for the fiscal year is approximately $84,200.

Status of progress of standards and studies during June is as follows:

a. The following standards were completed:
   D-3-10 - Grounding Methods - Tables and Notes
   D-3-10a - Grounding Methods - Services, Panelboards and Feeders
   D-3-10b - Grounding Methods - Lighting and Small Power Loads
   D-3-10c - Grounding Methods - Power Loads
   HWS-8000-S, Standard Specification for Motor Control Centers, revised.

b. Extensive revisions are being made to existing standard specifications for austenitic stainless steels.

c. The preparation of a standard specification for electrical wire and cable advanced to 60% complete.

d. Preparation of "HWS-8005-S, Standard Specifications for Switchgear, 5 and 15 KV" was started.

e. The development of a Design Guide, "Welding of Miscellaneous Metals and Alloys", progressed to 90% complete.

f. The study of metal containers for shipping uranium was completed during the month and a report issued as HW-37174.

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DESIGN PROJECTS

Statistics

Engineering and drafting effort of the Section on project type activity for the month of June was as follows:

	Engineering		Drafting	
	Man Months	% of Total	Man Months	% of Total
Reactor Plant Modification for Increased Production	17.1	19.8	12.4	18.7
4-X Program	19.3	22.4	18.4	27.8
Purex Modifications	8.4	9.8	4.4	6.7
Other Design Projects	25.2	29.2	15.2	23.0
Customer Work and Miscellaneous	16.2	18.8	15.7	23.8
	86.2	100.0	66.1	100.0

CA-512- 100-K Area Facilities

Design activity for June included the preparation of construction as-built drawings and the processing of minor design revisions. A report on the 100-KE effluent water line failure was completed and issued.

Design of the 1706-KE Water Studies Semiworks including exceptions noted during inspection, was completed during the month.

Detailed design for the 1706-KER Facility, including plans and specifications, advanced to 100% complete as of the end of the month. Purchase orders for the major portion of the control valves were reviewed with vendor representatives to arrange for alterations due to design revisions.

CA-513 - Purex Separations Facility

Design assistance was furnished to the field in preparation for pre-start-up activities.

Design of the 216-A-8 condensate and cooling water crib was completed during the month and design for the 216-A-10 crib advanced to 95% complete.

CA-514 - 300 Area Expansion

Design activity was limited to the preparation of drawings for the installation of the existing filter press in the fuel element recovery area. Recommendations were furnished by Design representatives for repainting certain proecess equipment.

CA-539 - Additional Waste Storage Facilities - Redox

Status of detailed design for Project Proposal Revision No. 5 and 6 is as follows:

Part A - Design 100% complete.

Part B - Design for the emergency water facility advanced to 90% complete.

Part C - Design 100% complete.

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CA-546 - Fuel Element Pilot Plant

Total design progress for the project is 74% complete. Detailed design of the development equipment for the Fuel Element Pilot Plant advanced to 94% complete. The drawings for the equipment installation are 79% complete. Piping and ventilation design for the plating room, fixed development, and development line areas is virtually complete. Specifications and revised drawings for the electro-plating room work are being prepared to provide for lump sum construction.

CG-558 - Reactor Plant Modification for Increased Production

Total design advanced on schedule to 85% complete, an increase of 4% during June. Design scope is complete and detailed design 82% complete. A revised project proposal for Phase II, 100-F and H Areas was prepared and submitted to HOO-AEC for approval. Detailed design is well advanced for the 190 Annex Buildings, 183 Building modifications (filter plants) and the 181 Buildings (river pump houses). The principal remaing design work involves the 105 Buildings and 151 Sub-Stations. Progress on these two phases of design was limited during the month pending receipt of vendor information. Considerable design effort was expended during June on the review of vendor bids for engineered equipment and the review and approval of vendor drawings.

Testing of the 4500 HP synchronous motors for the process pumps, conducted at the vendor's plant, was witnessed by Design representatives.

CG-578 - Effluent Water Monitoring Improvements, 100-B, D, DR, F and H Areas

The detailed plans and specifications for this project were completed during June. Remaining design items include review of vendor drawings and design field liaison in support of equipment installation.

CG-579 - Effluent Water Monitoring Improvements, 100-C Area

The detailed design advanced to 98% complete. Final completion of detailed plans and specifications is dependent on the receipt of certified vendor information.

CG-586 - First Capacity Increase - 230 KV System

Detailed design for additions to the 230 KV system advanced to 65%. The delay in receipt of approved vendor drawings has slowed up the preparation of detailed plans.

CG-598 - Purex Vacuum Fractionator

General Electric design for the project advanced to 96% complete. Remaining design work is principally instrument drawings.

CG-600 - Hanford 4-X Program, 100 Areas

Design progress at the end of June was 93% complete. A revised project proposal requesting additional funds for the revised project scope was prepared and is scheduled for submission to HOO-AEC in July.

CG-603 - Hanford 4-X Program - Bismuth Phosphate Plants

Detailed design is 97% complete. Progress is based on the revised schedule which includes additional drawings for the in-farm waste scavenging tanks and the experimental continuous pH sampler.

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CA-612 - Alterations of 713 Building for Electronic Data Processing Machine

Design activity was limited to assistance furnished in support of equipment installation and testing.

CG-613 - Hanford 4-X Program - Metal Conversion Plant

Detailed design for the UO_3 Plant expansion advanced 20% during June to 73%. Design for the 224-UA (new annex) was altered during June to provide for lump sum construction of Phase III which includes placement of equipment, piping, wiring and the exhaust ventilation system. A revised design schedule to include the additional design work is being prepared. Detailed design for the continuous calciner was completed during the month.

CG-614 - Hanford 4-X Program - 300 Area

Detailed design advanced to 99% complete. Detailed drawings for the ventilation system for the recovery furnaces are being held up pending development of a satisfactory system for the furnaces installed as part of Project CG-514.

CG-616 - Installation of Acid Feed Equipment, 100-B, C, D, DR, F and H Areas

Design activity during June was limited to design scope and preliminary design. Detailed design is scheduled to start July 1, 1955.

CG-621 - Redox Contamination Control Facilities

Detailed design for the In-Cell Ozonization advanced to 96% complete. Other design items now awaiting A.E.C. authorization include canyon wash-down facilities, pre-cycle jumpers, improvements to the vessel vent system, disposal of contaminated equipment and a pre-condenser for the J-6 vent system.

CG-624 - Redox Railroad Tunnel Ventilation Barrier

Detailed design which was initiated during June, is 5% complete.

CG-625 - Additional Waste Disposal Facilities - 200 Areas

Design for Phase I, which includes an eight tank farm addition to the existing 241-SX Tank Farm, advanced to 90% complete. As a result of a Manufacturing Department study, the required date for Phase I tanks was extended and the design schedule was revised during June.

CG-626 - Alterations to Redox Inert Gas System

Detailed design advanced to 6% complete. A drawing schedule for 32 required drawings was prepared and issued. Material procurement has started.

CG-631 - Crib Replacement Facilities - 241-T Tank Farm

Authorization for design of these facilities was received from HOO-AEC during the latter part of the month. Schedules are currently being prepared and design is expected to start July 1st.

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D. O. 100757 - "As-Built" Area Maps

At the end of June, 348 drawings were completed or in progress out of a total of 375 scheduled.

D. O. 101063 - Alum Activated Silica Water Treatment Facility, Phase II

During the month a rough draft project proposal was prepared and issued for comment.

D. O. 101218 - General Improvements to Laboratory Area Buildings (CG-576)

Detailed design advanced during the month to 95% complete.

D. O. 101249 - Gage for MEF Slug Breaker, 105-C

Design work is complete for the installation of a stress-strain gage on the 105-C MEF slug breaker. Completion of installation, testing and calibration will be accomplished upon receipt of materials.

D. O. 101283 - Building 327 - Cell for Tensile Testing Machine (CG-576)

There was no design activity on this project during June pending receipt of vendor shop drawings. Total design remains at 90% complete.

D. O. 101287 - Redox Stack Particulate Sampler - Project Proposal

A project proposal for the installation of an improved particulate sampler for the Redox ventilation stack was completed during the month and issued for Radiological Sciences Department approval.

D. O. 101289 - Crib Replacement - 200 West Area (CG-634) - Project Proposal

A project proposal for replacement of Redox 216 S-1 and 2 Crib was completed and issued to HOO-AEC for approval during the month.

D. O. 101331 - Additional Service Facilities - Redox Plant - Project Proposal

A project proposal covering additional service facilities for the Redox Plant was completed during June and issued for Manufacturing Department approval.

D. O. 101367 - Relocation of Grove Valve Impulse Lines - 100 Areas

Preliminary scope investigation was carried out during June in advance of preparation of scope drawings for relocation of Grove valve impulse lines and control valves at 105-B, C, DR, F and H.

D. O. 101378 - TBP Plant - Augmented Intercycle Stripping - Project Proposal

A project proposal was started in June covering the conversion of Section 9, 221-U, to an intercycle concentration section.

D. O. 101380 - Shielded Personnel Monitoring Station - Project Proposal

Work was started during the month on a project proposal for the provision of a shielded personnel monitoring station for the Radiological Sciences Department.

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D. O. 101398 - Feasibility Study - Dummy Decontamination - 100 Areas

During June, an investigation was started of the feasibility and economics of alternate methods for decontamination of aluminum dummies used in the 105 Buildings.

D. O. 101399 - Modifications to Industrial Medical Facilities - Kadlec Hospital

Project proposal preparation was started during June covering modifications to Industrial Medical facilities at Kadlec Hospital.

Design Work Completed During June

D. O. 101036	Moisture Monitoring System, 105-C Building (CG-584)
D. O. 101045	Discharge Area Television Viewer, 105-B Building (CG-593)
D. O. 101178	Evaporator & 6-4 Tower, 221-U Building
D. O. 101212	Classified Scrap Disposal
D. O. 101229	234-5 Building As-Builts
D. O. 101301	Redox Plant - Revision of Jumper Drawings
D. O. 101324	Hardness Positioner for 327 Building - Drafting Services
D. O. 101325	Redox Plant - Scope Design for Additional Service Facilities
D. O. 101332	"U" Plant - Waste Swamp Overflow
D. O. 101336	Glove Boxes for Retaining Animals
D. O. 101337	Irrigation System - Experimental Grass Plot - 100-F
D. O. 101341	"U" Plant - Condenser Drawings
D. O. 101361	Water Plant Component Test Loop - Scope Design

INVENTIONS

All persons in the Design Section 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:

Inventor	Subject
C. A. Pursel	A process system and plant arrangement for the irradiation of food from irradiated reactor fuel elements.
E. R. Astley	An inert, stress-free, high conductivity uranium oxide fuel.
G. A. Newell	Fuel charging machine for use during pile operation.
C. E. Bonham	Special controlled column discharging equipment.
M. W. Cook	Application of Gas lift circulators in waste tanks.
E. Hollister	Portable reactor for use in the bottom of an oil well for pumping purposes.

RH Beaton

Manager - Design
ENGINEERING DEPARTMENT

RH Beaton:HDT:md

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DESIGN SECTION ORK STATUS

ENGINEERING . MONTHS

PROCESS ENGINEERING SUB-SECTION

Description	Backlog Start of Mo.	Work Sch'd Dur. Mo.	Time Spent Dur. Mo.	% of Total Effort	Backlog End of Month	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Bal. of FY 1956 & Later	Total
1952 Exp. Program*	46.1	10.0	7.1	10.0	49.0	7	7	6	6	5	4	14.0	49.0
CG-558 & CG-600	12.8	8.0	2.4	3.4	18.4	2	2	2	2	2	2	6.4	18.4
4-X Program	24.2		2.6	3.7	21.6	2	2	2	2	2	1	10.6	21.6
Reactor Design Dev.	30.6		32.2	45.3	312.0	30	29	28	26	26	26	147.0	312.0
Separation Design Dev.	20.1		20.5	28.8	240.0	21	20	19	19	19	19	123.0	240.0
Met. Design Development	2.0		2.5	3.5	30.0	2	2	2	2	2	2	18.0	30.0
234-5 Design Development	6.3		1.1	1.5	18.0	1	1	1	1	1	1	12.0	18.0
Weapons Design Dev.	2.9		1.1	1.5	12.0	1	1	1	1	1	1	6.0	12.0
Other Proj. & Misc.	4.7	5.0	1.6	2.3	8.1	3	3	3	3	3	4	30.0**	50.0
Ant. Future Work						2	4	6	7	8	8	73.0	108.0
Totals	149.7	23.0	71.1	100.0	709.1	71	71	70	69	69	68	440.0	859.0

DESIGN ENGINEERING SUB-SECTION

1952 Exp. Program*	53.6	43.3	11.9	15.2	85.0	12	11	11	11	11	9	20.0	85.0
CG-558 & CG-600	177.6		13.1	16.7	164.5	13	13	12	12	11	10	93.5	171.6
CG-586	13.1		1.4	1.8	11.7	1	1	1	1	1		6.7	11.7
CG-598	13.1		2.3	2.9	10.8	2	2	1	1			4.8	10.8
CG-616		20.0	0.1	0.1	19.9	1	3	3	3	2	1	6.9	19.9
CG-621	11.9		0.8	1.0	11.1	2	1	1				7.1	11.1
CG-624	2.0		0.1	0.1	1.9	1	1	1					1.9
CA-625	42.9		3.3	4.2	39.6	3	3	3	3	3	3	21.6	39.6
CG-626	5.0		0.6	.8	4.4	2	1	1				.4	4.4
CG-631		6.0			6.0	1	1	1				3.0	6.0
4-X Program	36.6	36.0	15.6	20.0	57.0	13	11	9	6	4	4	10.0	47.0
Design Dev. Program	16.2		14.3	18.2	168.0	13	14	14	14	14	14	85.0	168.0
Other Maj. Minor, Misc.	71.9	32.0	14.9	19.0	89.0	10	9	10	11	10	10	29.0	89.0
Ant. Future Work						5	9	13	18	23	28	252.0	349.0
Totals	443.9	137.3	78.4	100.0	668.9	79	80	80	80	79	79	539.7	1024.8

Present total backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Work FY 1956	Anticipated Future FY 1956	Totals
Arch. & Civil	140	50	190
Mechanical	208	124	332
Electrical	112	72	184
Instrument	152	81	233
Standards	57	29	86
Totals	669***	356****	1025

*Includes 1706-KER and Purex Capacity Increase

**Includes Minor & Miscellaneous work Budgeted for FY 1956

***Includes Design Development [illegible] scheduled work for Purex Capacity Increase & 4X Program

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I. SUMMARY

A. Organization and Personnel

Following is a summary of personnel changes in Project Section during the month:

	May 31, 1955	June 30, 1955	Net Change
Employees on payroll	347	343	-4
Technical Graduates, Rotational	1	2	+1

The end-of-month status involved these changes:

	Project Section	Technical Graduates Rotational
Payroll additions	4	0
Payroll removals	7	0
Transfers into Section	2	2
Transfers from Section	3	1
Transfers within Section	2	0

B. Scope of Activities

At the end of the month major construction completion status was as follows:

Project No.	Title	Completion Scheduled	Completion Actual
CA-512	100-K Area Facilities (excluding 1706-KER construction which has not been scheduled)	100%	100%*
CA-513-A	Purex Facilities, Part A	100%	100%**
CA-514	300 Area Expansion	97%	100%***
CA-539	Additional Waste Storage Facilities, Redox	78%	78%
CA-546	Fuel Element Pilot Plant	55%	55%
CG-558	Reactor Plant Modifications	14%	11%
CG-603	Hanford 4X, Bismuth Phosphate Plants	42%	70%

* Complete except for clean-up and start-up items.
** Complete except for start-up and design changes.
*** Complete with exceptions.

C. Craft Labor

The strike on May 24, 1955, by 78 operating engineers was resolved by the middle of June. Some operators resumed work on June 8, and the remainder returned by June 13. Conditions of the settlement were essentially the same as established by the contractor just before the strike. If available on the job, operating engineers are to start the compressors; otherwise, another craft on the job will operate them.

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D. Safety and Security

Seven regular meetings for discussions of safety, security, and health topics were attended by about 185 Project Section employees. Four Monday-morning tool box and four mass safety meetings were conducted in the field for service contractor personnel. Three Special Hazards orientations were given to a total of 91 new and rehired employees. Good radiation control was maintained in all construction areas. Project Section has operated five consecutive months without a security violation.

E. Highlights

Project Auxiliaries Section

The total of exempt personnel available for transfer has been reduced to three. A final draft of the estimating procedure was prepared for issue. Property evaluation work was completed on five projects, and work was continued on four major projects. Reproduction output decreased slightly to a total of 363,906 square feet. Engineering Files distributed about 149,000 prints, including about 5,200 classified items. The largest orders for reproduction and distribution were 7,528 prints for Reactor Plant Modification and 6,307 prints for the 1706-KER Recirculation Facility. Estimating completed 34 estimates, including 14 to be used with project proposals.

Field Surveys continued with assistance on equipment alignment, layout data, and other services in the field. The Unit continued with revisions to plats of Richland, Washington.

Inspection Sub-Section

The total inspection workload increased to about 550 orders, of which 458 had been assigned to inspectors. Evaluations under the Corrosion Testing Program declined slightly to 132 corrosion tests, 63 chemical determinations, and nine oxalic acid etch tests. Criteria and procedures have been established for inspection by one of the following: (1) General Electric off-site, (2) government agencies off-site, or (3) General Electric at HAPO. An on-site vendor inspection staff is being formed. Several problems surrounding process water pumps have received close attention, as have orders for front face connectors, venturis, and other reactor components. An order was placed for continuous calciners for the enlargement of Metal Conversion Facilities; other large orders to be placed soon include replacement concentrators and vacuum acid fractionators for Purex, and Teflon connectors for K-Area reactors.

Minor Construction Sub-Section

The Sub-Section was engaged in more than 100 work orders and project items which represent total authorizations of about $15,400,000. The total manpower ceiling for service contractor personnel has been raised from 1,000 to 1,150, and a request has been made for a new ceiling of 1,300 to meet requirements of Purex and Reactor Plant Modification projects. During the month, Minor Construction forces completed assignments on 38 work orders and three project items. New work received includes 67 work orders and three project items. Following nine months of operation, the Minor Construction Miscellaneous Stores has lowered its expense liquidation rate to 17% of material disbursements.

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Project Engineering Sub-Section

Work was done on 39 projects, four informal requests, and miscellaneous engineering requests. The Sub-Section completed assigned work on 300 Area Production Facilities, with exceptions covered by work orders. Also, work was completed on the Official Telephone Exchange, the "U" Swamp Crib, and one engineering request. Intial work was accepted on CG-626, Alteration to Redox Inert Gas Vent System, and four engineering requests. A survey was made of project funds committed to plant forces by work orders. Between November 26, 1954, and June 30, 1955, $1,129,097 was committed on 283 work order requests. On June 15 the contract was awarded for construction of the 190-DR Building Annex for $665,800. Important projects now in progress include 100-K Area, Redox Waste Storage, Fuel Element Pilot Plant, Reactor Plant Modifications, Effluent Water Monitoring, and the Hanford 4X Program.

Separations Sub-Section

Work at Purex Facilities has now been divided into three parts: design changes and operability tests, the railroad tunnel, and the 2.75 factor capacity increase. Initial operability testing was continued toward scheduled completion during July 1955. Of a total of 84 Acceptance Test Procedures, 66 have been completed. The remainder apply to 241-A Waste Storage, canyon heating and ventilating systems, control rooms, and building services. Work on design changes proceeded under interim authorizations from AEC. Bids for the railroad tunnel were opened on June 28, and the apparent low bid was $248,295 compared with the fair cost estimate of $248,968. Minor Construction has started the work to be done before the contractor moves in. A project proposal for the Purex capacity increase, requesting $3,100,000, is being routed for approvals.

F. Monthly Report of Inventions and Discoveries

All persons in Project Section 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.

None.

J. S. McMahon, Manager, Projects

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II. STATISTICAL AND GENERAL

A. Significant Assignments

1. Initial Reporting

CA-626, Alterations to Redox Inert Gas Vent System

The total estimated cost was $115,000, and the directive completion date was April 1, 1956. Preliminary and detailed design are being managed by Design Section. Procurement and construction must await further design work.

ER 2763, Redox Service Facilities Expansion

A project proposal for estimated cost of $245,000 is being prepared by Design Section.

ER 2764, 2101 Building Conversion

At the request of Manufacturing Department, Separations Section, a project proposal is being prepared for conversion of the 2101 Building.

ER 2765, Redox Stack Particulate Sampler

A project proposal for a total estimated cost of $50,000 is being prepared by Design Section.

ER 2766, 221-U, Section 9, Conversion to Intercycle Concentration

A project proposal is being prepared by Design Section.

2. Final Reporting

CA-514, 300 Area Expansion Program, Production Facilities

This project was closed out as scheduled on June 15, 1955. Approximately 25 work orders, representing about 3% of the original project work and $255,000, were issued for completion of clean-up items.

CA-533, Hanford Works Official Telephone Exchange

Construction progressed 2% to completion. The telephone exchange was placed into operation as scheduled on June 17, 1955. Changes of telephone numbers and delivery of new directories were completed on June 18, 1955. Information for the physical completion notice is being assembled.

Job. No. 0048, Increase Cribbing Capacity, "U" Swamp

The project was completed and accepted without exception on June 14, 1955. Information for the physical completion notice is being assembled.

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ER A-3114, Relocate Oxide Burner North of Building 314

At the request of Engineering Department, the preparation of an informal request was closed out.

3. Current Projects

CA-512, 100-K Reactor Facilities

Completion status remained at design 100%, construction 100%.* Good progress was made by Minor Construction and plant forces on clearance of clean-up items. Preparatory work has been done for repair of existing roads and addition of new roads to the area. Temporary construction facilities are being cleared from the 100-K Area and the special equipment to be held for future use has been inventoried and verified. On June 2, 1955, certain major tools, lathes, pipe benders, cranes, and punch presses were released to Purchasing and Stores.

A purchase order has been placed with the Resistaflex Corporation for 7,000 Teflon-braided connectors to be used on the front face of both 100-K reactors. Delivery for one reactor was promised by August 26 or earlier, and for the second reactor by September 6, 1955. The Teflon connectors are undergoing operating tests. The project proposal is being prepared to request additional funds for completion of modifications and accomplishment of design changes. This proposal itemizes about 27 items representing more than $2,000,000.

Detailed design of the 1706-KER Recirculation Facilities was completed during the month. Late design changes were incorporated in the final drawings. Construction work was resumed on June 15, 1955, and it included installation of vent lines and other service piping. Slow delivery of materials, particularly valves for the loop piping, is delaying installation. Some temporary installations are being made to alleviate shortages of electrical and piping materials.

CA-513-A, Purex Facility

With design and construction as originally planned essentially completed, the principal emphasis was on operability testing and accomplishment of design changes. This work was proceeding on an additional interim authorization of $500,000.

The present schedule indicates completion by the middle of July 1955. A second part of the work was concerned with the railroad tunnel, and bids for this item were opened June 28. Minor Construction forces have started the necessary work before the contractor moves in.

The project proposal for the 2.75 factor capacity increase of Purex is being routed for approvals. The estimated cost was $3,000,000, which includes $1,000,000 for a complete new crane.

Of the 84 acceptance test procedures required, 66 have been completed. Of the 18 remaining, eight apply to the concentrator facility of the 241-A Waste Storage. The remaining ten apply to heating and ventilating systems, control rooms, and building services.

* Completed with exceptions of clean-up and start-up items.

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CA-539, Additional Waste Storage Facilities for Redox

Design had been completed previously; construction progressed 10% to a total of 78%. The contractor completed the 24-inch vapor lines and backfill. Instrument tubing is being installed.

Concrete was placed for the condenser house, and the concrete work and safety water seal were completed in Tank 106. Preparatory work was accomplished for fabrication of the valve jumpers and installation of filter media. The tygon-lined tanks were moved to 241-SX Tank Farm.

CA-546, Fuel Element Pilot Plant

Overall design progressed 3% to a total of 68%; construction progressed 5% to a total of 55%.

The AEC approved Revision No. 3 to the project proposal with the reservation that construction of second-floor offices was to be done by fixed fee contractor. Construction schedules are being revised to reflect this change, and the AEC was informed that $40,000 was included in the project estimate for construction of these offices.

The 400-ton hot press unit has been transferred from the 328 Building. Instruments and piping are being installed.

CG-558, Reactor Plant Modification for Increased Production

Design progressed 4% to a total of 82%; construction progressed 2% to a total of 11%.

The AEC approval of Revision No. 4 to the project proposal has caused this project to be divided into Phase I and Phase II. The principal changes were deletion of all water plant work in 100-F and 100-H Areas, and substitution of Panellit gauge replacement and backup instrumentation.

The major material problems are centered on process water pumps, venturis, and heavy-walled 18-inch piping. The model process water pump was tested and was operated satisfactorily. The Everett Foundry was obliged to make repairs on practically all castings. The De Laval Company was in the early stages of machining the castings. Several carloads of pump drive equipment have been delivered to HAPO.

The shutdown schedule for replacement of horizontal rods has been established as follows:

	Starting Date	Duration
100-D	June 27, 1955	Two weeks
100-B	July 11, 1955	Three weeks
100-H	August 1, 1955	Two weeks

A revised official schedule has been submitted to AEC.

Bids for the lump sum work at 100-DR were opened June 28. The low bid was $665,000, compared with a fair cost estimate of $643,000.

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In 100-D Area the new #4 900-HP pump is being installed. Related piping and electrical services were being placed. Rough excavation for the 190-D Annex was essentially completed.

Extensive work was done in all areas on electrical services, piping, and service connections.

In 100-B Area, construction consisted of finished excavation, placement of concrete for foundations and building walls, installation of conduit, and relocation of underground lines.

CG-603, Hanford 4X Program, Bismuth Phosphate Plants

Design progressed to a total of 97%; construction progressed 13% to a total of 70%. The AEC directive on June 30, 1955, authorized the total requested funds of $5,300,000. The first cycle waste scavenging work in 241-TX Tank Farm was essentially completed. The repair program was continued as materials were delivered. The four-inch piping requested for the 200-East cross-country line arrived on June 21, 1955.

Fabrication of new jumpers was completed with exception of possible replacements for defective old jumpers.

Work at 211-T Tank Farm has been completed.

Four new pumps were installed at 241-CR, and three pumps are being replaced at 241-BY.

CG-613, Hanford 4X Program, Metal Conversion Plant

Scoping and design are being managed by Design Section. Design work progressed 20% to a total of 73%. Shop drawings for the calciners have been tentatively approved. Fabrication can begin in early July if enough acceptable material is available. Considerable attention has been given to corrosion testing of stainless steel to be used. The complete bid package for foundations was transmitted to AEC on June 21, 1955, and the bid opening was scheduled for July 15, 1955.

On June 22, 1955, Minor Construction forces began relocation of existing underground lines and site preparation work.

B. Other Assignments

CA-548, Reactivated Project Proposal for New VSR Test Tower

With preliminary design completed the project proposal is being routed for General Electric approvals.

CA-555, Graphite Hot Shop and Storage Building

Design progressed 7% to completion; construction began and progressed to 2% complete. Completed design and construction specifications were forwarded to AEC for preparation for a fixed fee bid assembly. Construction began on the 3730 Building on June 3, 1955, with the erection of a stud wall and sheetrock partition in the existing building Demolition is being delayed until bids have been received.

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CG-572, Particle Problem Animal Exposure Equipment

Completion status remained at design 100%, construction 32%. Procurement activities were continued. The start of construction was scheduled July 5, 1955.

CG-574, Irradiation

Completion status remained at design 100%, construction 99%. A yoke to handle the "N" metal orders is being designed so that all of the handling equipment can be tested.

CG-576, General Improvements to Laboratory Area, 300 Area

Design progressed 5% to a total of 80%; construction progressed 6% to a total of 62%.

A revision to the project proposal was prepared to request permission to combine the paving around the 329 Building with miscellaneous paving in the city of Richland. The invitation for bids was dated June 3, 1955.

Material procurement was started for Minor Construction work on 328 Building, and for the 327 Building emergency exit. A new work order has been issued to plant forces for installation of supplementary fire detectors in the 329 Building. Work was started on installation of portable emergency lights in 329 Building. Materials are being procured for the cell exhaust system flow indicators in 327 Building, and bids were received for the tensile machine shielding cell for 328 Building.

CG-578, Effluent Water Monitoring Improvements, 100-B, D, F, DR, and H Areas

Design had been completed previously; construction progressed 3% to a total of 14%.

The gamma monitoring equipment in 105-H Building was scheduled to be installed concurrently with the Panellit shutdown on August 1, 1955. The first three spectrometer assemblies have been tested in the shop and the other two are scheduled for completion by July 8, 1955. Shop wiring of panels of the 105-DR sample room was completed.

CG-579, Effluent Water Monitoring Improvements, 100-C Area

Scoping and design services are being managed by the Design Section. Because of work on Project CG-578, there was no actual construction start-up on this project.

CA-586, First Capacity Increase, 230-KV System

Design progressed 8% to a total of 65%. The target date for completion of requisitions was revised to July 1, 1955. This delay was caused by a design change to a tap structure which involved transmission line hardware and a conductor.

CG-587, TBP Waste Scavenging

Completion status remained at design 100%, construction 98%. The Design Section is preparing a revised project proposal for installing chemical make-up facilities for a third chemical for the scavenging process. With the exception of one well, the U. S. Geological Survey has completed its portion of the project.

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CG-589, Dejacketing and Ultrasonic Equipment, 105-C Building

Design had been completed previously; construction progressed 3% to a total of 18%. Minor Construction work was delayed by a strike of the operating engineers and the lack of excavation equipment; however, this is not expected to delay physical completion of the project. A revised construction schedule is being prepared to reflect greater delays caused by slow material delivery.

CA-590, Fly Ash Collection Equipment, Building 384

With preliminary design completed the project proposal has been returned unapproved by AEC. The Metal Preparation Section is revising the justification before re-submitting the proposal.

CA-595, Car Pullers, 184 Building Coal Yard, 100-B, D, F, and H Areas

With both design and construction complete, necessary work orders and requisitions are being prepared for performance of minor modifications recently authorized by AEC. Following completion of these exceptions, the project is to be closed out.

CA-596, Central Mask Washing Station, Building 2723-W

Field work was about 50% complete. Site preparation work has been completed by Minor Construction with the exception of steam supply piping and PRV rework.

CG-598, Purex Acid Fractionator

Design progressed 13% to a total of 97%. Minor Construction work was about 15% complete. Excavation for the project was started on June 16, and the first concrete footing was placed on June 22. The changes in "F" Cell required by the fractionator are almost complete.

Negotiations for a fabrication contract were completed with the Lummus Company, designer of the acid fractionator. A revision to the project proposal has been delayed to await outcome of these negotiations.

CG-599, Hanford 4X Program, 100 Areas

Scoping and design are being managed by Design Section. The project scoping was approved by AEC, and a revised project proposal is being prepared by Design Section to incorporate the changes.

CG-600, 100-C Alterations

Design progressed 6% to a total of 93%. Construction remained at .3% complete, and installation work is to be resumed in November 1955.

CA-601, 300 Area General Improvement Program

With preliminary design 85% complete, the project proposal is still awaiting authorization by AEC.

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CG-608, Redox Crane Viewing Room

Design had been completed previously; construction progressed 10% to a total of 75%. An exhaust fan has been installed for temporary ventilation facilities, and beneficial use of the room was achieved on June 6, 1955. The remaining work consists of installing the new fan and making some changes in the accompanying duct work.

CG-610, Replacement of 313 Building Roof

Design had been completed previously; construction began and progressed to 20% complete. Field work was started on June 15, 1955. Removal of the old roof is being performed under SWP conditions.

CG-611, Mobile Laboratory

With preliminary design complete, the project proposal is still being reconsidered by AEC.

CG-612, Alteration of 713 Building for Electronic Data Processing Machine

Scoping and design are being managed by Design Section. Construction progressed 15% to completion. Final inspection of lump sum contract work was held on June 15, 1955, and all contract exceptions were cleared on the same day. A few minor refinements on the ventilation system must be done in order to maintain the required control of temperature and humidity. A work authority dated June 22, 1955, authorized General Electric $66,000.

The "702" Electronic Data Processing Machine equipment arrived on June 6, 1955. Since that date IBM engineers have been setting up and performing pre-operability tests.

CG-614, Hanford 4X Program, 300 Area

Scoping and design are being managed by Design Section. Authority was received from AEC on June 14, 1955, for starting construction with the $130,000 now authorized. Procurement of engineered material progressed according to schedule.

CA-615, Mechanical Maintenance Shop Centralization, 100 Areas

With preliminary design completed, further work must await decisions by Manufacturing Department.

CG-616, Installation of Acid Feed Equipment, 100-B, C, D, DR, F, and H Areas

The project proposal is being prepared by the Design Section. Since it has been determined that most of this work can be performed by a fixed fee contractor, the project proposal is being revised accordingly. By Directive HW-349, Modification #1, dated June 20, 1955, the General Electric Company was authorized $185,000.

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CG-617, Additional Air-drying Facilities, Building 234-5

Design is being managed by Design Section. The final electrical tracing was completed on June 17, 1955. The final estimate is being processed before issuing a work release to Minor Construction.

CA-619, Alterations to 186-D Building

The project proposal which was transmitted to AEC on March 10, 1955, was returned unapproved on June 20, 1955.

CG-620, Melt Plant Modifications, 314 Building

Detailed design progressed 5% to a total of 60%. Results of the "Hot-top" tests have indicated that more electrical power is required. A meeting was scheduled to establish a firm scope for completion of design.

CG-621, Redox Contamination Control Facilities

Scope and design are being managed by Design Section, and design was 96% complete. Although not scheduled, construction began and progressed to 2% complete. Minor Construction shops have completed work on the vessels except for hydrostatic testing. Plant forces proceeded with jumper fabrication toward a scheduled completion of July 15, 1955. Installation of cold-side piping and equipment was scheduled for completion in early August 1955.

CG-624, Redox Railroad Tunnel Ventilation Barrier

Scoping and design are being managed by Design Section. Construction is awaiting completion of detailed design and procurement.

CA-625, Additional Waste Disposal Facilities, 200 Area

Scoping and design are being managed by Design Section. The project proposal, to request construction funds, is being delayed until Manufacturing Department completes a review of the required beneficial use date for the Phase I tanks. The revised design schedule was approved by AEC. Specifications advanced 25% to a total of 65%.

CA-627, Replacement of 300 Area Fence

Bids were opened on June 21, and the apparent low bid was $11,943, compared with an AEC fair cost estimate of $13,000.

CA-633 (ER 3120), Remodeling of Facilities, Kadlec Hospital

The Industrial Medical Sub-Section requested deletion of the fire sprinkler system and the reception room alterations. The final draft of the project proposal, changed in accordance with this request, is being routed for approvals.

IR-183, Study of Classified Scrap Disposal Problem, 300 Area Library

Detailed design progressed 35% to completion. The AEC was requested by letter on June 10, 1955, to obtain a lump sum contractor for earthwork and paving. On June 20,

1955, a work release for $3,500 was issued to Minor Construction for installation of the disposal machine and removal of the existing incinerator.

IR-184, Expansion of Facility for Testing Fuel Elements by Induction Heating, 314 Building

Design had been completed previously; construction progressed 2% to a total of 99%. Balancing of the heating coil tank circuits on induction heating work stations Nos. 1 and 2 has been completed. Station No. 3 was essentially completed, and final acceptance of the facility was scheduled for early July 1955.

IR-191 (ER 3117), 321 Building Fire Protection and Staging Study

The AEC returned the informal request on June 9, with the request for additional scoping. The revised request is being routed for approvals within General Electric Company.

IR-196, Surfacing Roads and Parking Areas, Minor Construction, White Bluffs

The informal request for $15,500 was approved by AEC on June 7, 1955. The paving was included in a lump sum contract. General Electric Company was authorized $6,200 for design, field engineering, and stabilization of parking areas.

* * * * * * * *

The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month:

ER 761, Decontamination Facilities, First Aid Station, 100-H and 200-W Areas

Work was delayed pending action by the Industrial Medical Sub-Section.

ER 765, Painting Water Plant Structures, 100-DR Area

The final draft of the project proposal is being prepared for signature during early July 1955.

ER 1219, 105-KW Laboratory

A revised rough draft of the project proposal is being routed for comments.

ER 1220, Minor Construction Fabrication Shops Modifications

The revised project proposal is being routed for General Electric approvals.

ER 1221, Modifications to 105 Transfer Areas

A letter has been written to AEC recommending that the two replacement cask cars, of the proper length, be procured to permit usage in the existing transfer areas.

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ER 1224, 100-DR Recirculation Test Facilities

The Design Section is proposing a study report for installation of three loops in 105-DR.

ER 1225, Continuous Charge-discharge Facility at 105-C

The project proposal is being prepared by Design Section.

ER 1227, Provide Additional Storage and Shop Space in the 105-B, D, and F Buildings

Work was postponed to await additional justification from Manufacturing Department.

ER 1229, Installation of Raw Water Cross-tie, 105-C

Preparation of the informal request was delayed by higher priority work.

ER 2756, FY-1955 Water Tank Replacements, 100-200 Areas

The project proposal for an estimated cost of $115,000 is still being reviewed. The question of forces to be used for work in the 184 Building has been resolved.

ER 2762, Multi-purpose Wind Tunnel

The project proposal is being prepared by Design Section, and it is being routed for final General Electric approvals.

ER 3122, Replacement of Steam Plant Deaerator, 384 Building

Additional justification was received from the Manufacturing Department, and final draft of the project proposal is being prepared.

C. Related Functions

Inspection workload increased substantially, due in part to placement of the continuous calciner order. The numerical increase of orders requiring inspection was about 11%, to a total of about 550. The Corrosion Testing Program included 132 corrosion tests, 63 chemical determinations, and nine oxalic acid etch tests.

Considerable attention was given to formation of an on-site vendor inspection group, and this task was essentially completed. The on-site inspectors will handle all items of engineered material and equipment, including examinations for identification and shipping damage. Following several discussions with AEC, the Inspection Sub-Section has completed its work on establishment of criteria and procedures for vendor inspection. It has been decided that inspection of all engineered items will be done by one of the following: (1) General Electric off-site, (2) U. S. Government agencies off-site, or (3) General Electric at Hanford Atomic Products Operation.

Following is a resume of inspection activities during the month:

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Items	Number	Value
New orders received during the month	167	
Total orders for items requiring inspection	549	
Cumulative orders assigned to inspectors	458	$ 9,432,467
Orders assigned to inspectors this month	124	1,339,498
Orders completed during the month	111	558,951

Reproduction output was 363,906 square feet. The decrease of about 18,000 square feet was caused by the lack of any substantial orders from AEC, and the low demand for documents and specifications.

Engineering Files distributed about 149,000 prints, including about 5,200 classified items. The largest orders were 7,528 prints for Reactor Plant Modifications, 6,307 prints for 1706-KER Recirculation Facility, and 4,008 for Metal Conversion Plant.

Estimating workload increased to 84 estimates, of which 34 were completed. The completed estimates comprised the following: project proposal, 14; study, 9; fair cost, 5; construction, 4; and budget, 2.

Property evaluation work was completed on five projects, and work was continued on four major projects.

Field Services continued with assistance on the re-survey of Richland, and on five phases of work in construction areas.

D. Craft Labor

See Summary above.

III. REPORT OF VISITORS

To Hanford, June 1955

John Salsbury and D. L. Benz of Trane Company, Portland, Oregon, visited D. L. Ballard June 2 and 3 to service refrigeration units furnished by their company.

H. Morrison of Morrison Refrigeration, Pasco, Washington, visited D. L. Ballard June 2, 7, and 29 to service refrigeration units.

Justine Schneeman and Jack Alexander of X-Ray Products Corporation, Los Angeles, California, visited Project and Design Section personnel to present a lecture on non-destructive testing June 2.

L. P. Sharts of L. H. Butcher Company, Seattle, Washington, visited R. M. Griffith on June 9 and 24 to inspect Udylite machines.

F. R. Radel of Manning, Maxwell and Moore Company, Muskeogan, Michigan, visited R. C. Hollingshead June 13 and 14 for conference on equipment.

H. Palm of Udylite Company, Detroit, Michigan, visited R. M. Griffith on June 14 to inspect Udylite machines.

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Larry Urban of Allis-Chalmers, Milwaukee, Wisconsin, visited D. F. Watson on June 14 and 15 to assist in start-up of induction heating equipment in connection with CG-546.

B. To Other Installations, June 1955

W. C. Royce visited DeLaval Steam Turbine Company, Trenton, New Jersey, June 3 to 10 to witness the installation and testing of pump model as required for HWC-7077.

H. Radow visited Struthers-Wells Corporation, Warren, Pennsylvania, June 11 to 17 for conference on calciner contract, including approvals of shop drawings.

D. L. Hovorka visited Struthers-Wells Corporation, Warren, Pennsylvania, June 13 to 17 to coordinate inspection activities.

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ADVANCE ENGINEERING SECTION

MONTHLY REPORT

JUNE, 1955

The higher reactor productivity in 1954 compared to that experienced in 1953 is equivalent to that obtainable from spending $120,000,000 for new reactor construction.

W. K. Woods

Manager, Advance Engineering
ENGINEERING DEPARTMENT

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EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

MONTHLY REPORT SUMMARY - JUNE, 1955

PERSONNEL PRACTICES SECTION

All of the 300 people scheduled to participate in the second phase of the Management Appraisal Program have been tested. Test results, Internal Management Appraisals and completed Personnel Information Summary Forms have been mailed to Booz, Allen and Hamilton concerning all 300 participants.

The number of applicants interviewed in June was 1,571 as compared with 1,526 for May. In addition, 74 new applicants applied by mail. Open, non-exempt, nontechnical requisitions decreased from 194 at the beginning of the month to 144 at month end. Two hundred and nineteen employees were added to the roll and 99 removed during the month. The separation rate for fiscal month of June was 1.19% and for fiscal month of May .71%. These rates when converted to annual rates are 12.41% and 9.25% respectively. During June 69 new requests for transfer to other type work were received by Employment and 38 transfers were effected. Attendance recognition awards were distributed to 188 employees in June, including 30 who qualified for five-year awards.

One employee died during the month of June. One hundred and seventeen visits were made to employees confined to Kadlec Hospital, and 27 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 98.5%, in the Insurance Plan 99.4%, and the Employee Savings and Stock Bonus Plan 47.9%. At month end there were 594 non-veterans registered under Selective Service and 680 military reservists were on the roll. Since August 1, 1950, 412 employees have terminated to enter military service, of which 157 have returned, 43 have not claimed re-employment rights, leaving 221 still in military-leave status.

One hundred and six adopted suggestions were approved for awards in June resulting in cash awards totaling $1,705 with a total net savings of $12,383.07.

Two hundred and two offers have been extended to BS/MS graduates for the Rotational Training Program and there have been 65 offers accepted to date and 124 rejections. Acceptances have been received from 10 experienced candidates yet to report; there are 4 open offers and 11 other candidates are under active consideration. A total of 13 PhD candidates have accepted offers since October 1, 1954 and 122 candidates have accepted invitations to visit HAPO during the current season.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS SECTION

The News Bureau issued 58 releases during the month, three of which were especially planned for national publicity purposes and were sent to the Schenectady News Bureau. Five manuscripts were approved for publication, and 11 technical papers and 3 technical abstracts received all required approvals. Arrangements were made for one speech to be delivered before a public group. The Community Newsletter was written and distributed to community leaders in Pasco, Kennewick and Richland. Copies of the May, 1955 issue of the GE REVIEW, which contained Part 5 of the "Three R Series," were sent to all educational leaders on the Richland, Kennewick and Pasco community mailing list. Four Management NEWS Bulletins were produced and distributed to all exempt personnel during the month.

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EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS SECTION (Continued)

Two stories and a picture were circulated to papers in the Pacific Northwest to publicize the earning of the Central Safety Council Award.

"Inside Hanford," weekly radio series on plant subjects and personalities, has been accepted for broadcast by Station KHQ, NBC outlet in Spokane. An introductory program on the history of Hanford plant launched a series of 14 "Inside Hanford" programs to be broadcast by this outlet. Two were released this month. A local release was sent out regarding this series of weekly programs.

A full page advertisement showing GE's contribution to prosperity in this area was prepared and inserted in the Sunday, June 19, issue of the Tri-City Herald. This was a special issue of the Herald commemorating the opening of Northern Pacific's new retarder yard in Pasco.

Arrangements were made for the layout and signs for a Traffic Safety Awards display used by our Community people at a meeting of the Association of Washington Cities in Tacoma.

A proposed mailing to Richland residents concerning the use of water was discussed with Community officials. The information was disseminated as a news story which received prominent and favorable news treatment in one of the local newspapers, followed by GE NEWS coverage.

Material prepared for the Manager of Biology to use at the Harwell Conference in England was completed this month. A total of 48 charts, maps and illustrations were completed and submitted to the Photography Unit to be made into 35mm slides.

A total of 300 photographic assignments were covered for the month of June, and 14,196 prints were produced.

SALARY AND WAGE ADMINISTRATION SECTION

A drafting and design wage rate study, which included most of the larger architect-engineering firms on the west coast, was completed and distributed to the participants. HAPO also participated in two wage studies being conducted by outside concerns.

Employee attitudes as related to compensation and as evidenced in the recent attitude survey were studied.

Refinements to the northwest area Wage Rate Survey were completed and supplementary analyses are now underway.

LABOR RELATIONS SECTION

Three disputes between the Company and HAMTC were settled in favor of the Company during the month. One concerned an unfair labor practice due to the closing of the Prosser barricade which was dismissed by the Regional Director, NLRB. The second, a petition for representation of laboratory assistants in the Manufacturing Department was dismissed with the Board's agreement with the Company that the unit being sought was not appropriate as it represented only a segment of the employees engaged in similar work.

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LABOR RELATIONS (Continued)

Arbitration on the alleged violation of call-in procedure and payment practices filed by the Guard's Union was the third case decided in the Company's favor. This case was decided by Judge H. A. Seering.

The Hanford Atomic Metal Trades Council has brought suit against the Company in which they charge that the Company unilaterally decided to disregard and supersede a "working agreement" which originated in a production area in May, 1953 between supervision and a group of Chemical Worker stewards.

A controversy exists between the Council and the Company involving the effect that travel time in connection with a call-in has on the sixteen-hour rule in the union Agreement. It is the Company's position that it was not intended that call-in travel time be considered when determining if an employee worked more than sixteen hours. The Council bases its position on a literal interpretation of the Agreement and is requesting retroactive pay adjustments.

The Operating Engineers employed by the J. A. Jones Company on minor construction returned to work on June 7 after walking off the job on May 24. The dispute was not settled and the last meeting was held on June 28, the details of which are not known.

EDUCATION AND TRAINING SECTION

The School of Nuclear Engineering has completed its best year to date. Total paid tuitions 1954 - 1955 were 73% above the 1953 - 1954 year, but the same high percentage (85%) of students completed their studies successfully. Unit costs were down by 15% even after increases in assessed charges.

With 3 placements, and 28 new hires reporting, rotational trainees have increased from 25 to 50. 14 additional are still to report. Competition for these men is already high among the HAPO components employing these people. A comprehensive 12-hour orientation program for these trainees June 27-29 has been well received.

The summer program toward wider recognition at the universities is underway with 7 university professors, 5 graduate students, and 9 college juniors. The experience of the professors will be utilized in occasional conferences to improve techniques of instruction in the School of Nuclear Engineering.

HEALTH AND SAFETY SECTION

A major injury to an operations employee on June 21 ended 143 days of no loss time injuries. 6,755,342 man-hours of exposure were accumulated and resulted in the winning of the Central Safety Council's award. The Community's record of no major injuries continued through the month to give 409 days. Total injuries are again high, exceeding 400.

The average daily adult census decreased from 56.4 to 49.1 as compared to 60.3 a year ago. In spite of the low census hospital losses were some $3,000 less than the budget figure due to economy measures.

The chest x-ray program with the mobile equipment resulted in a high coverage for all Richland residents.

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AUXILIARY OPERATIONS AND PLANT PROTECTION SECTION

A new postal service, certified mail, was placed in service in the plant during the month. This service for mail of no intrinsic value but on which proof of delivery is required can be used in lieu of registered mail. Estimated annual savings in postal charges by substituting certified for registered mail is $600.

The new 700 Area Plant Telephone exchange was placed in service on June 17. Concurrently all 100-K area telephones were transferred from the construction manual switchboard to the new 100-K area dial exchange.

Unaccounted for documents were reduced in total from 221 to 220 through the declassification procedure. Security violations for the 700 area decreased from two to one during the month and area violations decreased from 20 to 14.

COMMUNITY SECTION

Effective midnight June 30 both policing and fire protection for North Richland was discontinued by HAPO with the latter functions being turned over to the Army.

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Employee and Public Relations

PERSONNEL PRACTICES

General

All of the 300 people scheduled to participate in the second phase of the Management Appraisal Program have been tested. Test results, Internal Management Appraisals and completed Personnel Information Summary Forms have been mailed to Booz, Allen and Hamilton, Los Angeles, concerning all 300 participants. Although no firm date can yet be established W. S. Powell, Booz, Allen and Hamilton, has estimated that the depth interviews for the 50 people selected to participate in this phase can get under way by mid-July.

Detailed analysis of 1955 attitude survey results have been completed and distributed as requested for Engineering and Manufacturing. The detailed reports requested by Financial, Radiological Sciences, and Employee and Public Relations are scheduled for completion within the next two or three weeks.

Employment	May, 1955	June, 1955
Applicants interviewed	1,526	1,571

393 of the applicants interviewed during June were individuals who applied for employment with the Company for the first time. In addition, 74 applications were received through the mail.

	May, 1955	June, 1955
Open Requisitions		
Exempt	1	2
Nonexempt	194	144

Of the 194 open, nonexempt, nontechnical requisitions at the beginning of the month, 151 were covered by interim commitments. Of the 144 open, nonexempt, nontechnical requisitions at month end, 92 were covered by interim commitments. During June, 93 new requisitions were received requesting the employment of 134 nonexempt, nontechnical employees.

	May, 1955	June, 1955
Employees added to the rolls	121	219
Employees removed from the rolls	73	99
NET GAIN OR LOSS	+ 48	+ 120

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Employee and Public Relations

PERSONNEL PRACTICES

Separation Rate:	Fiscal Month May, 1955		Fiscal Month June, 1955	
	Male	Female	Male	Female
	.42%	2.02%	.67%	3.63%

Over-all Separation Rate:	Fiscal Month May, 1955	Fiscal Month June, 1955
	.71%	1.19%

During June, 9 employees left voluntarily to accept other employment, 4 left for business for self, and 6 left to enter military service.

Transfer Data

Accumulative total of requests for transfer received since 1-1-55	451
Number of requests for transfer received during June	69
Number interviewed in June, including promotional transfers	76
Transfers effected in June, including promotional transfers	38
Transfers effected since 1-1-55, including promotional transfers	268
Transfers effected in June for employees being laid off	9
Number of stenographers transferred out of steno pool in June	8
Transfer requests active at month end	303

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	18	166	--	184
Re-engaged	--	---	--	---
Reactivates	2	29	--	31
Transfers	3	1	--	4
TOTAL ADDITIONS	23	196	--	219

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	10	52	4	66
Removals from rolls(deactivates)	2	28	-	30
Transfers	2	1	-	3
TOTAL TERMINATIONS	14	81	4	99

GENERAL

	5-1955	6-1955
Photographs taken	163	294
Fingerprint impressions	109	107

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Employee and Public Relations

PERSONNEL PRACTICES

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	5-1955	6-1955
General Electric cases	135	114
Facility cases	17	18
Total	152	132

In connection with the Technician Training Program, 27 candidates have been considered and 14 of that number selected for further consideration. It is planned to process 25 applications for the 18 hires on requisition.

The fifteen Firemen who have received their notice of force reduction with the Community Fire Unit have been interviewed and job offers were made to fourteen. The remaining Fireman is eligible for a Formal "P" clearance only, and to date, there have not been openings whereby the services of one with a limited clearance could be fully utilized. Of the fourteen who received job offers, 10 accepted and were placed. Three of those not placed indicated a desire to stay but were not interested in the job offered.

This summer, insofar as temporary positions are concerned, the following have been hired:6 Servicemen, 3 Draftsmen, 4 Laboratory or Engineering Assistants, 1 Tabulating Machine Operator "A", and 1 Trackman. Servicemen, of course, have been assigned to the lawn watering crew and the others, in most cases, are rehires filling in on vacation relief.

Advertisements for Instrument Technicians have netted a total of 59 inquiries and to date, two technicians are in process who are considered qualified and interest in the position. A representative of the Plant Engineering Group is presently on a recruiting trip to interview nine of these candiates.

Personnel Records and Investigations

INVESTIGATION STATISTICS	5-1955	6-1955
Cases received during the month	138	158
Cases closed	172	314
Cases found satisfactory for employment	138	144
Cases found unsatisfactory for employment	53	45
Cases closed before investigation completed	35	16
Special investigation conducted	10	9

PERFECT ATTENDANCE RECOGNITION AWARDS	
Total one-year awards to date since January 1, 1950	5217
One-year awards made in June for those qualifying in May	43
Total two-year awards to date since January 1, 1950	2929
Two-year awards made in June for those qualifying in May	43
Total three-year awards to date	1671
Three-year awards made in June for those qualifying in May	35
Total four-year awards to date	763
Four-year awards made in June for those qualifying in May	37
Total five-year awards to date	204
Five-year awards made in June for those qualifying in May	30

1206136

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

PERSONNEL PRACTICES

SERVICE RECOGNITION

Total Service Recognition Pins presented to date	5204
Five-year Service Recognition Pins presented during June to Exempt personnel	34
Five-year Service Recognition Pins presented during June to Nonexempt personnel	27
Ten-year Service Recognition Pins presented during June to Exempt personnel	1
Twenty-year Service Recognition Pins presented during June to Exempt personnel	1

During June, 16 people whose continuity of service was broken while in an inactive status were so informed by letter.

Employee Services

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	117
Salary checks delivered to employees at Kadlec Hospital	25
Salary checks delivered to employees at home	2

At the end of the month, participation in the Benefit Plans was as follows as compared with last month's participation:

	MAY	JUNE
Pension Plan	98.5%	98.5%
Insurance Plan	99.4%	99.4%
Savings and Stock Bonus Plan	48.1%	47.9%

One employee expired during the month of June, namely:

6/24/55 Manufacturing

One retired employee expired during the month of June, namely:

Normal Retirement

All necessary arrangements have been made to settle all matters of business in connection with the named deceased employees at an early date.

21 letters were written concerning deceased employees and their families during June regarding payment of monies from the Company, and general information.

A total of 184 new employees attended Orientation Programs given by members of this group during the month of June. Of this number, 30 were for summer employment only; therefore the percentage of participation in the Benefit Plans excludes the summer hires. 100% have signed up to participate in the Pension Plan, 100% have signed up to participate in the Insurance Plan, and 92% have signed up to participate in the Good Neighbor Fund Program.

PRIVACY ACT MATERIAL REMOVED

1206131

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services, cont'd.

Since September 1, 1946, 167 life insurance claims have been paid totaling $1,103,513.00.

Eight employees retired during the month of June, namely:

Henry R. Browne	W 15880	Normal	Retirement
Tom C. Goodwin	W 7084	"	"
Sherman Rhinehart	W 4044	"	"
Mahlon J. McDermott	W 6065	"	"
Lloyd P. Ableman	W 4855	"	"
Abraham Winchester	W 5449	Optional	"
Theodore G. Jacobsen	W 4180	"	"
Mathias J. Schirado	W 6503	"	"

During June, 30 letters were written concerning retirement and retired employees, providing information of a general or specific nature. To date 350 have retired at Hanford, of which 178 are continuing their residence in this vicinity, 154 are living elsewhere, and there are 18 deceased retired employees.

Military Reserve and Selective Service

Total number of non-veteran employees subject to military service training through Selective Service System. 594

Number Classified	1A	113
Number Classified	2A	104
Number Classified	2S	9
Number Classified	3A	227
Number Classified	4F	83
Number Classified	1D	52
Number Classified	4A	6
	Total	594

Number of Technically Trained & Engineering Personnel for whom deferments are currently being requested. 111

Number of Non-Technically Trained & Engineering Personnel for whom deferments are being requested. 5

Total 116

Accumulated total of deferments requested 1500

Accumulated total of deferments granted 1203

Current number of deferment requests pending 27

Current number of deferment requests denied 5

Current number of deferment requests granted 10

1200138

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Service

During Month of June

Number of deferment requests pending at Local Board Level	21
Number of deferment requests pending at Appeal Board Level	5
Number of deferment requests pending at Presidential Appeal Level	1
Total	27
Number of deferment requests denied by Local Boards	5
Number of deferment requests denied by State Appeal Boards	0
Number of deferment requests denied by Presidential Appeal Board	0
Total	5
Number of deferments granted by Local Boards	10
Number of deferments granted by State Appeal Boards	0
Number of deferments granted by Presidential Appeal Board	0
Total	10
Number of Technically Trained & Engineering Personnel denied, or requesting no further appeal, now pending induction	18
Number of Technical Graduates with over two years of deferments	77
Number of Selective Service vulnerable Technical Graduates Enlisted	2
Number of Selective Service vulnerable Technical Graduates Drafted	2
Number of Technical Graduates called to active duty under R.O.T.C.	2
Total	6

Reservists Data - Total Number of Reservists on Roll

Number of Active Reservists	166
Number of Inactive Reservists	496
Number of employees in the National Guard	18
Total	680
Reservists and National Guard members subject to drills, tours of Duty, Cruises, Summer Camp and/or Weekly or Monthly meetings	254

1206739

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Services

Military Service Leaves of Absence - August 1, 1950 through June 30, 1955

Reservists		127
Selective Service System		278
Female Employees Enlisted		7
	Total	412
Total number returned to roll		157
Reservists 71 Sel. Serv. System 86		
Known number not claiming re-employment rights		43
Number of employees still on military leaves		221

1206740

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

WORKMEN'S COMPENSATION AND SUGGESTION PLAN

Suggestion Plan	May	June	Total Since 7-15-47
Suggestions Received	235	209	17120
Acknowledgements to Suggesters	251	222	
Suggestions Pending Acknowledgement	46	33	
Suggestions Referred To Depts. For Investigation	340	314	
Suggestions Pending Referral to Departments	68	50	
Investigations Completed and Suggestions Closed	288	325	
Suggestions Adopted - No Award	4	0	
Adopted Suggestions Approved by Board for Award	72	106	
Total Net Cash Savings	$15,412.35	$12,383.07	
Total Cash Awards	$1,945.00	$1,705.00	
Total Number Suggestions Outstanding to Departments	638	571	

Below are statistics pertaining to Suggestion Plan operation.

	6 months 1955	6 months 1954	All 1954
Suggestions Submitted	1,499	1,107	2,579
Adoption Ratio	37.0%	31.3%	29.6%
Awards to Savings Percentage Ratio	13.4%	12.9%	13.4%

The 1954 entire Company average adoption ratio was 32.7% and the ratio of awards to savings was 17.1%.

Life Insurance

Sixty-four requests for code information were received from insurance companies and investigation agencies and furnished during the month of June, 1955. The code information is supplied in accordance with a prearranged plan whereby employees of this project may be insured on the same basis as those working elsewhere.

Insurance Statistics

Claims reported to Department of Labor	May, 1955	
	Long Forms	Short Forms
	66	486
	June, 1955	
	Long Forms	Short Forms
	60	565

Total Since September, 1946 - 27,078

1206741

PRIVACY ACT MATERIAL REMOVED

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

WORKMEN'S COMPENSATION AND SUGGESTION PLAN

Insurance Statistics (Continued)

	May, 1955	June, 1955
Claims reported to Travelers Insurance Co.	11	* 8

Total Since September, 1946 - 995

Workmen's Compensation

a. — Date of Injury: 8-24-54; Employer: ; Nature of Injury: Hearing Loss

alleged that he had sustained a loss of hearing in the left ear as a result of exposure to a loud noise from a new lathe which was being tested. Allowance of the claim was opposed and the Department of Labor and Industries sent to a commission of doctors who determined that there was no causal relationship between his employment and his loss of hearing. As a result the Department of Labor and Industries issued an order on June 16, 1955 rejecting the claim. is a metal fabricator in the Metal Preparations Section.

b. — Date of Injury: 6-4-54; Employer: ; Nature of Injury: Contusion of Neck

While employed as a fireman in the Auxiliary Operations and Plant Protection Section, was riding a fire truck and struck his neck on a bar on the back of the truck. After considerable treatment from several doctors, the Department of Labor and Industries issued an order advising that had reached a point in his recovery where he could return to work on April 8, 1955 and that his status of temporary total disability terminated on that date. has since submitted a Notice of Appeal to the Board of Industrial Insurance Appeals contending that he was not able to resume his employment on April 8, 1955, that he is still unable to work and under the care of a physician. was removed from the payroll on May 18, 1955 for unsatisfactory job performance, mainly due to excessive absenteeism, which, according to Industrial Medical, was unrelated to the injury.

c. — Date of Injury: 1-7-53; Employer: ; Nature of Injury: Contusion of the Coccyx

While employed as a personnel meter clerk in the Radiological Sciences Department, sustained a contusion of the coccyx. Her claim was finally

* Of the claims reported to Travelers Insurance Company during the month of June six were property damage, one was bodily injury, and one was both bodily and property damage.

1206742

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

WORKMEN'S COMPENSATION AND SUGGESTION PLAN

Workmen's Compensation, Continued

closed on August 26, 1954 with a final award of 5% of the maximum allowable for an unspecified disability ($300). filed an appeal from the order paying the disability award and at a conference on June 8, 1955 it was agreed that the appeal would be disposed of by the payment of additional medical bills in the sum of $222.50 which had been incurred by subsequent to closure of the claim.

General

During a recent visit to the offices of the Board of Industrial Insurance Appeals it was learned that the hearing loss cases cannot be decided until a brief is submitted by the claimants' attorneys, Williams and Critchlow. The Board has been waiting for the brief which is to be submitted by the claimants' attorneys and then another brief will be submitted on behalf of the Department of Labor and Industries and the employer. Upon receipt of the briefs the Board will be in a position to issue a decision and order on the hearing loss cases.

Liability Insurance

a.

A Summons and Complaint was served upon the on June 1, 1955 on behalf of , a Richland attorney. The action is for alleged negligent destruction of a small portable radio owned by . The total amount claimed is $51 plus costs. The matter has been referred to The Travelers for arrangements for the necessary defense. We have been informed by Mr. Charles Powell, the Travelers attorney, that an Appearance has been filed by way of a Demurrer and that an answer to the Complaint has been prepared and will be filed in the very near future. No date has been set for trial.

b.

A Summons and Complaint was served upon the on June 2, 1955 on behalf of employee in the Manufacturing Department, Reactor Section, Maintenance Sub-Section. The action is for alleged injuries sustained by when he was allegedly struck by a metal ashtray thrown by a fellow workman. The total amount claimed is $25,000 plus costs. The matter has been referred to The Travelers for defense.

General

The advisability of obtaining liability insurance coverage on a premium basis is being considered. The necessary data has been accumulated and forwarded to Mr. L. W. Mosher, Manager, Insurance Services Department, Schenectady, in order to obtain an estimated premium rate.

1206743

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations
PERSONNEL PRACTICES

Technical Recruitment

Status of the recruiting for the Rotational Training Program may be summarized as follows:

Field	Offers Extended	Offers Accepted	Offers Rejected	On the Roll	Estimated Requirements
Engineering:					
Chemical	60	17	41	12	27
Mechanical	43 *	13	27	9	28
Electrical	30	11	18	9	17
Chemistry	26	13	13	10	36
Physics	21	5	15	3	21
Metallurgy	12	3	6	2	15
Other	7	3	4	3	—
Totals	202	65	124	48	144

* 1 Offer withdrawn

Thirty-one offers have been extended to business graduates resulting in sixteen acceptances and eleven rejections with three offers still outstanding.

A four-day advertising campaign was conducted in Seattle, Portland, Denver, San Francisco and Dallas. Inquiries to date total 100 with 20 candidates possessing qualifications of sufficient interest to warrant interviews.

During the month, a Hanford representative visited the Dugway Proving Ground at Tooele, Utah for the purpose of interviewing technical personnel soon to be discharged from the service. Out of a total of nine candidates interviewed, only three indicated a possible interest in Hanford. Two candidates have been invited to visit the Hanford Operation, and the rest we referred to General Electric organizations in the east.

A total of thirty drop-in visitors were interviewed in the Technical Recruitment offices in addition to those who visited in response to the official invitations.

1206744

Employee and Public Relations
PERSONNEL PRACTICES

Experienced recruiting results for the year may be summarized as follows:

Field	Open Invitations	To Visit	Open Offers	Acceptances not OTR	Offers to be Extended	On the Roll
Engineering:						
Electrical		2			1	1
Mechanical		3	2		3	3
Chemical				2	3	1
Industrial		1		1	1	1
Metallurgical						1
Science						
Chemistry	1		1	3		3
Physics	1	2	1	1	1	1
Other						
Library Science						1
Auditor				3		11
Totals	2	8	4	10	9	24

PhD Recruiting

The following table summarizes the '54 - '55 recruiting activities to date. During June, 14 additional visit invitations were extended, and 10 candidates visited Hanford. Seven additional offers were extended and five offer acceptances were received. Two employees with PhD training were placed on the rolls during June.

	Cases Considered	Invitations Invited	Invitations Open	Invitations Accepted	Visited to date	Offers Made	Offers Open	Offers Accepted	On the Roll
New PhD's	518	212	13	122	97	40	5	13	7
Experienced	59	14	2	8	8	6	0	5	3
Totals	577	226	15	130	105	46	5	18	10

Terminations

During June there were 11 terminations of technical or major exempt employees; 5 entered military service, 3 transferred to other GE sites, 3 entered other employment.

Employee and Public Relations Department

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During the month of June, the News Bureau issued 58 releases. The breakdown by category, distribution and content was as follows:

Subject		Distribution	
Pay and Benefits	12	Hanford Area	41
Employment Services	17	West Coast Area	4
Good Will	3	National	3
Technology and Research	6	Other Special	10
Utilities and Public Works	2		
Safety and Fire	4	Content	
Real Estate	2		
Richland - Hanford Protection	2	Information	1
Education and Library	7	Pictures	1
Plant Services	2	Short	53
Organization Changes	1	Long	1
		Feature	2

The following three releases were sent to the Schenectady News Bureau with carbon copies to N. P. Jackson for use for national publicity: a picture feature on atomic fashions; a magazine-length feature on the School of Nuclear Engineering; and a short story with pictures on the Americium photometer.

Two stories were sent to the local and daily lists. They consisted of: a release concerning the appointment of W. K. MacCready to Manager of Manufacturing and the transfer of J. Emmett Maider, Jr. to the Commonwealth Edison Project; and a story regarding Dr. H. A. Kornberg, Manager, Biology, who is attending the three-nation conference on radiobiology this summer at Harwell, England.

Two stories and a picture were circulated to papers in the Pacific Northwest to publicize the earning of the Central Safety Council Award.

A local release was sent out regarding a series of weekly programs to be broadcast by Spokane, Washington's Radio Station KHQ titled, "Inside Hanford." The first broadcast will introduce the plutonium-producing plant to Spokane and eastern Washington listeners with a dramatization of the project's twelve-year history.

A release to local papers described in detail the procedure necessary to reach Hanford Works' numbers on the new telephone exchange.

Enlargement of the summer technical employment program to include university professors and graduate students was announced. The orientation program for technical and business graduates was described in a local release.

Pictures and cutlines were furnished the two local papers, two Spokane papers, a Yakima paper and a Yakima TV station showing a $2000 contribution being made by check to Richland's American Red Cross Chapter by the General Electric Company.

A series of ten interviews with Hanford scientists were arranged for the local TRI-CITY HERALD reporter. After the articles based on these interviews have appeared in print, the HERALD plans to syndicate them in the Northwest through one of the wire services.

1206746

Employee and Public Relations Department

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

Five manuscripts were approved for publication, and 11 technical papers and 3 technical abstracts received all required approvals during the month.

"Making Atomic Products at Hanford," by B. S. Havens of Schenectady, was reviewed, brought up-to-date, and returned to the editor of the GE REVIEW for inclusion in the atomic power issue scheduled for November.

One speech was arranged during the month. V. J. Byron presented his speech, "The Why of Human Relations," before the Yakima Chapter of the American Institute of Banking on June 9, 1955.

A full page advertisement showing GE's contribution to prosperity in this area was prepared and inserted in the Sunday, June 19, issue of the TRI-CITY HERALD. This was a special issue of the HERALD commemorating the opening of Northern Pacific's new retarder yard in Pasco.

At the request of the Pasco Chamber of Commerce, the display, "The Picture Tour of Hanford," was exhibited at a luncheon on June 21, 1955 honoring the opening of the Northern Pacific retarder yard.

A Community Newsletter was written and distributed to community leaders in Richland, Kennewick and Pasco. Copies of "Putting the Atom to Work" were enclosed.

Copies of the May 1955 issue of the GE REVIEW, which contained Part 5 of the "Three R Series," were sent to all educational leaders on the Richland, Kennewick and Pasco community mailing list.

A Civil Defense air raid warning story was written and distributed to the local list.

Arrangements were made for the layout and signs for a Traffic Safety Awards display used by our Community people at a meeting of the Association of Washington Cities in Tacoma.

Nine semi-weekly reports of significant Hanford developments were sent to N. P. Jackson at Schenectady for transmittal to F. K. McCune and C. W. LaPierre. An arrangement was made at Schenectady to send this report only once a week, on Wednesdays, beginning July 6.

A proposed mailing to Richland residents concerning the use of water was discussed with community officials. The information was disseminated as a news story which received prominent and favorable news treatment in one of the local newspapers, followed by GE News coverage.

Communications Program designed to increase employee participation in the Employee Savings and Stock Bonus Plan was prepared and executed. Media included the GE News, Management News Bulletin, and a letter from the Manager, Employee and Public Relations.

Publicity concerning the June 11 winning of the Central Safety Council Award was given through publication of a Management News Bulletin item on June 13 and distribution to all employees at their homes of an Employee News Letter from the General Manager on June 14.

1206141

Employee and Public Relations Department

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

Display recruitment advertisement for various types of engineers and other technically trained personnel was placed in the June 17-20 issues of daily newspapers in Seattle, Portland, Denver, Dallas and San Francisco. Technical Recruitment reported a total of 46 inquiries at the end of the month. Advertisements for experienced instrument technicians in the April issue of INSTRUMENTS AND AUTOMATION magazine brought 40 inquiries; the May issue, 50 inquiries.

Statement concerning "Steps Toward Better Communications," second in a series about communications, was prepared at the request of the Manager, Union Relations Section, for publication in the Union Relations "Information" Bulletin.

At the request of Radiological Sciences, a communications program for promotion of a personnel meters poster contest, designed to increase employee awareness of the correct way to wear personnel meters, was prepared and approvals were obtained.

Poster for Separations Radiation Monitoring Sub-Section, emphasizing the importance of using monitoring instruments, was placed in production.

Bulletin board notice concerning the Independence Day holiday was produced and posted throughout the plant.

As assistance to Radiological Sciences annual departmental information meeting on June 23, arrangements were made for reservation of Jason Lee School auditorium, obtaining and scheduling public address system and slide projector, and securing catering service to provide refreshments.

Proofs of the handbook for Manufacturing Department employees, "Radiation and Your Job," were read, corrected and returned to vendor.

Letter to users of assigned government vehicles was prepared for the signature of Managers of Manufacturing and Employee and Public Relations Departments, and the Director of Radiological Sciences Department. Letter prepared for the signature of the Manager, Engineering, was revised by Engineering Administration and distributed to all exempt people in that department.

Draft of the copy for a radiation protection booklet concerning Exposure Estimate Cards was prepared at the request of Separations Radiation Monitoring Sub-Section.

The June health bulletin, "Comes Natcherly," and the June safety topic, "On Your Toes," were distributed during the month.

Four Management NEWS Bulletins were produced and distributed to all exempt personnel.

Forty-eight movie projection engagements were met with showing to 982 employees by the Employee Communications Unit.

The June issue of "Your Manufacturing Month" was produced and distributed to all exempt employees in the Manufacturing Department.

1206748

Employee and Public Relations Department

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During June, four eight-page issues of the GE News were produced and distributed. Special emphasis during the month was given to safety and winning of the Central Safety Council's Award, Safety and Stock Bonus Plan, new telephone exchange, suggestion system, and the new IBM type 702 computer. The appointment of W. K. MacCready as Manager, Manufacturing, on August 1, vice J. E. Maider, was announced in the June 24 issue. Also in the June 24 issue was the announcement of the promotion of H. B. Lindberg, Publicity Writer on the GE News since 1952 to the position of GE News Editor effective July 1. In the June 10 issue, a two-page spread depicting GE management at Hanford was published.

Commercial artwork included: five photo layouts and one full page message for the GE News, a full-page community relations advertisement which appeared in a local newspaper was prepared for Public Communications Unit; two cartoons and a rough layout of a Richland community traffic award display; layout and final artwork was prepared for the July health topic and for the "Your Manufacturing Month" bulletin; final artwork was prepared for three radiation protection posters, as well as a rough layout for a radiation guide pamphlet for Hanford visitors; layout for newspaper employment recruiting advertisement, photo air brushing, preparing one training visualizer and one nine-point job program visualizer; and revising type layout for "Here's Hanford" booklet pages.

"Inside Hanford," weekly radio series on plant subjects and personalities, has been accepted for broadcast by Station KHQ, NBC outlet in Spokane. An introductory program on the history of the Hanford plant launched a series of 14 "Inside Hanford" programs to be broadcast by this outlet. Two were released this month.

Four broadcasts of "Inside Hanford" were carried over KWIE. Feature topics were: the Early Days at Hanford, the Power Section's Steam Plant Operation, Central Stores, and the Photography Unit.

The "Hanford Science Forum"was broadcast three times this month. A fourth broadcast was prevented because of the station's commitment to release a national feature.

At the request of the U. S. Army Special Services, Camp Hanford, a member of the Audio-Visual Communications Unit greatly assisted in the production and recording of spot announcements for release to local radio outlets. The spots advertised the forthcoming band concert and variety show to be presented by Camp Hanford personnel in Riverside Park.

At the request of KWIE management, Frank Losch participated in a half hour radio show which was broadcast to mark Radio Station KWIE's increase to 5,000 watts of power.

At the request of the AEC, Audio-Visual Communications Unit arranged for tape recording of a public auction held this month for sale of excess Hanford materials. These recordings are invaluable for documentary purposes and in dispute hearings.

1206749

Employee and Public Relations Department

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

Graphics June assignments were distributed as follows:

	Percent
General Administrative (Includes Operations Research)	1
Employee and Public Relations	15
Engineering	42
Manufacturing	15
Financial	9
Radiological Sciences	9
Atomic Energy Commission	9

	May	June
Total assignments completed	62	55
Total assignments backlog	39	49

Material prepared for the Manager of Biology to use at the Harwell Conference in England was completed this month. A total of 48 charts, maps and illustrations were completed and submitted to the Photography Unit to be made into 35mm slides.

A total of 35 visual aids were prepared for representatives of the Manufacturing and Engineering Departments to use in lectures to technical graduates.

Perspective and detail illustrations of a "Graphite Superheating Reactor" were completed for a representative of Advance Engineering.

Graphics Statistical Summary

	Charts or Graphs	Illustrations	Other
Report Material (Includes Technical Publications)	52	11	-
Technical or Scientific Illustrations	-	25	-
Mechanical Art (Flow Charts, Schematics, Maps, Etc.) - Not for Publication	43	5	15
Lecture Material (Includes Plates for Slides)	48	8	-
Posters and Signs	-	21	-
General (Posting of Current Data, Assembly, Revisions, Etc.)	89	-	-
	232	70	15

A total of 300 photographic assignments were covered for the month of June, and 14,196 prints were produced.

See attached statistical report for Photography Unit.

1206750

PHOTOGRAPHY UNIT MONTHLY REPORT JUNE, 1955	Requests	2" X. 2"	2" X. 4"	4" X. 5"	5" X. 7"	8" X. 10"	8½" X. 11"	11" X. 14"	16" X. 20"	N E G.	35mm Color Slides	35mm B&W Slides	3¼" X 4" Color Slides	3¼" X 4" B&W Slides	16mm M.P. Film
EMPLOYEE & PUBLIC RELATIONS															
PERSONNEL PRACTICES															
Technical Recruit.	1		1							2					
EDUCATION & TRAIN.	15		15							30					
EMP. COMM. & PUBL. RELATIONS	44		171	28		385				91					
Audio-Visual	7			12		2									700
Empl. Comm.	53		98		5	123				171					
Photography	3					16	48								
Graphics	1									4			4		
UNION RELATIONS	1						3								
AUXILIARY OPER. & PLANT PROTECT.															
Telephone	1					9				6					
Security & Patrol	3					18				28					
Patrol	2			12		25									
Plant Protect. Services	1	4186	4058												
COMMUNITY															
Police	6	55	145	50											
Library	2				12	9				10					
ENGINEERING															
ADVANCE ENGR.	1				4										
DESIGN															
Process Engr.	10			6		44	421			75	6				
PROJECT															
Project Aux.	1						240								
Separations Proj.	1						20			10					
Project Engr.	3			90			36			10					
Minor Construct.	3						22			14					

1206751

PHOTOGRAPHY UNIT
MONTHLY REPORT
JUNE, 1955 (Con't)

	Requests	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	11" X 14"	16" X 20"	N E G.	35mm Color Slides	35mm B&W Slides	3¼" X 4" Color Slides	3¼" X 4" B&W Slides	16mm M.P. Film
PILE TECHNOLOGY	8						131			14				15	
Metal. Res.	11			190	5		134		1	45			6		
Pile Materials	4						15			6				5	
Pile Engr.	6		8			5	106			23					
Fuel Technology	37					3	2206		11	335			12	3	200
SEPARATION TECH.	1			100											
Chem. Devel.	3						113			8					
Chem. Research	6						44			44			16		
MANUFACTURING															
REACTOR															
Process	2			23	26										
SEPARATIONS	5					20	18			33					
METAL PREPARATIONS	7					15	98			22					
Process Engineering	5			36			56			45					
Expansion Program	4					6				6					500
TRANSPORTATION	3					28				3					
FINANCIAL	4	18		2		2									
RADIOLOGICAL															
SCIENCES															
RADIOLOGICAL	1					4									
RECORDS AND STANDARDS															
BIOPHYSICS	9				176	27	24			35				15	
BIOLOGY	13				4	3				38	15	11	72	22	
RADIOLOGICAL	3	6			4					71		10	30	10	
ADMINISTRATION & COMM.															
A.E.C. SAFETY	8			40		101									
A.E.C. SECURITY	1	18													

1206752

PHOTOGRAPHY UNIT
MONTHLY REPORT
JUNE, 1955 (Con't)

	Requests	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	11" X 14"	16" X 20"	N E G.	35mm Color Slides	35mm B&W Slides	3¼" X 4" Color Slides	3¼" X 4" B&W Slides	16mm M.P. Film
TOTALS	300	4283	4496	589	236	845	3735		12	1279	21	21	140	70	1400

	APRIL	MAY	JUNE
TOTAL ASSIGNMENTS	325	307	300
TOTAL NEGATIVES	1,414	1,349	1,279
TOTAL PRINTS	18,031	14,942	14,196

1206753

UNION RELATIONS

Union Relations - Operations Personnel

The National Labor Relations Board, in a letter to the Hanford Atomic Metal Trades Council dated June 27, has refused to issue a complaint against the Company in connection with the unfair labor practice charge brought by the Council on April 19 regarding the closing of the Prosser barricade. The Board stated in their letter that ". . . It does not appear that further proceedings are warranted inasmuch as there is insufficient evidence of violations. . ." The Council has the option of requesting a review of this action by filing the request within ten days from the date of receipt of the letter. A decision regarding the ultimate operation of the Prosser barricade is being held in abeyance pending certain knowledge that this issue is disposed of.

The arbitration dispute between the Company and the Hanford Guards Union regarding an alleged violation of the call-in procedure was decided in favor of the Company by Judge Harold A. Seering on June 13. Judge Seering determined that the Patrolman in question had been properly paid.

The National Labor Relations Board, in a "Decision and Order" dated May 31, dismissed a petition submitted by the Hanford Atomic Metal Trades Council who was seeking certification to represent Laboratory Assistants in the Manufacturing Department. The Board concurred in the Company's position that the unit being sought was not appropriate as the Petitioner was seeking only a segment of the employees engaged in similar work.

The Hanford Atomic Metal Trades Council has brought suit against the Company in which they charge that the Company unilaterally decided to disregard and supersede a "working agreement" which originated in a production area in May 1953 between supervision and a group of Chemical Worker stewards. The working arrangement was given added significance by the union since it had been signed by the parties involved. Outside counsel has been retained and, on the basis of a preliminary review, we are advised that our position in the matter is a defensible one. Appropriate steps were taken approximately two years ago to eliminate any field agreements that were executed by supervision and union representatives. There appears to be a reasonable chance that the instant case will be resolved short of court action.

This position has been discussed with the union on numerous occasions and has been documented in letters and Step II answers to grievances which the union has accepted. The suit appears to result from political problems within the Chemical Workers Union in which the principle of such understandings is in dispute. In this connection the union does not appear to want the "Agreement" in question but is concerned because the Company superseded it without their concurrence.

There were no meetings during the month with the Hanford Guards Union in connection with their desire to discuss their classification grade. The last such meeting occurred on May 24.

1206754

Employee and Public Relations

UNION RELATIONS

As mentioned in the May report, the Material Expediters who won bargaining rights last October 1 resumed negotiations on May 20. However, there were no further developments during June.

A controversy exists between the Council and the Company regarding the intent of the clause in the union Agreement which provides that an employee will receive double time pay for work in excess of sixteen hours in a work day. The controversy involves the effect that travel time in connection with a call-in has on the sixteen-hour rule. The matter is further complicated by the fact that, from June 1954 to April 1955, Payroll disregarded an employee's regular shift when determining if an employee worked in excess of sixteen hours. This was corrected in April with the result that call-in travel time became a particularly significant period. For example, a straight day worker who works his regular shift and later that day is called in to work graveyard shift is paid for more than sixteen hours during that work day because of the travel time.

It is the Company's position that it was not intended that call-in travel time be considered when determining if an employee worked more than sixteen hours. The Council, however, is disregarding the intent. They base their position on a literal interpretation of the Agreement and are requesting retroactive pay adjustments. They are also considering arbitration. Discussions are presently being held with the business representative of the Council in an effort to find a method of resolving the dispute amicably. Call-in travel time is currently being disregarded by the Company.

Grievance Statistics:

A total of fifty-three (53) grievances were received and four (4) Step II grievance meetings were held during the month. A breakdown of the grievances received and processed follows:

ALL DEPARTMENTS

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Received this month	52	1	0	53	0
Received this year	273	3	0	276	11
Step I					
Pending May 31	5	0	0	5	2
Settled this month*	40	0	0	40	0
Settled this year	180	2	0	182	2
Pending June 30	0	0	0	0	1

*Grievances brought to Step II prior to April 1, 1955, but never processed by the union are, for the purpose of this report, considered settled at Step I.

1200755

Employee and Public Relations

UNION RELATIONS

ALL DEPARTMENTS (Cont'd.)

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Step II					
Pending May 31	43	0	0	43	0
Settled this month**	10	0	0	10	1
Settled this year	76	1	0	77	7
Pending June 30	59	0	0	59	0
Arbitration					
Pending May 31	2	1	0	3	
Settled this month (see note)	0	1	0	1	
Settled this year (see note)	0	1	0	1	
Pending June 30	0	0	0	0	
Total Settled this Month	50	1	0	51	1
Total Settled this Year	256	4	0	260	9

Note: The report for May indicated that five HAMTC grievances had been settled during that month by arbitration. This also caused the report to indicate that five HAMTC grievances had been settled this year by arbitration. Both of these entries in the May report were in error. There have been no HAMTC grievances settled by arbitration this year. The correction is reflected in this report.

BY DEPARTMENTS

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Manufacturing						
Reactor - Unit	14	118	15	79	5	37
Separations - Unit	22	81	22	68	2	15
- Nonunit	0	5	0	2	0	3
Metal Preparation - Unit	9	30	2	14	2	9
Transportation - Unit	0	15	0	10	0	7
Electrical Utilities - Unit	0	4	1	2	0	2
Stores - Unit	2	5	0	2	1	2
Employee & Public Relations						
Community - Unit	1	5	0	1	0	2
Aux. Ops. & Pl. Pro. - Unit	5	15	2	8	0	3
Radiological Sciences - Unit	0	3	0	1	0	0
- Nonunit	0	1	0	0	0	0
Engineering - Nonunit	0	3	0	0	1	1
Financial - Nonunit	0	2	0	1	0	1

*Grievances brought to Step II prior to April 1, 1955, but never processed by the union are, for the purpose of this report, considered settled at Step I.

**Grievances which the union formally indicated their intention to submit to arbitration but have taken no further action since April 1, 1955 are, for the purpose of this report, considered settled at Step II.

1206756

Employee and Public Relations

UNION RELATIONS

BY SUBJECTS

	Manufacturing		Emp. & Pub. Relations		Radiological Sciences		Engineering		Financial	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Unit										
Recognition	0	1	0	0	0	0				
Discrimination	0	3	0	0	0	0				
Jurisdiction	23	101	2	11	0	0				
Health-Safety-Sanitation	2	10	1	3	0	1				
Hours of Work	0	15	0	0	0	0				
Overtime Rates	5	33	1	1	0	1				
Vacations	0	1	0	0	0	0				
Seniority	7	18	0	0	0	0				
Wage Rates	5	18	1	1	0	0				
Miscellaneous	5	53	1	1	0	0				
Sick Leave	0	1	0	0	0	0				
Nonunit										
Continuity of Service	0	1	0	0	0	0	0	0	0	0
Overtime Rates	0	0	0	0	0	0	0	0	0	1
Wage Rates	0	2	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	1	0	1	0	0
Working Conditions	0	1	0	0	0	0	0	0	0	0
Work Assignment	0	0	0	0	0	0	0	1	0	1
Holidays	0	1	0	0	0	0	0	0	0	0

Construction Liaison

The Operating Engineers employed by the J. A. Jones Company on minor construction who walked off the job on May 24 returned to work on June 7 thereby averting a general shutdown of the minor construction operation. The dispute was not settled and discussions are being continued. The last meeting took place June 28 but the details are not known.

Employee & Public Relations

SALARY & WAGE ADMINISTRATION

In addition to the normal flow of routine work in the Salary & Wage Administration Section, the following work was carried on during June:

1. The salaries of HAPO mechanical engineers were compared with the ASME survey. An appropriate relationship appears to exist.

2. The evaluation score points for 96 reconciled representative positions were compared with the existing relationship between scores and salary levels. The existing relationship continues to be satisfactory.

3. A summary of position titles by salary level and function was prepared.

4. A summary of reports issued periodically by the Section was prepared.

5. A salary standards report of salary levels for representative positions established by reconciliation and survey was prepared.

6. A review of the employee attitude survey results as they relate to compensation was made and efforts are being made to investigate the circumstances where the percent of favorable response was below the HAPO average.

7. A Flexowriter for use with the new IBM 702 equipment was received during the month.

8. The Wage Rate study was continued. Essentially all of the jobs in the semi-technical and manual groups have been ranked. The clerical rankings are nearing completion. Considerable progress has been made toward the development of a pricing structure.

9. The drafting and design wage rate survey covering most of the architectural-engineering firms on the West Coast was completed and distributed to participants.

1205758

Employee and Public Relations Department
Education and Training Section

The report of the Education and Training Section is submitted as follows:

ROTATIONAL TRAINING PROGRAM

Present Assignments

The technical graduates on the Rotational Training Program are assigned to departments as follows:

Department	Last Month	This Month
Engineering		
Pile Technology	6	6
Separations Technology	4	4
Design	3	5
Project	2	2
Manufacturing		
Metal Preparation	1	1
Separations	0	4
Reactor	4	6
Transportation	0	1 *
Radiological Sciences		
Biology	0	0
Records and Standards	0	0
Biophysics	3	4
Financial		
Procedures and Computing	2	2
Employee and Public Relations		
Employee Comm. & Public Relations	0	1 *
Education and Training	0	14 *

* Temporary assignments

Permanent Placements

There were three placements off the Program, as follows: Metal Preparation - 1, Pile Technology - 1, Reactor - 1. Only 1 additional placement is anticipated for July; however, approximately 8 will be placed in August.

1206759

Employee and Public Relations Department
Education and Training Section

Additions

Twenty-eight new trainees reported in June. Most of these trainees did not have clearance at the time they reported. Most of the clearances have now been obtained and the trainees are being placed with the various sections.

An Orientation Program was given in 3 one-half days in order to introduce these new employees to the Company's organization and the functions of the Hanford departments. Included in the Program was a luncheon for all trainees and the Program speakers, and an evening social for the trainees and their wives. Comments solicited from the trainees by formal questionnaires indicated favorable approval of the entire program.

Selective Service

There were 5 losses to the Selective Service, making a total of 66 men lost to Selective Service in the 22 months since the first man was drafted. The losses have been as follows:

Former program members	56
Direct hires	8
Program members	2
Total	66

It is expected that one member of the program will be lost during July due to ROTC training commitments, making a total of 46 lost to this cause in the 5½ years' operation of this program.

Technician Training Program

Applications from approximately 40 outstanding high school graduates have been received from various high schools in the state of Washington for employment on the Technician Training Program. Standards for acceptance on the Program for present employees have been developed and this information is being circulated to appropriate supervisors. The period to July 15 has been reserved for transfer requests by present employees so that their interests can be recognized before hiring any new employees for this program.

University Relations

A synopsis is being prepared covering a large number of engineering papers and addresses delivered by Hanford personnel over the past 2 - 3 years. It is then planned in late September to contact the colleges and universities in this section of the country to provide qualified Hanford speakers for student professional societies meetings and other similar groups. It is anticipated that this program will be of material benefit in promoting the Hanford story in the schools that normally provide Hanford with a considerable number of new graduates in science and engineering.

1206760

Employee and Public Relations Department
Education and Training Section

Summer Programs

All personnel on the various summer programs have now reported and are being assigned. In these groups are 7 college professors, 5 graduate students and 9 juniors, i.e., men between their third and fourth years of college. This Section is guiding and counselling these temporary employees.

SCHOOL OF NUCLEAR ENGINEERING

Spring Semester

Grades for all courses given in the spring term have been received from instructors and recorded. Each person who completed a course has been notified with a personal letter along with his grade card or certificate. About two-thirds of all students authorized us to send a record of their course grade or completion to their respective supervisors with a copy to be included in their personnel records.

The percentage completions in the School of Nuclear Engineering during the past five years are as follows:

Term	Paid Full Fees	Completions	% Completions
Fall 1950	264	178	67
Spring 1951	154	98	64
Fall 1951	313	178	57
Spring 1952	185	132	71
Fall 1952	188	147	78
Spring 1953	132	110	83
Fall 1953	229	171	75
Spring 1954	227	193	85
Fall 1954	277	227	82
Spring 1955	411	349	85

During the past semester, 89% of the graduate students completed their courses, an unusually high percentage. Grades have been sent to all four affiliated universities.

Approval of Courses by Affiliated Universities

Oregon State College and the University of Washington have completed their course and instructor approvals for the spring term. The University of Idaho has received all examinations and problem material on the new courses so that these courses can be approved in their usual fashion. The State College of Washington still has some course approvals in process, but favorable action is expected on these very soon.

With very few exceptions, those courses submitted for university credit have been accepted by the universities.

1206761

Employee and Public Relations Department
Education and Training Section

Visits by University Representatives

Dr. L. C. Cady, Dean of the Graduate School at the University of Idaho visited Richland very briefly on June 23. He picked up the grades and new course material at that time.

Tentative plans for visits next year were discussed along with required visits of students to the campus. The latter will be affected by the abandonment of Saturday morning hours by the University of Idaho.

Student Opinion Survey

The School developed a questionnaire to be sent to all spring term students, inviting their comments and suggestions on the conduct of classes; quality of instruction, courses which might be added to the curriculum and personal preferences for course work next year. At this time approximately 50% have replied generally favorably. The results will be tabulated in the near future and the suggestions will be studied carefully to see where and how the School may be improved.

Plans for the 1955-1956 Year

Courses in the School curriculum next year will include most of the courses that have been offered in previous years. However, some new courses are under consideration, i.e. -

1. Numerical Analysis and Digital Computers
2. Industrial Power Systems
3. Statistical Mechanics
4. Radiation Engineering
5. Process Instrumentation and Control

With growing emphasis on Nuclear Engineering, the school is continuing to offer courses which combine fundamental value with a direct bearing on Hanford techniques and problems.

School Audit

During the past few weeks the School of Nuclear Engineering has been undergoing an audit by the Financial Department. While the completed report has not been issued, the school activity received favorable approval from the auditor, with several minor recommendations which will strengthen the school operation. Due to our large spring enrollment the cost per student per semester was reduced over previous years although some individual expenses increased.

	1953-4	1954-5
Students completing a one-semester course	393	687
Percentage of completions by those who paid tuition	85%	85%
Net cost per student - semester		
- on basis of comparable expenses.	$58.	$36.
- on basis of total expenses	$63.	$52.*

- *Rent and assessed charges were raised substantially.

1206762

Employee and Public Relations Department
Education and Training Section

During the month, further progress was made in recording systematically the operating procedures of the School. This material is 85% complete with only a small part still to be written.

PERSONAL DEVELOPMENT

Summary and Trends

Training programs in human relations, supervisory methods, and economics are gaining increased acceptance among the major sections. Total attendance of 252 during June is 25% above the year-to-date average. To obtain wide coverage, brief programs are being offered through our correspondents in the larger sections; emphasis is on meetings at the work locations to save the time of those attending. Average length of training meetings has been reduced substantially from that of 1954, so that greater coverage is obtained with fewer total man hours away from normal duties.

Specific activities included the following:

The third and final session of a special presentation of Effective Human Relations was conducted on May 26 with ten exempt personnel of the Financial Department completing the conference. The second session of the regularly scheduled Effective Human Relations program was held on June 2 with an attendance of 30 exempt personnel.

Customer Relations - This program was presented eight times during the month with a total of 147 in attendance as shown below:

May 27 - 15 - Metal Preparations Section, 300 area
May 25 - 4 - Transportation Section
May 31)
June 1)- 23 - Transportation Section
June 14 - 78 - in two groups - Purchasing and Stores Section plus the film "Telephone Courtesy"
June 20 - 16 - Metal Preparations - 300 Area
June 21 - 11 - 200-W Area

Your Stake in American Industry - was offered May 27 (on a regularly scheduled basis) to 24 exempt personnel and again on June 21 to 16 exempt personnel. A special preview session was presented by D. W. McLenegan and V. J. Byron on June 16 to 16 members of the Metal Preparations Section staff. This session ran for approximately 1½ hours.

Job Relations Development was conducted June 10 in 200-W at the request of Redox Radiation Monitoring Unit and there were seven supervisors present.

1205763

Conference Leading program was held on Wednesday, June 22, with 16 people participating.

Responsibility for the Supervisors Handbook of Employee Relations has been transferred to the Communications and Public Relations Section by agreement between C. N. Gross and D. W. McLenegan. Following a survey among representative holders of this manual, a proposal was prepared and transmitted outlining subjects which would meet field needs without duplicating the O.P.G. system.

V. J. Byron presented "The Why of Human Relations" to 108 members of the American Institute of Banking at Yakima, on Thursday, June 9. As one of a series of similar talks presented before neighboring groups, this was well received.

Mr. D. V. Smith has been on part-time loan to the Project Section, Engineering Department. His work of editing parts of project histories was completed during June.

During June, the participation of 409 employees in training programs was summarized for their respective supervisors.

GENERAL

On June 15-17, D. G. Dayton attended the annual meeting of the American Society of Training Directors in Los Angeles. Discussions with other industrial people afforded a review of trends and improvements in employee training activities.

To survey progress in nuclear engineering education, D. W. McLenegan attended the annual meeting of the American Society for Engineering Education June 20-23 at State College, Pennsylvania. This trip also provided opportunity to review training developments with J. J. McCarthy of E&PCR Services, New York.

1206764

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
JUNE 1955

General

Personnel Changes

Five additions and eleven deletions resulted in a decrease to 228.

Employee Relations

Employee attendance at 29 meetings was 190.

Visits

O. E. Bakko attended a meeting of the Board of Trustees of the Washington State Hospital Association in Seattle and a meeting of the Southeast Council of this association in Dayton. One sanitarian attended a state health department meeting in Sunnyside on swimming pool operation.

Industrial Medicine

Dispensary visits changed little from 5739 to 5736, while medical examinations increased from 874 to 1206. Thirty per cent of these examinations were for contractor employees.

Physician shortage, inadequate examination space and increased pre-employment examinations for both General Electric and contractors have resulted in a reduction in periodic employee physical examinations to about half the number which our approved schedule calls for. A project proposal designed to remedy the space deficiency is in process of preparation.

Sickness absenteeism was 1.23% vs. 1.50% for May while total absenteeism was vs. 2.29% for May. The year to date total absenteeism of 2.36% compares with 2.52% for 1954.

Safety & Fire Prevention

	Operations		Community	
	June	To Date	June	To Date
Major Injuries	1	3	0	0
Sub-Major Injuries	1	11	0	0
Total Injuries	441	2629	32	164
Frequency		0.35		0
Severity		33		0

The first major injury within Operations in 143 days occurred on June 21. The accumulated man hours were 6,755,342 and resulted in the winning of the Central Safety Council award. This allows each Operations employee to select one of several gifts.

Total injuries and near serious accidents continued high and indicate a need for greater safety efforts if our good record is to be maintained.

Kadlec Hospital

The average daily adult census decreased from 56.4 to 49.1 as compared to 60.3 a year ago. In spite of the low census hospital losses were some $3,000 less than the budget figure due to economy measures.

1206765

HEALTH & SAFETY SECTION

JUNE 1955

General (Continued)

Public Health

There was a decrease in communicable diseases. Two inoculations of some 695 of 1600 eligible school children against poliomyelitis was completed without incident.

The chest x-ray program with the mobile equipment resulted in a high coverage for all Richland residents. The percentage coverage will be reported later.

An increase in adult mosquitoes has been due to high water inaccessible to ground equipment and to weather which is adverse to fogging operations.

Bacteriological results of pasteurized milk products from three plants showed high counts in six products. Rechecks are being made.

Costs-May

	April	May	May Budget
Industrial Medicine	$45,186	$46,344	$49,982
Public Health (Oper.)	8,444	8,495	10,117
Kadlec Hospital (Net)	22,021	16,290	19,894
Hospital Expense Credits	1,781	1,718	2,000
Safety and Fire Prevention	12,269	12,513	13,888
Total Health & Safety	$89,701	$85,360	$95,881

The net cost of operating the Health and Safety Section before charges were assessed to various departments was $85,360, about $4,400 less than April costs and $10,500 below the budget. In spite of continued low census at Kadlec, the loss was lower than the budget expectation due to drastic reduction in expense. All units were operated within the budget.

1206766

HEALTH & SAFETY SECTION

JUNE 1955

Industrial Medical Services

The total number of dispensary visits was 5736 as compared to 5739 the previous month. The total number of medical examinations increased from 874 to 1206. Of the 1206 total, 849 were General Electric employees and 357 were contractor employees. General Electric employees sustained one major injury and one sub-major. Contractor employees sustained no major and one sub-major injury. There were 29 nurses and one nurse aid on the non-exempt roll.

An Industrial Physicians Staff meeting was held on June 29th. Dr. Wager of the Biology section discussed with the aid of microscopic slides the effect of radioactive particles in the lungs of experimental animals.

Commission approval has been obtained to enter into a contract with Dr. Gough of the University of California. This will permit us to expand the scope of preplacement medical examinations with techniques designed to help identify potential delinquent and troublesome behavior.

Equipment was received to expand hearing tests to include, when indicated, speech audiometry. This will more accurately test the ability to hear and understand conversation than is possible with the "pure tone" method.

A reduced physician staff because of procurement problems, limited examination space facilities, an increased load of General Electric and contractor preplacement examinations, so far this year has reduced by approximately one-half the number of periodic examinations which normally should have been completed to date. In actual numbers this amounts to about 2500 examinations due to date not completed. The increase in employment examinations so far this year as compared to last year has been about 1200.

Locations where mandatory personnel ear protection was recommended have been reviewed. It has been recommended that these revised locations be given the same control as is carried out for eye protection.

The Health Activities Committee met on June 16 and the health topic on "Memory" was presented. Material on this subject was prepared for distribution throughout the plant.

Net costs for the month of May were $415 less than April costs, although gross costs increased $1343. This resulted from a substantial increase in expense credits for services rendered to construction contractors in connection with physical examinations and first aid services. Travel expense booked during May amounted to $683 representing costs incurred in connection with the Industrial Medical Association meeting held in April. No significant changes occurred in other categories of cost.

1206767

HEALTH & SAFETY SECTION

JUNE 1955

Industrial Medical Services (Continued)

Costs-Operations

	May	April	Increase (Decrease)
Salaries	$34,530	$33,751	$ 779
Continuity of Service	2,591	2,531	60
Laundry	167	187	(20)
Utilities, Transportation, Maintenance	4,699	4,399	300
Supplies and Other	5,362	5,138	224
Total Gross Costs	47,349	46,006	1,343
Less: Revenue	1,005	820	185
Expense Credits	12,555	10,982	1,573
Net Cost of Operation	$33,789	$34,204	$ (415)

Net cost of operations for eleven months amounted to $389,000 as compared with the budget of $419,000, an underrun of 7.3%.

1206768

HEALTH & SAFETY SECTION

JUNE 1955

Industrial Medical Services (Continued)	May	June	Year to Date
Physical Examinations			
Operations			
Pre-employment	99	168	817
Rehire	16	21	108
Annual	150	353	1116
Interim	25	21	317
A.E.C.	22	36	158
Re-examination and recheck	131	142	893
Termination	69	108	488
Sub-total	512	849	3897
Contractors			
Annual	0	1	83
Pre-employment	175	193	1032
Recheck	47	34	286
Re-examinations	1	0	1
Termination and Transfer	75	46	249
Interim	64	83	158
Sub-total	362	357	1809
Total Physical Examinations	874	1206	5706
Laboratory Examinations			
Clinical Laboratory			
Government	82	147	609
Pre-employment, Termination, Transfer	2841	3384	16639
Annual	873	1845	6095
Recheck (Area)	82	129	1674
First Aid	29	13	84
Total	3907	5518	25101
X-Ray			
Government	8	16	90
Pre-employment, Termination, Transfer	418	526	2479
Annual	203	420	1626
First Aid	84	88	521
Total	713	1050	4716
Electrocardiographs	71	160	607
Physical Therapy Cases Referred	205	194	1445

1206769

HEALTH & SAFETY SECTION

JUNE 1955

Industrial Medical Services (Continued)	May	June	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	466	655	3167
Occupational Case Retreatments	1846	2145	10469
Non-occupational Treatments	2834	2836	17157
Sub-total	5146	5636	30793
Construction			
New Occupational Cases	112	24	599
Occupational Case Retreatments	321	55	1902
Non-occupational Treatments	160	21	763
Sub-total	593	100	3264
Total First Aid Treatments	5739	5736	34057
Major Injuries			
General Electric	0	1	3
Contractors	1	0	2
Total	1	1	5
Sub-Major Injuries			
General Electric	0	1	11
Contractors	0	1	2
Total	0	2	13
Nurses' Visits			
Calls made	3	3	14
Employee Personal Illness	3	3	11
No. absent due to illness in family	0	0	1
No. not at home when call was made	0	0	2

1206770

HEALTH & SAFETY SECTION

JUNE 1955

Kadlec Hospital

The average daily adult census decreased from 56.4 to 49.1 as compared to 60.3 a year ago. This represents an occupancy percentage of 45.0, broken down as follows: Mixed Service (Medical, Surgical and Pediatrics) 40.0; Obstetrical Service 66.2. A further breakdown of the Mixed Service shows an occupancy percentage of 38.4 on Medical, 51.9 on Surgical and 23.2 on Pediatrics.

The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	24	47
Obstetrical Service	8	18
Total Adult	36	63

The average daily newborn census increased from 11.0 to 13.9 as compared with 11.8 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	4.60
Obstetrical	3.01
Newborn	2.58

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of May was 2.37. When newborn infants are included, the ratio is 1.98.

The net expense for the operation of Kadlec Hospital for May was $16,290 as compared with $22,021 for April. Summary is as follows:

Kadlec Hospital net expense $16,290
This is a decrease of $5,731 from the month of April. It is due primarily to a further personnel reduction which lowered costs and increased revenue due to a longer month. Gross costs decreased $3,094, revenue increased $2,700 and expense credits decreased $63.

O. E. Bakko attended a meeting of the Board of Trustees of the Washington State Hospital Association in Seattle. He also attended a meeting of the Southeast Council of the Washington State Hospital Association in Dayton.

Following is a summary of employee relations meetings held in the Health and Safety Section during the month of June:

	Meetings	Attendance
Hospital	17	103
Industrial Medicine	3	18
Public Health	6	45
Safety & Fire Prevention	1	12
General	2	12
Total	29	190

1206771

HEALTH & SAFETY SECTION

JUNE 1955

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital			
Average Daily Adult Census	56.4	49.1	62.0
Medical	15.5	14.2	17.2
Surgical	20.0	16.6	22.6
Pediatrics	9.9	4.4	11.1
Mixed	45.4	35.2	50.9
Obstetrical	11.0	13.9	11.1
Average Daily Newborn Census	11.0	13.9	11.2
Maximum Daily Census:			
Mixed Services	58	47	83
Obstetrical	19	18	19
Total Adult Census	69	63	95
Minimum Daily Census:			
Mixed Services	30	24	24
Obstetrical Service	7	8	3
Total Adult Census	40	36	36
Admissions: Adult	454	390	2863
Discharges: Adult	458	394	2872
Medical	103	100	691
Surgical	183	144	1210
Pediatrics	85	53	481
Mixed	371	297	2382
Obstetrical	87	97	486
Newborn	75	94	448
Patient Days: Adult	1748	1475	11223
Medical	480	425	3112
Surgical	620	499	4086
Pediatrics	308	133	2012
Mixed	1408	1057	9210
Obstetrical	340	418	2013
Newborn	341	418	2027
Average Length of Stay: Adults	3.8	3.7	4.0
Medical	4.7	4.3	4.5
Surgical	3.4	3.5	3.4
Pediatrics	3.6	2.5	4.2
Mixed	3.8	3.6	3.9
Obstetrical	3.9	4.3	4.1
Newborn	4.5	4.4	4.5
Occupancy Percentage: Adults	51.7	45.0	56.9
Medical	41.9	38.4	46.5
Surgical	62.5	51.9	70.6
Pediatrics	52.1	23.2	58.4
Mixed	51.6	40.0	57.8
Obstetrical	52.4	66.2	52.9
Newborn	42.3	53.5	43.1

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

1206772

HEALTH & SAFETY SECTION

JUNE 1955

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital (Continued)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.56	4.60	
Obstetrics	4.53	3.01	
Newborn	3.27	2.58	
Avg. No. Employees per Patient (excluding newborn)	2.37		
Operations: Major	74	51	388
Minor	58	49	435
E.E.N.T.	56	45	353
Dental	0	2	5
Births: Live	77	95	446
Still	2	2	9
Deaths	4	1	21
Hospital Net Death Rate	.19%	0	.24%
Net Autopsy Rate	75.0	100.0	33.3
Discharged Against Advice	2	1	4
One Day Cases	128	116	961
Admission Sources:			
Richland	84.4	84.1	81.5
North Richland	3.3	1.0	5.8
Other	12.3	14.9	12.7
Admissions by Employment:			
General Electric	74.2	80.3	74.8
Government	4.2	3.1	2.8
Facility	7.9	4.8	6.0
Contractors	4.0	3.1	7.4
Schools	.9	1.3	1.3
Others	8.8	7.4	7.7
Hospital Outpatients:			
First Aid	503	500	2857
Clinical Laboratory	133	145	952
Bacteriological Laboratory	51	30	302
X-Ray	156	176	967
Physical Therapy	322	262	1886
Physical Therapy Treatments			
Outpatient Treatments	335	300	1986
Hospital	85	92	527
Total	420	392	2513
Pharmacy			
No. of Prescriptions Filled	2462	2104	15106
No. of Store Orders Filled	499	493	3016

1206773

HEALTH & SAFETY SECTION

JUNE 1955

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital (Continued)			
Clinical Laboratory Examinations			
Outpatient Examinations	399	320	2437
Hospital	3370	3022	21169
Public Health	0	0	1
Total	3769	3342	23607
X-Ray Examinations			
Outpatient Examinations	170	184	1038
Hospital	224	159	1267
Public Health	0	2	58
Total	394	345	2363
Electrocardiographs			
Outpatient Examinations	5	1	11
Hospital	35	20	164
Total	40	21	175
Bacteriological Laboratory			
Treated Water Samples	225	210	1186
Milk Samples (Inc.Cream & Ice Cream)	32	32	200
Other Bacteriological Tests	443	323	2894
Total	700	565	4280
Patient Meals			
Regulars	2692	2735	17272
Children under 8	618	271	4327
Specials	616	461	4312
Softs	523	397	3454
Tonsil and Adenoid	89	68	511
Liquids	94	142	812
Surgical Liquids	86	67	485
Total	4718	4141	31173
Cafeteria Meals			
Noon	1462	1282	9488
Night	276	243	1717
Total	1738	1525	11205

1206774

HEALTH & SAFETY SECTION

JUNE 1955

Public Health Unit

The incidence of communicable diseases fell off during the month.

The vaccination program against poliomyelitis was completed without incident. About 695 out of 1600 eligible children received this protection. The annual pre-school roundup was held in the elementary schools. In both of these programs, the department was greatly helped by the voluntary services of local physicians.

Another program completed was that of the chest x-ray survey, the results of which are yet to be determined.

The quarterly clinic for handicapped children was held with Dr. C. Don Platner of Walla Walla in attendance.

Of the 241 individual contacts made by the social service counselors this month, 187 were focused on problems of family living, either marital discord or difficulties with children.

In 41 instances, contacts were with adolescents or adults who were concerned with personal problems in areas of inter-personal relationships.

In 9 instances help was given to families having problems of physical or mental illness and in 4 instances the need for temporary financial assistance was met.

Routine inspection of food handling establishments was made. Results were satisfactory with the exception of two restaurants in which Grade B cards were posted. One new drive-in was approved for operation. Plans were inspected and approved for a new drive-in restaurant and fruit market. Plumbing layout for new tavern was inspected and approved. Six itinerant restaurants were inspected and permits issued.

A sanitarian attended a one day course in Sunnyside on swimming pool operation conducted by the State Health Department. Plastic water pipes in Desert Inn pool created a great deal of trouble and are now being replaced with steel pipe. Filter and chlorination systems are now working satisfactorily. Bacteriological results of swimming pools have been satisfactory.

Eighteen Grade A dairy farms were inspected. Bacteriological results of pasteurized milk samples showed high bacteria and coliform counts in six products. Plants have been notified and rechecks are being made.

Three rodent infestations in the industrial area were inspected and bait was put out as a control measure.

An increase in the prevalence of adult mosquitoes was noted. This is largely due to the high water which is unaccessible to ground equipment. Fogging operations have been hampered by adverse weather.

1206775

HEALTH & SAFETY SECTION

JUNE 1955

Public Health (Continued)	May	June	Year to Date
Education			
Pamphlets distributed	10,989	11,988	73,980
News Releases	18	6	57
Staff Meetings	0	1	5
Classes	9	5	78
Attendance	167	50	1,088
Lectures & Talks	2	1	50
Attendance	27	40	2,470
Films Shown	34	12	122
Attendance	838	100	4,519
Community Conferences & Meetings	12	14	80
Radio Broadcasts	9	9	42
Immunizations			
Diphtheria	0	9	235
Diphtheria Booster	0	265	914
Diptussis	0	0	15
Tetanus	0	0	1
Tetanus Booster	0	264	274
Pertussis	0	0	1
Pertussis Booster	0	261	271
Smallpox	0	265	1,644
Tuberculin Test	13	0	33
Immune Globulin	10	19	80
Other	0	0	1
First Polio Series	0	795	795
Second Polio Series	0	374	374
Social Service			
Cases carried over	82	73	560
Cases admitted	11	15	86
Cases closed	20	18	125
Remaining case load	73	70	521
Activities:			
Home Visits	1	0	7
Office Interviews	246	241	1,838
Conferences	36	57	316
Meetings	9	13	82
Sanitation			
Inspections made	129	111	702
Conferences held	17	17	147

120677b

HEALTH & SAFETY SECTION

JUNE 1955

Public Health (Continued)	May	June	Year to Date
Communicable Diseases			
Chickenpox	21	22	196
Erysipelas	0	1	1
German Measles	7	7	56
Impetigo	3	0	6
Influenza (U.R.I.)	0	0	4
Infectious Mononucleosis	0	0	9
Infectious Hepatitis	0	3	13
Measles	4	0	19
Meningitis	1	0	2
Mumps	81	33	419
Pinkeye	1	0	7
Pneumonia	0	0	1
Rheumatic Fever	1	0	1
Ringworm	0	0	11
Roseola	6	3	17
Scarlet Fever	19	2	118
Strep. Infection (Throat)	0	0	1
Tuberculosis	2	1	6
Whooping Cough	0	0	9
Total	146	72	896
Total No. Nursing Field Visits	333	153	2,590
Total No. Nursing Office Visits	43	23	274

1206777

COMMUNITY SECTION

JUNE 1955

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Community Administration	1	1	1	1
Maintenance & Renovation Unit	9	144	9	146
Police Unit	16	29	16	29
Commercial & Residential Property Unit	7	24	7	24
Fire Unit	65	0	62	0
Transfer Study	1	0	1	0
Community Operations Administration	1	1	1	1
Electrical Unit	5	16	5	15
Engineering Unit	7	4	7	4
Water & Sewerage Utilities Unit	5	22	5	22
Library Unit	3	10*	3	10*
Public Works & Recreation Unit	7	44	7	54
	127	295	124	306

	Exempt	Nonexempt
Additions to Payroll	0	16
Transfers In	1	4
Removals from Payroll	1	3
Transfers Out	3	6

Net Increase 8

*Includes two half-time employees.

1206778

MAINTENANCE AND RENOVATION UNIT

June, 1955

		Exempt	Nonexempt
Employees -	Beginning of month	9	144
	New hires	0	2
	Reactivate from illness leave	0	1
	Retirement	0	1
Employees -	End of month	9	146

GENERAL:

Office dormitory units W-10, W-17, W-20 and W-21, and buildings 770, 770-A and 770-B were completely painted on the exteriors for the Auxiliary Operations and Plant Protection Section.

1200779

INTERIOR PAINT REPORT - FY 1955

FOREMEN: R. A. Chambliss
B. C. Bain
M. E. Tappan

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	113	3	113	0
B	160	2	160	0
C	10	1	10	0
D	0			
E	6	0	6	0
F	36	2	36	0
G	0			
H	67	1	67	0
K	4	0	4	0
L	1	0	1	0
M	1	0	1	0
Q	5	1	5	0
R	1	0	1	0
S	2	1	2	0
T	3	0	3	0
U	18	0	16	2
V	46	0	39	7
Y	96	1	90	6
Z	6	0	6	0
1BP	66	0	60	6
2BP	454	1	413	41
3BP	316	0	298	18
Tract	17	0	10	7
1BR Apt.	12	0	11	1
2BR Apt.	0			
W-13 Apt.	1	0	1	0
TOTAL	1441	13	1353	88

13 Units added.

Est. MH B. F.	59,043	Actual MH B. F.	58,807
Est. MH This Mo.	728	Actual MH This Mo.	831
Total Est. MH	59,771	Total Actual MH	59,638

1266780

EXTERIOR PAINT REPORT - FY 1955

FOREMEN: R. A. Chambliss
D. W. Lukins
M. E. Tappan

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	264	41	245	19
B	188	19	187	1
D	3	2	2	1
E	24	6	24	0
F	68	10	68	0
G	5	5	5	0
H	95	5	95	0
L	40	4	39	1
1BP	21	5	7	14
2BP	105	45	62	43
3BP	33	9	20	13
Tract	16	2	14	2
Dormitories	23	0	0	23
TOTAL	885	153	768	117

Est. MH B. F.	32,421	Actual MH B. F.	31,213½
Est. MH This Mo.	6,063	Actual MH This Mo.	4,685½
Total Est. MH	38,484	Total Actual MH	35,899

Spray time 4-21-55 to date: 1944 manhours.

1206781

PLUMBING SHOP

FOREMAN - F. L. Elsensohn

Electric water heaters replaced	11
Laundry trays replaced	6
Miscellaneous work orders completed	26
Cleared major sewer stoppages caused by tree roots	76
Cleared major sewer stoppages in main sewers for Public Works	8
Plumbing for floor and sink linoleum replacements	121
Completely overhauled radiators in dormitories	19
Steam work orders completed	2
Steam work orders on relief valves	24
Filled holes and planted grass seed where trees were removed	55 orders
Repaired blacktop walks	23 orders
Worked on plumbing service orders	23.9 hours
Loaned one Plumber to Public Works	81 hours

Made routine steam inspection once each week in Government owned facilities, dormitories and apartments.

Excavated with backhoe machine and handwork for the cleaning out of roots in sewer lines, and to repair all leaking and broken underground piping, and backfilled.

Landscaped where sewers and other lines were dug out and trees were removed, and seeded excavated portions.

SERVICE ORDER CREW

FOREMAN - L. F. Carpenter

A.	Service orders on hand at beginning of month	633
B.	Received during the month	1907
C.	Completed during the month	1852
D.	On hand at end of the month	688

E. A total of 129.7 hours were spent on work orders.

F. Backlog of incomplete service orders by craft:

Electrical	385	fire inspections
	166	routine
Plumbing	123	
Carpentry	14	
Total	688	

1206782

RENOVATION AND LABOR CREW

FOREMAN - B. C. Bain

The following services were performed during the month:

Houses renovated	53
Trash pick ups	44
Minor carpenter repairs to houses	33
Minor carpenter repairs to dormitories	7
Dormitory rooms redecorated	0
Renovation minor paint jobs	21
Complete paint jobs	1
Redecorated following a fire	1
Houses sprayed for insect control	3
Dormitories sprayed for insect control (W-7)	1
Floors cleaned and sealed in renovation houses	23

Provided weekly service of delivering linens and janitorial supplies to occupied dormitories.

Provided weekly pickup and delivery of laundry from various General Electric Company units to Richland Laundry and Dry Cleaners.

MECHANICAL SHOP

FOREMAN - Z. H. Mayberry

A. Millwright Crew:

Furnace service orders	78
Routine furnace inspections	211
Refrigerator units changed out	6

B. Sheetmetal Crew:

Replaced smoke pipes	17
Shower stalls installed	13
Replaced gutters	14
Installed ranch house coal hatch flashings	9
Installed ranch house bathroom window flashings	120

C. Labor Crew:

Tree removal orders	31
Removed stumps	7
Removed trees and limbs cut by tenants	9
Topsoil loads delivered	14

1206783

LINOLEUM AND CARPENTER SHOP

FOREMAN - R. M. Martin

Replaced bath wall tile	16
Repaired bath wall tile	4
Replaced bath floor linoleum	24
Replaced living room floor linoleum	2
Replaced dining room floor linoleum	2
Replaced kitchen floor linoleum	26
Replaced hall linoleum	1
Replaced steps linoleum	17
Replaced sink top linoleum	87
Repaired sink top linoleum	1
Replaced work bench linoleum	11
Jack and shim	1
Repaired porches	82
Replaced sinks	4
Thresholds	14
Raised slabs	3
Chempoints	65
Paint touch ups	36
Doors repaired - exterior	1
Interior house repairs	2
Repaired walls	2
Sidewalk forms	2
Repaired roofs	20
Ranch house window screens	53
Ranch house ladders	15

1205784

COMMUNITY SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
JUNE 1955

ORGANIZATION

	EXEMPT	NON-EXEMPT
EMPLOYEES - BEGINNING OF MONTH	16	29
TRANSFERS IN	0	1
TRANSFERS OUT	0	2
NEW HIRES	0	1
TERMINATIONS	0	0
TOTAL - END OF MONTH	16	29

GENERAL

POLICE PROTECTION IN NORTH RICHLAND WAS DISCONTINUED EFFECTIVE MIDNIGHT, JUNE 30.

TWO POLICE VEHICLES WERE RETURNED TO TRANSPORTATION DURING THE MONTH. THIS WAS MADE POSSIBLE BY REDUCTIONS OF FORCE IN NORTH RICHLAND.

DETECTIVE L. M. LINKOUS AND DETECTIVE H. V. MEIGS CONDUCTED A CLASS COVERING THE SUBJECTS OF "INTERROGATION OF WITNESSES AND SUSPECTS" AND "CRIME PREVENTION TECHNIQUES" FOR COMPANY D, 324TH MILITARY POLICE BATTALION AT THE PASCO ARMORY ON JUNE 7.

A GROUP OF BOYS AND GIRLS FROM THE UNITED PROTESTANT CHURCH SUMMER SCHOOL WAS ESCORTED ON A TOUR OF POLICE HEADQUARTERS DURING THE MONTH OF JUNE.

THE ANNUAL STREET STRIPING PROGRAM WAS BEGUN THIS MONTH AND WAS 80 PER CENT COMPLETED AT THE END OF THE MONTH.

1206785

TRAFFIC	1955		1954		1955	1954
RICHLAND	MAY	JUNE	MAY	JUNE	TOTAL TO DATE	TOTAL SAME PERIOD
REPORTABLE ACCIDENTS	17	22	20	11	119	122
PROPERTY DAMAGE ACCIDENTS	16	19	16	10	105	106
INJURY ACCIDENTS	1	3	4	1	14	16
TOTAL PERSONS INJURED	1	3	4	1	17	16
FATAL ACCIDENTS	0	0	0	0	0	0
ACCIDENTS-DAYLIGHT HOURS	14	19	16	11	87	84
DARKNESS "	3	2	4	0	32	38
ACCIDENTS-BUSINESS DISTRICT	4	10	5	3	32	33
RESIDENTIAL "	10	7	11	7	63	71
OTHER "	3	5	4	1	24	18
ACCIDENTS INVESTIGATED	13	15	13	9	79	72
CRIMINAL COMPLAINTS FILED	10	8	9	9	41	52
VIOLATIONS CONTRIBUTING TO ACCIDENTS:						
NEGLIGENT DRIVING	6	1	2	2	13	23
FAIL. TO YIELD RIGHT OF WAY	3	11	8	7	35	33
FOLLOWING TOO CLOSELY	2	5	2	1	17	23
DRUNK DRIVING	0	0	1	0	2	2
PEDESTRIAN VIOLATION	1	0	3	0	3	3
INATTENTION TO DRIVING	0	0	0	0	2	0
RECKLESS DRIVING	0	0	0	0	1	3
SPEEDING	0	0	0	0	1	1
UNSAFE SPEED	0	0	1	0	18	20
IMPROPER BACKING	0	1	2	1	6	7
DISREGARDING STOP SIGN	2	0	0	0	4	0
HIT AND RUN	1	0	0	0	2	0
IMPROPER PASSING	1	0	0	0	3	0
IMPROPER TURN	0	0	0	0	3	1
FAILURE TO SIGNAL	0	0	0	0	1	1
WIDE RIGHT TURN	0	0	0	0	0	1
BICYCLE VIOLATION	0	3	1	0	3	2
DEFECTIVE EQUIPMENT	1	0	0	0	2	0
WRONG SIDE OF ROAD	0	0	0	0	1	0
ANIMAL IN ROAD	0	1	0	0	2	0
NORTH RICHLAND						
REPORTABLE ACCIDENTS	1	1	8	6	29	48
PROPERTY DAMAGE ACCIDENTS	0	1	5	6	26	40
INJURY ACCIDENTS	1	0	3	0	3	8

RICHLAND	1955 MAY	1955 JUNE	AVE. PER ACCIDENT 1955 MAY	AVE. PER ACCIDENT 1955 JUNE	AVE. PER ACCIDENT 1954 MAY	AVE. PER ACCIDENT 1954 JUNE
ACCIDENT PROPERTY DAMAGE	$3,575.00	$4,271.00	$210.29	$194.14	$176.00	$190.19

1206786

TRAINING

ADVANCE TRAINING FOR RICHLAND POLICE MEMBERS AT THE SMALL ARMS RANGE FOR THE PERIOD IN FIELD INSTRUCTION WAS AS FOLLOWS:

.38 CALIBER REVOLVER	½ HOUR	QUALIFICATIONS ON THE ARMY-L COURSE AS FOLLOWS:					
TOTAL NUMBER OF MEN REPORTING AT THE RANGE	4	EXPERT	2	50%	SHARPSHOOTER	0	0%
NUMBER OF MEN FIRED OVER THE ARMY-L COURSE	4	MARKSMAN	1	25%	UNQUALIFIED	0	25%

ACTIVITIES	MAY		JUNE	
	RICHLAND	NORTH RICHLAND	RICHLAND	NORTH RICHLAND
BANK ESCORTS AND DETAILS	4	0	4	0
BICYCLES IMPOUNDED	1	0	3	0
BICYCLE VIOLATIONS, OTHER	0	0	3	0
BICYCLES REGISTERED	174	0	62	0
CHILDREN LOST OR FOUND	34	5	15	0
COMPLAINTS INVESTIGATED	91	5	83	2
DEATHS REPORTED	0	0	2	0
DOG, CAT, LOOSE STOCK COMPLAINTS	11	3	13	0
DOGS, CATS, REPORTED LOST OR FOUND	7	1	13	0
DOORS, WINDOWS, FOUND OPEN IN FACILITIES	57	12	52	3
EMERGENCY MESSAGES DELIVERED	14	25	18	4
FIRES INVESTIGATED	7	3	12	0
GUNS REGISTERED	8	0	2	0
LAW ENFORCEMENT AGENCIES ASSISTED	8	0	2	0
LETTERS OF INQUIRY	148	0	156	0
MISCELLANEOUS	8	0	17	0
PERSONS INJURED BY DOGS	2	0	3	0
PLANT DEPARTMENTS ASSISTED	16	3	20	0
PRISONERS PROCESSED THROUGH JAIL	12	2	12	2
PRIVATE INDIVIDUALS ASSISTED	57	2	55	0
PROPERTY LOST OR FOUND	18	1	28	0
RECORDS INQUIRIES	50	0	48	0
REPORTS PROCESSED THROUGH RECORDS	156	16	173	18
STREET LIGHTS OUT REPORTED TO ELECTRICAL	122	0	103	0
TRAFFIC SAFETY MEETINGS (JUNE ATTENDANCE 50)	11	0	2	0
TOTAL	1017	78	901	27

1208181

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND-NORTH RICHLAND)
JUNE 1955

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART I								
1. Criminal Homicide								
a. Murder & Non Neg. Mans.								
b. Mans. by Negligence								
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break. & Entry	4	-	3	-	1	-	-	-
6. Larceny Over $50.00	3	-	1	-	-	-	-	-
Under $50.00	22	2	2	-	-	-	4	-
7. Auto Theft	-	3	-	-	-	2	-	-
TOTAL PART I CASES	29	5	6	-	1	2	4	-
PART II								
8. Other Assaults	4	1	-	-	1	1	3	-
9. Forgery & Counterfeit	-	-	-	-	-	-	-	-
10. Embezzlement & Fraud	2	-	-	-	-	-	2	-
11. Stolen Prop:Buy:Receive	-	-	-	-	-	-	-	-
12. Weapons:Carry:Possessing	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	-	-	-	-	-	-	-	-
15. Offenses Ag. Fam. & Child	1	-	-	-	1	-	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	5	-	-	-	-	-	5	-
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	6	-	-	-	-	-	6	-
21. Gambling	-	-	-	-	-	-	-	-
22. Drunk Driving	2	-	-	-	-	-	2	-
23. Viol. Road & Driving Laws:								
Failure to Stop & Identify	2	-	-	-	-	-	1	-
Speeding	44	1	-	-	23	-	21	1
Stop Sign	20	-	-	-	8	-	12	-
Reckless Driving	4	1	-	-	-	-	4	1

1203103

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
Right of Way	10	-	-	-	2	-	8	-
Negligent Driving	10	3	-	-	1	-	9	3
Defective Equipment	20	-	-	-	18	-	2	-
Illegal Passing	-	1	-	-	-	-	-	1
24. Parking	8	-	-	-	5	-	3	-
25. All Other Traffic Viol.	28	2	-	-	20	2	8	-
26. All Other Offenses								
Vandalism	5	1	1	-	2	-	-	-
Malicious Mischief	3	-	-	-	3	-	-	-
Obscenity	1	-	-	-	-	-	1	-
Obscene Phone Calls	3	-	-	-	-	-	-	-
Illegal Shooting	3	-	-	-	2	-	1	-
Public Nuisance	2	-	-	-	-	-	2	-
Viol. of Fireworks Ord.	1	-	-	-	1	-	-	-
Family Disturbance	-	1	-	-	-	1	-	-
Prowler	3	-	-	-	2	-	-	-
Impounded Bikes	2	-	-	-	2	-	-	-
Viol. of Blue Laws	1	-	-	-	-	-	1	-
Lewdness	1	-	-	-	1	-	-	-
Neighborhood Disturbance	1	-	-	-	1	-	-	-
Cruelty to Animals	1	-	-	-	1	-	-	-
Molesting	1	-	-	-	-	-	1	-
27. Suspicion	1	-	-	-	1	-	-	-
TOTAL PART II CASES	195	11	1	-	95	4	92	6
PART III								
28. Missing Persons	5	-	-	-	5	-	-	-
Lost Persons	18	-	-	-	18	-	-	-
Lost Animals	5	-	-	-	1	-	-	-
Lost Property	40	1	-	1	38	-	-	-
29. Found Persons	3	-	-	-	3	-	-	-
Found Property	57	1	-	-	73	1	-	-
Found Animals	7	-	-	-	4	-	-	-
TOTAL PART III CASES	135	2	-	1	142	1	-	-

1 2 0 1 8 9

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OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART IV								
30. Fat.M.V.Traff. Accid.	-	-	-	-	-	-	-	-
31. Pers. Inj. M.V. Traff. Accid.	3	-	-	-	-	-	-	-
32. Prop. Dam. M.V. Accid.	19	1	-	-	-	-	-	-
33. Other Traffic Accid.	-	-	-	-	-	-	-	
34. Public Accidents)								
35. Home Accidents)	No Accurate Statistics Kept							
36. Occupational Accidents)								
37. Firearms Accidents	-	-	-	-	-	-	-	-
38. Dog Bites	-	-	-	-	-	-	-	-
39. Suicides	-	-	-	-	-	-	-	-
40. Suicide Attempts	-	-	-	-	-	-	-	-
41. Sud. Death & Bod. Found	1	-	-	-	-	-	-	-
42. Sick Cared For	-	-	-	-	-	-	-	-
43. Mental Cases	-	-	-	-	-	-	-	-
TOTAL PART IV CASES	23	1	-	-	-	-	-	-
COMPOSITE TOTALS								
PART I,II,III,IV CASES	382	19	7	1	238	7	96	6

Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: orders from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column only in that there was no arrest.

Property reported stolen	Richland	$3,131.25
Property recovered	Richland	$2,666.25
Property reported stolen	No. Rich.	$ 50.00
Property recovered	No. Rich.	--

MONTHLY REPORT RICHLAND POLICE DEPARTMENT JUVENILES INVOLVED JUNE 1955

OFFENSES	NO. CASES	JUVENILES	SEX	5	8	9	10	11	12	13	14	15	16	17
RICHLAND														
Larceny	5	6	M					1		1	1	1		2
		2	F									2		
Malicious Mischief	1	3	M	1	1	1								
Vandalism	2	6	M				2					3	1	
Fireworks Violation	1	1	M									1		
Prowler	2	5	M									1	4	
Lewdness	1	1	M										1	
Cruelty to Animals	1	2	M					1	1					
Molesting	1	1	M								1			
TOTALS	14	27		1	1	1	2	2	1	1	2	8	6	2

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RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
JUNE 1955

VIOLATIONS	NO. OF CASES	NO. OF CONV.	NO. OF FORF.	CASES CONT.	CASES DISM.	SENT. JAIL	SENT. SUSP.	LIC. REV.	CASES ORIG. PREV. MONTH	BAIL FORF.	FINES	FINES SUSP.	
DEFECTIVE EQUIPMENT	2	2									$7.50	$5.00	(1)
IMPROPERLY DISPLAYED VEH LIC	1	1									3.50		
INVALID VEHICLE LIC	1												
NO. VEH LIC DISPLAYED	1												
NO DRIVER'S LIC	8	6	1							$5.00	28.50	5.00	(1)
DRIVING WHILE LIC REVOKED	1												
INATTENTION TO DRIV	1				1								
NEGLIGENT DRIVING	5	4		1					1		82.50	10.00	(1)
NEG DRVG, LIQ INVOLVED	6	2	1	1	1			1	1	50.00	52.50		
RECKLESS DRIVING	3	1		1				1			50.00		
RECKLESS DRIV, LIQ INV	1	1						1			25.00		
DRUNK DRIVING	2	1			1		1		1		152.50		
SPEEDING	18	11	7							75.00	76.50	2.50	(1)
STOPPING ON ROADWAY	1		1							5.00			
ILLEGAL PARKING	3		1		1					3.50			
STOP SIGN	12	8	3		1					25.00	49.00		
FAIL. YIELD RIGHT OF WAY	8	5	2					1		30.00	105.00	25.00	(1)
FAIL TO STOP & IDENTIFY	1				1								
PETIT LARCENY	1	1				1							
LARCENY BY CHECK	1	1				1	1						
3RD DEGREE ASSAULT	2	2				1	1				2.50	10.00	(1)
VAGRANCY	4	3	1			2				25.00	15.00		
CREATING A PUBLIC NUISANCE	1		1							25.00			
PUBLIC INTOXICATION	4	2	2			2				25.00			
CONTRIBUTING TO DELIQ OF MINOR	1	1									5.50		
SABBATH BREAKING	1	1									25.00		
TOTALS	90	53	20	3	6	7	3	4	3	268.50	680.50	57.50	(6)

1 RECKLESS DRVG - CHANGE OF VENUE
1 INV. VEH PLATES - LEFT JURISDICTION
1 NO VEH LIC DISPLAYED - LEFT JURISDICTION
1 LARCENY BY CHECK - 30 DAYS - 23 SUSP IF RESTITU. MADE
1 DRUNK DRIVING - FINED $152.50 - LIC REV. 5 MOS - 5 DAYS CNTY JAIL, SUSP.
1 ILLEGAL PARKING - DID NOT APPEAR.
1 RECKLESS DRVG - FINED $50 LIC SUSP 60 DAYS, 20 SUSP.
1 FTYROW - COST $2.50 LIC SUSP 1 MO. TO BE HELD BY COURT
1 DRVG WHILE LIC REV - CHANGE OF VENUE
1 NEG. DRVG, LIQ INV - CHANGE OF VENUE
1 DRVG WITHOUT LIC - CHANGE OF VENUE
1 RECKLESS DRV, LIQ INV-F&C $25 LIC SUS 60 DY
1 3RD DEG ASSAULT - 20 DYS CNTY JAIL - 15 SUS. POSTED $250 BOND.

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RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
JUNE 1955

VIOLATIONS	NO.OF CASES	NO.OF CONV.	NO.OF FORF.	CASES CONT.	CASES DISM.	SENT. JAIL	SENT. SUSP.	LIC. REV.	CASES ORIG. PREV. MONTH	BAIL FORF.	FINES	FINES SUSP.
NEGLIGENT DRIVING	3	2	1							$25.00	$15.00	$5.00 (1)
NEG. DRVG, LIQ. INV.	1		1							50.00		
RECKLESS DRVG, LIQ. INV.	1	1						1			77.50	
ILLEGAL PARKING	3	1	2							6.50	2.50	
ILLEGAL PASSING	1	1									7.50	
STOP SIGN	1	1							1		6.50	
FOLLOWING TOO CLOSE	1			1					1			
SPEEDING	2		1		1				1	7.50		
VAGRANCY	2	2				2	2					
PUBLIC INTOX	2	2				2	2					
TOTALS	17	10	5	1	1	4	4	1	3	$89.00	$109.00	$5.00 (1)

1 VAGRANCY - 30 DAYS JAIL - 15 SUSP.
1 PUBLIC INTOX - 30 DAYS JAIL - 15 SUSP.
1 VAGRANCY - 30 DAYS JAIL - 15 SUSP.
1 PUBLIC INTOX - 30 DAYS JAIL - 15 SUSP.
1 RECKLESS DRVG, LIQ INV. - LIC SUSP 90 DAYS.
1 FOLLOWING TOO CLOSE - CONTINUED

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT
COMMUNITY SECTION
June, 1955

PERSONNEL - COMMERCIAL & RESIDENTIAL PROPERTY UNIT:

	Exempt	Non-Exempt
Employees - beginning of Month	7	24
Transfers In	0	0
Transfers Out	0	0
New Hires	0	2
Terminations	0	2
Employees - end of Month	7	24

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
May	1,617	27	115	0	1,732	27
June	1,623	0	117	0	1,740	0
Net Change	+6	-27	+2	0	+8	-27

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Non-Commercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	28	1	1	0	29	1	30
Back Charges	1	0	0	0	1	0	1
FY Work Orders	1034	361	49	0	1083	341	1444
FY Back Charges	43	1	5	0	48	1	49

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Lease:

Hubert R. Moore - a ground lease covering the construction and operation of an automotive service station to be located at the intersection of Van Giesen Street and Wright Avenue.

2. Permit:

Frank B. Hogue Tug and Barge Company - a permit covering the construction and use of landing facilities for the operation of the Richland Ferry.

1206794

3. Business Development:

Invitations to Bid were mailed to 6 prospective Lessees in connection with leasing a plot of land on Wellsian Way in the Heavy Industrial Area. Proposals received will be opened and read July 6, 1955.

NORTH RICHLAND:

North Richland was officially turned over to the U. S. Army as of midnight June 30, 1955. All buildings which had been occupied by facilities were either transferred to the Army or, if privately owned, were removed from the leased premises. Thus ended operations which began in September 1947.

GENERAL:

A. Commercial:

1. Johnny's Drive-In, Farmer's Market, Inc., a sublessee of E. H. Kidwell, started construction at the intersection of Lee Boulevard and Duane Avenue.

2. Tide Water Associated Oil Company #3 opened for business on George Washington Way south of Newton Street.

3. The Richland Ferry started operation on the Columbia River approximately 2000 feet north of Snyder Road.

4. The Circus Drive-in opened for business at the southeast corner of Williams Boulevard and Goethals Drive.

5. Tim's Drive-in opened for business at the southwest corner of Williams Boulevard and Goethals Drive.

6. Dr. R. J. Whisler terminated his lease in the Medical-Dental Building.

7. Dr. Frances M. Love terminated her lease in the Medical-Dental Building.

8. Dr. William Freiday terminated his lease in the Diana Langevin Building.

9. Richland Printers opened for business at 89 Lee Boulevard.

10. Ray Ashcraft terminated his sublease in the Richland Development Company Building

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland.

Service Station	Insurance Agency
Restaurant	Ice Cream Vending
Used Car Sales	

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COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION June, 1955

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial

	MAY			JUNE		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Number of Government-owned Buildings	42	6	48	42	0	42
a. Number of Prime Lessee Businesses	37	0	37	38	0	38
b. Number of Sublessees Businesses	17	0	17	17	0	17
c. Total Businesses in Government-owned Buildings	54	0	54	55	0	55
2. Doctors and Dentists in Private Practice	35	0	35	33	0	33
3. Number of Privately-owned Buildings	76	5	81	79	0	79
a. Number of Prime Lessee Businesses	46	0	46	47	0	47
b. Number of Businesses operated by Sublessees	116	0	116	116	0	116
c. Total Businesses in Privately-owned Buildings	162	0	162	163	0	163
4. Privately-owned Buildings under Construction	9	0	9	10	0	10
5. Total Number of Businesses in Operation	216	1	217	218	0	218

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COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION June, 1955

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

B. Noncommercial:

	MAY			JUNE		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Government-owned Buildings						
a. Churches	1	0	1	1	0	1
b. Clubs and Organizations	5	0	5	5	0	5
c. Government Agencies	2	0	2	2	0	2
Total	8	0	8	8	0	8
2. Privately-owned Buildings						
a. Completed and in Use	13	0	13	13	0	13
b. Under Construction	5	0	5	5	0	5
3. Church Plots and Buildings in Private Ownership	4	0	4	4	0	4
4. Pasture Land Permits	101		101	101		101

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

PROGRESS REPORT

	Orders incomplete as of May 31, 1955	Orders issued 5-31 to 6-30	Total orders Incomplete as of June 30, 1955
Service orders	707	1991	793
Work orders	919	467	993
Service charges		292	

Principal work order loads

	Incomplete as of May 31, 1955	Incomplete as of June 30, 1955
Laundry tub replacement	4	16
Tileboard bathroom	42	32
Kitchen floor linoleum	117	112
Kitchen cabinet linoleum	175	170
Shower stall	11	13

---

221 alteration permits were issued as compared to 122 issued in May.

Install automatic washer	33	Install automatic dryer	23
Install patio	9	Install fence	34
Install closet	1	Install cupboard	1
Install TV antenna	28	Install toolshed	6
Install back door	8	Install air conditioner	36
Install partition	1	Install electric heat	4
Install tile on floor	2	Install light	1
Install shelves	1	Remove closet	2
Install carport	1	Remove retaining ledges	1
Install cooling pads	1	Install exhaust fan	1
Install sprinkling system	1	Replace porch	1
Sand floors	2	Remove partition	3
Install clothes poles	1	Convert to oil	5
Remove laundry trays	1	Remove shelf	1
Install 220 heater	1	Basement excavation	3
Install sidewalk	1	Install water softener	1
Move water heater	1	Install additional wiring	3
Reverse range & refer	1	Install dishwasher	1

---

983 inspections were made, as compared to 1212 in May.

Alteration permits	167	Basement	2
Bathroom	11	Doors	9
Floors	15	Laundry trays	6
Linoleum	87	Lot lines	30
Range & refer recall	14	Steps & walks	30
Sink	10	T. Seat	14
Trees	22	Walls	2
Windows	5	Yard	9
Renovation rechecks	53	Dormitories	165
Miscellaneous	12	Cancellations	112
Renovations	116	Shows (new tenants)	92

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COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

TENANT STORES

Merchandise Issued	Total Amount
Shades	807
Reflectors	20
Ice trays	26
Hydrator glass	5
Drip trays	11
Meat tender	5
Range parts	3
Refer parts	3
Door stops	6
Grass seed	18
Furniture delivery	18
Furniture recall	19

RECALL AND DELIVERY OF RANGES AND REFRIGERATORS -- MONTH OF MAY

	DELIVERY		RECALLED	
	REFERS	RANGES	REFERS	RANGES
A	2	0	6	4
B	4	1	4	5
E	0	0	0	1
F	1	2	1	1
H	0	0	0	2
Q	2	1	2	0
R	1	1	1	1
S	2	0	2	1
V	1	0	1	0
Y	10	3	4	1
2Br.	5	3	1	1
3Br.	2	1	5	2
Tract	0	0	1	1
Apt.	0	0	1	1
Total	30	12	29	21

IN WAREHOUSE:

SC ranges ----38
GM ranges ---- 1
GE ranges ---- 8
Hot point ----1

TA refers 7' ---23
GM refers 7' --- 1
GM refers 6' --- 1
GE refers 8' --- 3

1206799

COMMERCIAL & RESIDENTIAL PROPERTY UNIT
RESIDENTIAL LEASES

JUNE 1955

DORMITORY REPORT

Dormitories:

	Beds available	Vacant beds	Occupied beds
Men	477	47	430
Women	381*	112**	269*
Total	858*	159**	676*

*This includes 2 beds used for Dorm offices
**This includes 32 beds vacant in Dorm M-13

Waiting Lists

	Single Rooms	Double Rooms
Men	0	0
Women	0	0

The following Dormitories are in stand-by condition:

W 16 50 beds
W 15 50 beds
M 7 39 beds

Total beds 139

Released for temporary office use:

W 21 50 beds
W 17 50 beds

Total beds 100

RESIDENTIAL LEASING

CANCELLATIONS		ALLOCATIONS	
Voluntary terminations	23	Houses allocated to new tenants	68
R. O. F.	0	Exchanged houses	10
Discharge	0	Moves (within Richland)	29
Transfers	13	Turnovers (divorce, death, schools)	2
Retirement	2	Wherry house move to GE house	0
Move off project	31	Total leases signed	109
Divorce	1	Total cancellations	118
Death	1	Houses assigned "As Is"	36
Move to Wherry house	2	Houses sent to "Renovation"	64
Military Service	3	Applications pending	702
Marriage	1		
	77		

1206600

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING
HOUSES OCCUPIED BY FAMILY GROUPS

	Conven.	A&J	T	Fre Cut	Ranch	Fre Fab	Dorm Apt.	A&J Apt.	2BR Apt.	4th Hsg.	Tract	Total
G. E. Employees	2214	259	10	398	868	1116	8	54	60	207	35	5229
Comm. Fac.	96	19		25	55	52		6	4	8	2	267
AEC	64	28		18	44	22	2	3	4	10	3	198
Other Gov't.	12	2			4	3						21
Post Office	8				2	8					2	20
Schools	65			6	11	43			1	1		127
Comm. Activities	9			2	6	5						22
Med. Facilities	4	16			3	2				3		28
Kaiser Eng.	1	3										4
J. A. Jones	3	3			2							8
Blaw-Knox		1			1							2
Minor Const.						1					1	2
Not Certified	3				4	4					1	12
Total	2479	331	10	449	1000	1256	10	63	69	229	44	5940
Ready to Rent	1	1				6		1				9
In Renovation	20	1		1		14			1	1		38
Boarded Up											2	2
Total	2500	333	10	450	1000	1276	10	64	70	230	46	5989

	Begin Month	Moved In	Moved Out	End of Month	Difference
Conventional Type	2483	+ 28	-32	2479	-4
A&J Type	333	+ 7	- 9	331	-2
"T" Type	10			10	
Precut Type	448	+ 8	- 7	449	+1
Ranch Type	998	+ 15	-13	1000	+2
Prefab Type	1257	+ 35	-36	1256	-1
Dorm Apts.	8	+ 3	- 1	10	+2
A&J Apts.	64	+ 1	- 2	63	-1
2BR Apts.	68	+ 3	- 2	69	+1
Fourth Housing	229	+ 1	- 1	229	
Tracts	45		- 1	44	-1
Total	5943	+101	-104	5940	-3

1200001

COMMUNITY SECTION
RICHLAND FIRE DEPARTMENT
MONTHLY REPORT

JUNE 1955

Organization and Personnel	Exempt	Non-Exempt
Employees beginning of Month	65	0
Transfers In	1	0
Transfers Out	1	0
Terminations	3	0
New Hires	0	0
End of Month	62	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$ 0.00	$ 20.00
	Personal	0.00	0.00
	June Total	$ 0.00	$ 20.00
	Year's Total	$3,983.87	
Response to Fire Alarms		34	11
Investigation of Minor Fires and Incidents		0	0
Ambulance Responses		20	0
Inside Schools or Drills		15	9
Outside Drills		3	4
Safety Meetings		6	4
Security Meetings		4	2
Fire Alarm Boxes Tested		203	96

A total of 1175 residential fire inspections were completed during June, making a total of 2822 inspections completed to date. All Wherry Act housing units were visited during June but a high percentage of "no answers" were encountered in these units.

Fire Department tank truck responded June 18, to a residential fire two miles west of the Richland "Y" but could save little property because of the delay in receiving the call.

A number of instruction classes and technical drills with fire apparatus were held during June in North Richland to orient Army civilian personnel in the North Richland alarm system and apparatus in preparation for the Army's responsibility for North Richland fire protection starting July 1.

One truck responded June 14, at the request of the West Richland Fire Department to assist on a large grass fire threatening structures

1266002

Fire Marshal's Monthly Report

A total of 320 Richland and 94 North Richland buildings were inspected, resulting in 41 hazard reports being submitted. A total of 587 fire extinguishers were inspected, 3 installed and 7 removed. Also 35 fire hose standpipes were inspected and serviced.

With AEC and GE officials, investigated corroded sprinkler heads in acid laboratory of 747 building and requested Landlord replace heads with a type suitable for use in presence of acid fumes.

Compiled and submitted News release on Fire Code regulations for storage and dispensing gasoline in unapproved containers. Sent a letter to each garage and service station citing the requirements.

Conducted two fire extinguisher demonstrations for a total of 41 employees of Kadlec Hospital and Bio-Assay Laboratory.

Assisted AEC and GE Engineers with acceptance tests of contractual work in 413 Building, which included operational test of interconnected air conditioning and fire alarm system.

Inspected a residence where the tenant had installed unsafe wiring and covered basement ceiling and partition walls with cardboard packing box material. Due to the potential fire hazard, requested Housing have it removed.

Reviewed plans for a grease hood in the C.V.P. Church school. Plans were approved providing existing duct is insulated to conform with Building Code.

Advised Stores and Transportation supervision that the 3000 Area fire alarm boxes in warehouse and salvage areas were connected to Richland system and requested they advise their employees and install emergency fire phone number at all telephones.

Sixty children attending a church summer school at Lewis and Clark School heard a fire prevention talk by a fire Captain on June 13.

Fifty employees of Personnel Accounting Unit heard an Assistant Fire Chief talk on Home Fire Safety at their June 21st Safety Meeting.

1206003

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
JUNE 1955

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees Beginning of Month	5	16
Transfers In		
Transfers Out		1
Terminations		
Total End of Month	5	15

SYSTEM MAINTENANCE AND OPERATION

OUTSIDE LINES:

Poles set	13
Anchors Set and guys installed	3
Street lights repaired	10
Street lights relamped - mercury vapor	8
Street lights relamped - 6000L and 4000L, 1100 Area	98
Street lights relamped - 6000L and 4000L, 700 Area	7
Flood lights relamped, 1100 Area	32
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	0
Primary line footage added	0
Primary line footage removed	0
Transformer KVA added	250
Transformer KVA removed	312.5
Net transformer KVA removed	62.5
New services installed - residential	0
New services installed - commercial	4
Residential services removed	0
Temporary services installed and removed	2
Scheduled outages - primary	2
Scheduled outages - secondary	6
Unscheduled outages - primary	1
Unscheduled outages - secondary	0
Standby and escort	2
High voltage tree trimming	11
Low voltage tree trimming	21

TRAFFIC SIGNALS

Relamping	0
Operational failures	4
Installations	0
Removals	0

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RICHLAND ELECTRICAL UNIT

Routine maintenance checks	66
Routine check R. R. Signal at Van Giesen	4
Total signals in operation - automatic	19
Total signals in operation - manual	5
Total signals in operation - flasher	3

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	15
Electrical motors checked and serviced - water	39
Electrical motors checked and serviced - sewage	64

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	6
Outside circuit checks	4
Inside faults repaired	0
Outside faults repaired	4
New circuits placed in operation	0
New boxes placed in operation	1

SUBSTATIONS

Main feeder and tie breaker checks - Thayer Drive	4
Main feeder and tie breaker checks - Stevens Drive	4
Secondary and pad located stations - checked jumpers, cutouts, grounds and general condition	26

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Voltage and load checks	3
Meters tested - customer's requests	1
New meters shop tested	45
Faulty meters replaced or repaired	5
Damaged meters and covers	1
Residential read-ins	197
Residential read-outs	196
Residential disconnects	12
Residential reconnects	11
Meters resealed	1
Radio interference checks	2
Overloaded meters changed out	46
Routine meter tests	58
Replaced Roller-Smith meters with Sangamo	25

Consumption and Revenue	No. of Meters	KWH	Revenue
Residential - Schedule 1	6984	6,190,076	$61,405.04
Commercial - Schedule 2	407	3,376,949	26,833.04
Total	7391	9,567,025	$88,238.08

1206605

RICHLAND ELECTRICAL UNIT

COMMENTS

STREET LIGHTING:

Re-routed underground street light circuit to clear tenants fence posts rear of 908 Chestnut.
Replaced two street lighting luminaires damaged by vandalism in Hunt Point area - Persons causing damage were apprehended by Police Dept.
The usual routine relamping and control maintenance was performed during the month including replacement of photocell to #200 station.
Replaced photocell to #2100 Station
Installed new fuse to #1300 Station

TRAFFIC SIGNAL SYSTEM:

Re-adjusted master traffic controller to signals on Goethals - Swift to Lee.
Installed timer in signal at McKenzie and Goethals to give better performance during traffic peaks in vicinity of 703 Building.
The usual routine maintenance adjustments were performed to all signals during the month.
Changed out flasher unit at Stevens & Swift - defective telechron motor in unit.

FIRE PROTECTION SYSTEM:

Cleared ground to fire alarm circuit near 717 Building. Completed tests of auxiliary fire alarm boxes in all dormitories.
Completed scheduled maintenance to main batteries at Fire Station.
Scheduled routine maintenance and tests were performed during the month.

WATER SYSTEM:

Repaired electric range to system owned house at Horn Rapids Dam.
Disconnected and reconnected well motors at D, J & K wells as requested by Water Department.
Performed routine maintenance to domestic and irrigation pump motors.
Reconnected motor to "L" well.

SEWAGE TREATMENT AND DISPOSAL SYSTEM:

Performed routine maintenance on main plant and lift station electrical equipment.
Changed defective bearing to 60 hp recirculating motor at #2 plant.

GENERAL COMMUNITY ELECTRICAL MAINTENANCE:

Installed necessary wiring and electrical switches and outlets to meet the occupancy requirements of Community maintenance forces.
Repaired air conditioning system to W-20 Building.
Relamped outside lamps to Columbia Play Field, and replaced 20 glass bowls to lights that were broken by vandalism.
Removed service to old lawn mower shop at 722-F Hutment.
Disconnected service to two paint busses.

RICHLAND ELECTRICAL UNIT

OUTSIDE LINES AND STATIONS:

Re-arranged lines and switches at L11 & L43 junction pole at Swift and Stevens to supply Kadlec Hospital from Line 43 to comply with Dim-Out requirements.
Voltage and load checks were made to light industrial area on Stevens to alleviate low voltage at south end due to length of secondary system on original installation and recent addition of new loads and facilities. A new transformer will be added in rear of Richland Tire Shop as soon as work schedule will permit.
Service disconnects and reconnects were made to delinquent customers during the month.
Meter replacements and re-arrangements were made as follows:
Removed meter and service to tract house 1019 Lee Blvd - house to be excessed.
Replaced 46 overloaded 15 amp meters with 50 amp meters.
Replaced 25 defective Roller-Smith meters with 15 amp meters obtained from 50 amp replacements.
Installed new meter to new service to oil station at Newton & George Washington Way.
Installed new meter and service to New By Burger at Williams & Goethals.
Installed new meter and service to W D Gray Bldg and Richland Printers.
Replaced poles as follows: rotted 35' service pole rear 405 Benham. Replaced 10 rotted poles between Winslow and Wright south of Humphries.
Replaced 50' pole broken by accidental contact with contractor crane being moved past Van Giesen and George Washington Way.
Replaced new pole accidentally placed in sewer lateral rear of 326 Bossell - pole was originally set on proper clearance from Water Department, but exact location of sewer laterals is unknown and this type of incident occasionally occurs.
Transformer rearrangements were made as follows on pole line rebuilding near Fries and Wright, there was installed 250 kva of transformer capacity and 312.5 removed making a net reduction of 62.5 in this area.
A 25 kva transformer was installed at Wellsian Way and Lee to feed new service station.
Made adjustment to correct poor blade connection to 400 amp 7200 pole top switch #225 at Saint Road and George Washington Way.
Set 7 new steam line poles for 700 area landlord on Work Order.

ESCORT SERVICE:

Escort service was providen on two occasions to contractor moving heavy equipment through town. The load height made it necessary to remove and re-install signal and span at Van Giesen & Bypass. Contractor was back charged to cover expense.

UNUSUAL INCIDENT:

Broken power pole at Van Giesen & George Washington Way was caused by large crane on trailer being moved through intersection by sub-contractor for Lewis Hopkins Co. The accident caused short circuit of two important feeder lines of 7200 volts and was very near disastrous to traffic and crane operator. Extensive high voltage switching and the use of hot line tools by Electrical Unit linemen reduced the outage time and safe restoration of service. The contractor was back charged to cover the repairs to line and pole and hold over time for nine men.

1206807

RICHLAND ELECTRICAL UNIT

DELINQUENT BILLING DISCONNECTS:

Delinquent billing disconnects were made to 12 customers during the month. 11 were subsequently reconnected.

UNSCHEDULED OUTAGES:

June 15th to Line 44 caused by contractor breaking pole with crane - intersection of Van Giesen and George Washington Way.

SCHEDULED OUTAGES:

On Line 23 - vicinity of Fries and Winslow - to transfer equipment to new poles.

CALLOUTS:

Two call-outs were necessary during the month as follows:
Three men to provide an escort on Saturday, June 18th.
One man to restore service to customer disconnected for delinquent payment of bill. Persons receiving the service were billed for expense.

COMMUNITY OPERATIONS SUB-SECTION
ENGINEERING UNIT
MONTHLY REPORT
JUNE 1955

PERSONNEL:	Exempt	Non-Exempt	Total
Employees Beginning of Month	7	4	11
Transfers Out	0	0	0
Transfers In	0	0	0
Terminations	0	0	0
Total End of Month	7	4	11

BUILDING PERMITS ISSUED IN JUNE

1. John Jaquish (Johnny's Drive In Farmers Market) - 1177 Lee Boulevard - Partial building permit and plumbing permit.
2. R. J. Ascherl - 1342 Birch - Garage
3. W. E. Horrocks - 1407 Iry - Carport
4. Colin Bleiler - 1345 Lee Boulevard - Service Station
5. F. M. Purvis - 515 Winslow - Wood frame patic
6. K. J. Miller - 1330 Gillespie - Move metal quonset hut into community
7. 9 sign permits

NEW MUNICIPAL CONSTRUCTION STARTED IN JUNE

Relocation of 20" Meter at 3000-F Well
Water Meter Installation for 300 Area Supply Lines

NEW PRIVATE CONSTRUCTION STARTED IN JUNE

Johnny's Drive In Farmers Market - 1177 Lee Boulevard
R. J. Ascherl - 1342 Birch - Garage
W. E. Horrocks - 1407 Iry - Carport
Colin Bleiler - 1345 Lee Boulevard - Service Station
F. M. Purvis - 515 Winslow - Wood frame patic
K. J. Miller - 1330 Gillespie - Place concrete foundation under quonset hut

PRIVATE CONSTRUCTION COMPLETED IN JUNE, OR ON WHICH FINAL INSPECTION MADE

NONE

ENGINEERING JOBS COMPLETED IN JUNE

C-11457 - Plat and Legal Description, American Red Cross
C-97181 - Plat Drawing on Land So. of Morgan's Warehouse and Land North of Weber's Warehouse

1206009

DECLASSIFIED

UNITED STATES
ATOMIC ENERGY COMMISSION
HANFORD OPERATIONS OFFICE
P. O. BOX 550
RICHLAND, WASHINGTON

HO-116C
(8-55)
IN REPLY REFER TO:

Date: June [illegible], 1[illegible]

TO : AEC Budget Division
703 Building 700 Area

SUBJECT: NOTICE OF CHANGE IN CLASSIFICATION

Notice has been received from the General Electric Company Non-Technical Document Review Board, Hanford Atomic Products Operation, Richland, Washington covering the following change in classification effective

10-27-55.

HANFORD DOCUMENT No. 59803-Sect. W G.E. DOCUMENT No. HW-37[illegible]-W

DOCUMENT DATE June, 1955 PRESENT CLASSIFICATION W [illegible]

TITLE or SUBJECT: FINANCIAL DEPARTMENT PROCEDURES [illegible]
MONTHLY REPORT - June, 1955

AUTHOR(S) or ORIGINATOR H. Tellier

The above document has been

[XX] Declassified [ ] Downgraded to

According to our records you have copy(ies) [illegible] Series A

INSTRUCTIONS

Delete all present classification markings, which may be inconsistent with the changed classification indicated above, and re-mark in accordance with existing AEC Security Regulations.

REMARKS:
Note: This declassification action applies ONLY to Section W of the complete report and does not affect the classification of any other part of HAN-59803 (HW-37658)

This document was transmitted to you
from Hanford on
Via:

1206010

DECLASSIFIED

Lee E. Spear, Chairman,
Hanford Operations Office Non-Technical Document Review Board
Dorothy S. Kempe

STATUS OF ENGINEERING UNIT PROJECTS

G-01009 - Knight Street Improvement - Contractor's notice to proceed given 6-21-55.

G-01010 - Extension Torbett West of Perkins Avenue - Contractor's notice to proceed given 6-21-55.

G-01012 - Boise Street Extension - Contractor's notice to proceed given 6-21-55.

G-01015 - Water Service to Commercial Users (7 locations) - Construction 90% complete.

G-01016 - Water Service to Property at Lee Boulevard & Wellsian Way - Service completed.

G-01018 - Relocation of 20" Meter at 3000-F Well - Contractor's notice of award given 6-28-55.

G-02171 - Automatic Bar Screens Sewage Lift Station - Contractor has indicated construction will start about Sept. 1, 1955 when equipment is received.

G-02176 - Comfort Station, Sewage Lift Station - Chlorination Station, Riverside Park - Construction 60% complete.

G-02193 - Development Riverside Park - North of Lee Blvd. - Bids for contract opened 6-23-55.

G-02197 - Water Meter Installation for 300 Area Supply Lines - Contractor's notice of award given 6-28-55.

G-03628 - Van Giesen Street Improvements (G.W.W. to Hunt Ave.) - Contractor's notice to proceed given 6-21-55.

G-03629 - Replacement of Thin Wall Steel Water Lines (FY 1955) - Bids for contract opened 6-27-55.

STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS

I-90914 - Utility Lines, Legal Descriptions and Diagrams for Churches - 90% complete.

I-91014 - Retirement of Separate Irrigation System - Plans being reviewed by A.E.C.

I-91024 - Retirement of Irrigation Canal - Preliminary scoping complete and being reviewed by A.E.C.

C-11460 - Plat and Legal Description Christian Science Society - 75% complete.

C-11461 - Revise Legal Description of 11 Churches - 80% complete.

C-11462 - Richland Post Office (Plat and Legal Description) - 90% complete.

C-81020 - "As Builts" - Phase III - 65% complete.

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STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS (Cont.)

C-81384 - Plot Lot Lines on Utility Drawings from Plats of Richland - 15% complete. Work temporarily delayed while awaiting completion of other phases of work by others.

C-95389 - Grace Bacon Rollerena - "As Built" Plans - Plans received.

C-95450 - Replace Lot Line Corner Stakes - an open active file.

C-98001 - Extending Sewer to Vacant Lot, "Rose Garden" - Study and estimate of cost 75% complete.

BUILDINGS UNDER CONSTRUCTION

Assembly of God Church - 99% complete. No progress this month.

First Baptist Church (Richmond and Raleigh Sts.) - 92% complete. No progress this month.

Television Antennae - an open active file. No permits being issued.

Plans, Specs., Inspections, Church of Nazarene Addition - 97% complete. Work progressing slowly. Building now occupied.

Plans, Specs., Inspections, Thorsness Service Station and Drive In - SE Corner Goethals and Williams - Materially complete. Final inspection to be made.

Plans, Specs., Inspections, Christ of King Parish (Catholic) - Materially complete and partially occupied.

Addition to Uptown Thrifty Drug Store - Materially complete. Final inspection to be made.

Plans, Specs., Inspections, Uptown Thrifty Drug Store Rehabilitation - Final inspection to be made.

Plans, Specs., Inspections, Tide Water Associated Oil - 99% complete. Final inspection to be made.

Plans, Specs., Inspections, Colin Bleiler Service Station - 70% complete. Work progressing according to schedule.

Plans, Specs., Inspections, Continental Oil Company - 30% complete. Progressing according to schedule.

Plans, Specs., Inspections, Tim's Drive In - 98% complete. Open for business. Final inspection to be made.

Plans, Specs., Inspections, L. G. Cook Building - 35% complete. Work progressing slowly.

Plans, Specs., Inspections, Desert Inn Swimming Pool - 95% complete. Pipe failure from filters to the pool has necessitated additional work in replacing pipe.

Plans, Specs., Inspections, Johnny's Drive in Farmer's Market - 10% complete.

Plans, Specs., Inspections, Shell Oil Company Service Station - 85% complete. Work progressing slowly.

120612

COMMUNITY OPERATIONS SUB-SECTION
PUBLIC WORKS AND RECREATION UNIT
MONTHLY REPORT
JUNE 1955

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees Beginning of Month	7	44
Transfers Out	0	3
Transfers In	0	3
New Employees	0	10
Terminations	0	0
Total End of Month	7	54

GENERAL

Headquarters of Roads and Streets, Grounds Maintenance, Waste Removal, and Crafts Maintenance, were moved from the 700-B Area on Knight Street to the 722 Hangar within the 700 Area. A small amount of equipment and material is still at the 700-B Area and this will be transferred as soon as the necessary space is vacated by a planned move of the sub-stores now located in the 722 Hangar.

ROADS AND STREETS

The By-Pass Highway was treated with a seal-coat of oil and 1/2" rock from its intersection with Stevens Drive on the north to its intersection with the CAP road on the south, and approximately 1/2 mile of Thayer Drive from the By-Pass Highway north also received a seal-coat.

A two course light bituminous surfacing was applied on Davison Road from Saint Road to existing pavement north of Newcomber Avenue.

Catch basins were installed on both sides of Willard Avenue approximately 160' north of Swift Boulevard, and these catch basins were tied to the storm sewer on Swift Boulevard with 12" R.C. pipe. This installation was necessary to drain a low area on Willard Avenue.

Catch basins with connecting 12" R.C. pipe were installed on the northwest and southwest corners of the intersection of Thayer Drive and Longfitt Avenue to carry surface drainage through this intersection.

Shoulders in the 300 block of Roberts and Rossell, and the 400 block of Snow were re-shaped and stabilized with 3/4" minus material.

A contract was awarded for the improvement of Van Giesen Street from George Washington Way to Hunt Avenue, and construction work is scheduled to start on July 5, 1955.

Routine seasonal maintenance was continued on streets, drainage systems, and street signs.

1206813

PUBLIC WORKS AND RECREATION UNIT

SANITATION

Collections of garbage and trash were carried out according to schedule. Total weight of material collected and disposed of was 999 tons.

PARKS AND PUBLIC GROUNDS

The weed control spray program was completed for this season during the second week of June.

Responsibility for performance of maintenance of the Richland Cemetery was transferred to the Richland School District as of July 1, 1955.

The major part of the crew engaged in irrigation of lawn grass was assigned to graveyard shift on June 6, 1955.

Week-end clean-up of rest room facilities at Riverside Park was initiated on May 28 and will continue through Labor Day.

The old concrete slab at the former site of Masonic Club in north end of Riverside park has been removed and dumped north of the park area to build up this low land.

Construction of the new Comfort Station at Riverside Park is progressing and completion is scheduled for August.

A contract has been awarded for the development of Riverside Park north of Lee, and work will commence in July.

Routine maintenance of parks grounds and buildings, shelterbelts, and assigned lawn grass area was continued.

MOSQUITO CONTROL

A 16' flat bottom aluminum boat equipped with an outboard motor and gas driven spray pump was procured and placed in service spraying flooded areas along the Yakima River. This boat has allowed for spraying of areas that heretofore have been inaccessible to the truck-mounted sprayers.

A total of 940 gallons of diesel oil and 250 pounds of DDT have been used during the month. However, a large amount of mosquitoes have shown up in the south end of town and continued windy evenings have reduced the effectiveness of fogging operations in this area.

Mosquito larvae counts in the control area indicate good results in the spraying of ponds, flooded areas and other breeding grounds, and a few nights of calm air should bring results from the adulticiding work.

1206014

PUBLIC WORKS AND RECREATION UNIT

RECREATION

General

The Summer Recreation program started on Monday June 6 at both Riverside Park and Columbia playfield with one male and one female playleader on duty.

The State Jaycee Junior Tennis tournament was held at the Riverside Park tennis courts on June 10, 11 and 12.

The annual reception for the 1955 Columbia High School graduates was held at the Social Hall on Thursday June 2.

The Atomic Energy Commission government auction was held in the Community House Games Room on Monday June 20.

The first of the special events of the summer recreation program was held at Riverside Park on Wednesday June 29 with 40 participants for the Baseball Pitch contest.

The summer community band gave its first concert on Thursday evening, June 30 at Riverside Park Bandstand.

ATTENDANCE STATISTICS - June 1955

	No. of Sessions	Youth	Adults	Sub Total
A. Community House				
Atomic Energy Commission	1	73	685	758
American Red Cross	1		100	100
American Red Cross Water Safety Inst.	1		8	8
Boys of Woodcraft	1	18	4	22
Boy Scouts	5	101	91	192
Camera Club	1		15	15
Campfire Girls	1		20	20
City Council	3		108	108
Games	23	896	149	1 045
Girl Scouts	1		10	10
Hi-Spot	6	1 647	24	1 671
International Folk Dancers	3	1	27	28
Junior Sportsmen	1	10	2	12
Laundry Workers Union	2		72	72
National Little League	1		8	8
Pony and Colt League	1		15	15
Rainbow Girls	3	44	55	99
Rec-A-Teers	4		408	408

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PUBLIC WORKS AND RECREATION UNIT

Attendance Statistics - June 1955 (Cont'd.)

	No. of Sessions	Youth	Adults	Sub Total
A. Community House (Cont'd.)				
Richland Rod and Gun Club	1	27	168	195
Social Security	2		60	60
Stamp Clubs	2	10	11	21
Tri-City Herald	1	17	2	19
Umpires' Association	1		16	16
Veterans of Foreign Wars	2		57	57
Women's Bowling Association	1		25	25
Y.W.C.A. Bridge Club	2		20	20
Total Community House	72	2 844	2 198	5 042

B. Parks and Playgrounds

	No. of Sessions	Youth	Adults	Spectators	Total
Columbia Hardball Field	39	420	165	975	1 560
Triple-O-League	4		360	500	860
Play For Fun League	9	585		600	1 185
Wellsian Lake	30	1 800		350	2 150
All Playgrounds	360	10 800	500		11 300
Memorial Softball Field	22	660	1 320	2 000	3 980
Jefferson Little League	18	540	108	1 800	2 448
Scheduled Picnics	35	350	1 200		1 550
Baseball Pitch Contest	1	40	12	15	67
State Junior Tennis Tourn.	3	90	25	500	615
Practice Field Bookings	216	3 672	280		3 952
Total Parks and Playgrounds	737	18 957	3 970	6 740	29 667

C. Summary

Community House and Parks and Playgrounds total for June 1955	809	22 610	6 168	6 740	34 709
Calendar Year to Date					150 173

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COMMUNITY OPERATIONS SUB-SECTION
WATER AND SEWERAGE UTILITIES UNIT
MONTHLY REPORT
JUNE 1955

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	5	22
Transfers Out	0	0
Transfers In	0	0
New Employees	0	0
Terminations	0	0
Total End of Month	5	22

DOMESTIC WATER

Normal operations were continued throughout the month. However, it was difficult for a few days when water consumption increased considerably to maintain satisfactory water pressures on the system and at the same time, some well pumps were out of service for repairs.

On June 9 repairs were completed on 3000-K well pump. The pump was re-installed and returned to service. Also, on June 9 the 3000-D well pump was pulled for repairs. The pump turbine had burned out a turbine bearing when the water table dropped too low to supply sufficient water to the pump. On June 14 the pump turbine unit from 3000-L well and the necessary spare parts to overhaul 3000-J well were received. The turbine unit was installed in 3000-J well on June 15 and the 3000-D well pump was re-installed this same date. Repairs were completed on the 3000-J well pump turbine unit and this unit was installed in 3000-L on June 21.

Water percolation through the 3000 recharge area was retarded due to a build up of silt over the area and both sections of the area were cleaned by windrowing with a road grader during the month.

A water main leak developed in an 8" steel-dipped and wrapped water main at 2415 Richmond Street. Leaks have occurred in a short section of this water main on four previous occasions since the line was installed in 1949. Inspection of the line indicates a severe electrolysis condition in this immediate area. This condition was called to the attention of the Community Engineering Unit for study and recommendations. We are planning to replace approximately 50' of pipe in this area.

Many complaints have been received from tenants because of sand in domestic water. These complaints have been primarily from tenants in the

1206817

area of Howell, Hodges Court, Willis, and Davison Streets. This area would indicate that sand is coming through the sand trap on the 20" feeder main on George Washington Way. We have endeavored to keep the sand out of the system by flushing through fire hydrants.

Water meters were installed at the following locations during June:

Pauls Inc.	802 George Washington Way
Parkers Hardware	1334 Jadwin
3000 Area Chlorinator Service Line	3000 Area Well Field

DOMESTIC WATER DATA

	Well Production	Av. Da. Prod.	Total Consumpt.	Av. Da. Cons.
Richland	194,200,000	6,473,333	621,290,000	20,709,666
North Richland	419,584,000	13,986,133	40,145,000	1,338,166
Columbia Field	110,024,500	3,667,484		
300 Area			60,921,000	2,030,700
Total	723,808,500	24,126,950	722,356,000	24,078,532

Maximum daily production, 29,385,200 on June 21.
Maximum daily consumption, 30,770,200 on June 21.

SEWERAGE SYSTEM

Normal operations and routine maintenance were continued throughout the month.

Electrical maintenance replaced an upper bearing in No. 2 underflow pump at the Sewage Treatment Plant. Considerable difficulty was encountered in keeping chlorinators operating at No. 2 Sewage Treatment Plant. This difficulty was caused by excessive sand in the domestic water supply to the chlorinators. We are presently installing a sand trap in the supply line to overcome this difficulty.

Approximately 90,000 gallons of sludge was pumped to the drying beds during the month.

SEWAGE DATA

Plant No. 1	Total Flow	37,800,000	Average Daily Flow	1,260,000
Plant No. 2		75,012,000		2,500,400
Total		112,812,000		3,760,400

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WATER AND SEWERAGE UTILITIES UNIT

IRRIGATION SYSTEM

Normal operation and maintenance of the Irrigation System was continued throughout the month.

Two leaks in the wooden supply line to No. 1 Irrigation Station were repaired during June.

Two 1-ton drums of chlorine were applied to the main irrigation canal for aquatic weed control during the month. One of these drums was applied near the head of the canal by an experimental method and has apparently worked out quite successfully.

1206819

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
JULY 1955

ORGANIZATION AND PERSONNEL	EXEMPT	NON-EXEMPT
Employees - Beginning of Month	3	9
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
End of Month	3	9

GENERAL

Circulation

Books	17,970
Magazines	403
Pamphlets	57
Records	1,322
Inter-Library Loans	20
Grand Total	19,752

Current Book Stock

Books added this month	328
Books withdrawn this month	12
Grand Total	35,013
Phonograph records added	247
Phonograph records withdrawn	120

Registration

Adult	170
Juvenile	117
Grand Total	287
Total Registered Borrowers	19,577
Meetings in North Hall	9

The registration for the children's summer reading program, "On Safari to Africa" is 395. Of this number, 177 children have reported on one to four books, 33 have reported on five to nine books, and eleven have completed the required ten books to become winners in this year's summer reading club.

An exhibit of art work by James McGrath has been in North Hall this month. The exhibit was sponsored by the Allied Arts Association. The winning plans for the Richland Civic Center resulting from the contest between Washington State Architectural students sponsored by the Plaza Committee and the Richland City Council, have also been on exhibit.

1206820

AUXILIARY OPERATIONS AND PLANT PROTECTION SECTION

MONTHLY REPORT - JUNE 1955

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	104	103		1 (a)
Security and Patrol	476	475		1 (b)
Fire Protection	136	135		1 (c)
Office Auxiliaries	118	131	13 (d)	
Telephone	83	84	1 (e)	
TOTALS	919	930	14	3

NET INCREASE: 11

(a) - Administration Area Maintenance

1 - New Hire
2 - Terminations

(b) - Security and Patrol

2 - Transferred in
3 - Reactivated
3 - Transferred out
1 - Deactivated
2 - Terminations

(c) - Fire Protection

1 - Transferred out

(d) - Office Auxiliaries

25 - New Hires
10 - Transferred out
1 - Deactivated
1 - Termination

(e) - Telephone

1 - New Hire

1206821

FIRE PROTECTION UNIT

Fire Responses

Construction	1	Loss	$ 10.00
Outer Area	1	Loss	----
U. S. Army	2	Loss	1,642.22
Private	1	Loss	100.00
HAPO	9	Loss	190.04
TOTALS	14		$1,942.26

Drills Held During June

Outside drills held	107
Inside drills held	106

45,892 feet of fire hose and 749 feet of ladders were used for drill purposes during June.

Fire Protection Unit officers held two fire extinguisher demonstrations and Chemox mask class with 30 people of various departments in attendance.

Fire Extinguishers

Inspected	1,710
Installed	9
Tested	755
Delivered to new locations	11
Seals broken	26
Serviced	254
Weighed	830

Gas Masks

Inspected	41
Serviced	18

OFFICE AUXILIARIES SUB-SECTION

Plant Mail Unit

Interoffice, outgoing postal and incoming postal mail volume all increased during the past period. Teletype activity increased sharply and special assignments were numerous.

The special assignments consisted of: Preparation for mailing of the Employee News Letter to all employees via postal mail to all home addresses; new telephone book distribution in the outer areas; the distribution of cards for Safety Awards; the preparation and mailing of the booklet "How Hanford Looks to You"; and the routine distributions, i.e. Health Bulletins, GE Monogram, Office Letters, etc., which totaled twenty-six separate mailings, plus sixty-three Organization and Policy Guides.

Plant Mail Unit (Contin)

"Certified Mail", a new postal service, was adopted for use of mail having no intrinsic value and requiring only proof of delivery on June 7th. This new service is at a lower cost than "Registered Mail" and can be used on most of the mail now being registered, except the classified or classifiable mail, with an annual estimated savings of $600.00 based on past usage.

Addressograph work remained normal and no backlog of work exists. The new plates for the telephone billing file, started last month, are completed and a review is now in progress of the OPG file and new plates are being made where needed.

Types and Pieces of Mail Handled	May	June
Internal	4,467,528	4,879,232
Postal	91,409	92,516
Special	2,339	2,238
Registered	10,490	10,165
	4,571,766	4,984,151
Total postage used	$3,265.06	$3,335.75
Total teletypes handled	2,888	3,354
Total store orders handled	530	580

Addressograph	May		June	
	Number of Runs	Total Copies	Number of Runs	Total Copies
Plate name list	123	252,215	118	178,769
Housing list	17	45,391	18	46,231
Payroll list	9	22,102	11	20,118
Total new plates	3,211		4,860	
Total corrected plates	4,168		2,845	
	7,379		7,705	

Printing Unit

The relocation and rearrangement of work flow and equipment in Printing which was completed last month has increased work efficiency to a noticeable extent.

Among the larger orders printed during the month, was one for 562,496 copies of Form G-88-DS, "Don't Say It - Write It", and one Top Secret order of thirty-six originals for the AEC.

Time was also made available to clean up the plant printing equipment and some extra effort devoted to general housekeeping.

A representative of Eastman Kodak Inc., Seattle, spent the afternoon of June 22 with our copy camera operator, assisting the operator in techniques of halftone negative shooting with the newly installed camera lights. He also imparted to us some valuable techniques he learned at a recent information meeting in Seattle which was conducted by the Lithographic Technical Foundation, Inc.

1206623

Printing Unit (Contin)

Work Completed	May	June
Orders Received	360	364
Orders Completed	379	389
Average orders on hand	93.3	57.4
Copies Printed	1,874,915	1,450,675
Negatives masked	591	512
Negatives processed	682	470
Photo copy prepared	307	195
Litho plates processed	705	594

Stenographic Unit

Productive work totaling 2610.5 hours was performed by the Stenographic Unit against 118 stenographic orders and work is current at month's end.

Twenty-two new employees were assigned to the Unit during the month; all inexperienced stenographers and, therefore, employed as Stenographer-Typists. Ten transfers to permanent assignments were effected and twenty-eight temporary assignments were made to other units.

Work assignments sent to the Unit, as well as loan requests, were heavy throughout the month. The larger assignments included 55.5 hours work for Safety, 176 hours for Reactor-Process, 41.5 hours for Separations - T Plant, 61.5 hours Manufacturing Cost, 49.5 Plant Accounting, 94.5 hours Records and Standards, and approximately 190 hours on various collating, stapling, enveloping, labeling and enveloping material preparatory to mailing.

	May	June
Total Production Hours	1,855.5	2,610.5
Training Hours	233.5	290
Unassigned Hours	64	175.5
Holiday Hours	0	64
Meeting Hours	7	4
	2,160.0	3,144.0

Duplicating Unit

Discussions held with Stores and AEC Procurement Personnel resulted in an agreement which will permit the purchase of an improved quality #4 Sulphite Bond for Duplicating use. This paper is specifically processed to be run through lithographic presses, is packaged in moisture proofed wrappers to reduce wrinkling tendencies, is of consistent size and whiteness between reams, and has more body or substance making it ideally suited to two-side printing. It is expected that the small additional cost of this paper will be compensated for through labor savings and reduction of material waste.

1206824

Duplicating Unit (Contin)

	May	June
Orders received	3,404	3,600
Orders completed	3,416	3,707
Orders on hand	263	157
Offset plates	17,110	17,610
Offset copies	1,106,567	1,128,898
Verifax masters	2,625	2,436
Verifax Copies	8,659	6,991
Ditto masters	415	318
Ditto copies	8,356	6,282
Zerox plates	1,693	2,202
Ozalid masters	39	6
Ozalid copies	233	67
Embossograph orders	17	7
Embossograph copies	104	91
Number of copies duplicated	1,123,919	1,142,329

Office Equipment Unit

Office Furniture

The expendable office furniture inventory account 93 was valued at $11,288.00 on May 31, or an average of 2.1 months supply on hand. Withdrawals for the month was $4,026.00 with $3,678.00 received into the account.

The bulk of material transferred from construction contractor to the account has been at a no value cost which has reduced the dollar value of the inventory account to a low level whereas the quantity of material physically on hand has increased. The program of transferring material from construction contractors to Operations is nearly completed.

The following is a detail of number of pieces of furniture handled during the month:

Item	Issued	Received	Salvage
Blackboard	18	2	0
Bookcase	12	3	0
Cabinets	56	115	18
Card File	5	19	0
Costumer	13	22	3
Chair	123	104	42
Desk	38	47	9
Table	22	36	3
Miscellaneous	140	180	4
TOTALS	427	528	79

A total of 119 service orders were issued to cover the cost of minor repairs of office furniture and locks.

There was a total of 602 debit and credit store orders processed during the month or an average of 28 orders per day.

Purchase requisitions have been issued to cover office equipment requested on Appropriation Request 55-EX-11. Purchase orders will be placed on these requisitions prior to FY-55 year end date.

1206025

Office Machines

The total number of machines in service and stock as of the 20th of June was 4,445 or a net reduction of 137 over previous month. One hundred and forty-one machines were excessed and four new machines were added.

The number of machines assigned to construction contractors was 313 on the 20th of June. A reduction of 151 machines from the previous month.

The construction contractors will reduce their office machine inventories to approximately 75 machines by July 1. The remaining machines will be turned in over the next 60 days.

There has been a total reduction of 780 office machines since July 20, 1954, which includes construction and operations inventories.

An annual inventory and utilization survey of office machines was made during the month of June. Complete details of the results of this inventory has not been completed as of this date.

Office Machine Repair Unit

In preparation for closing up the 3000 Area Office Machine Repair Shop by July 11, equipment is being removed and relocated in the 700 Area and the 100-H shops.

All attendance time recorders were transferred to the new telephone exchange on June 17th; all equipment was then checked out for satisfactory operations.

Two time attendance recorders were installed during the month, one in the W-21 Building, the other in the W-17 Building to accommodate personnel transferring from 3000 Area.

A six-months routine check and inspection of all hospital scales was completed during the month.

Repair tickets processed were as follows:	May	June
	481	458

ADMINISTRATION AREA MAINTENANCE SUB-SECTION

Following completion of renovation work on dormitory buildings W-17 and W-21, North Richland personnel was moved to these and to other 700-1100 area buildings.

Relocation of Community Public Works personnel to the 722 Building has been completed. When remainder of materials have been removed from Knight Street hutments, these buildings will be made available for sale and removal.

Nine office moves were made in June.

Five Hauserman office partition installations were made in 700 Area, one in 200 Area and one in 100 Area. Two Hauserman installations were removed from 700 Area.

Purchase requisition for Hauserman partition, chargeable against FY 1955 budgeted funds, was returned unapproved by the Commission, who specified that such purchases must be submitted for competitive bids. Specifications are being prepared and a new requisition will be issued, against FY 1956 budgeted funds, which will result in some installation delays because of stock shortage.

1 206826

Administration Area Maintenance (Contin)

Information informally received from AEC indicates that they are continuing to pursue the possibility of a new office building, either under lease-purchase plan or through budgeted funds.

Exterior repainting of 770 Building groups, W-10, W-17 and W-21, was completed by Real Estate Maintenance, on orders from this Sub-Section.

Arrangements were made to transfer landlordship responsibility for dormitories W-17 and W-21 from Community Section to this Sub-Section.

Arrangements were also made to transfer landlordship for the 722 Hangar Building to Community Section, inasmuch as they are now the sole occupants of this structure.

General Maintenance

Accoustical tile was installed on ceilings of eight rooms in 703 Building and on ceiling and walls of one room in the hospital.

Forty-two lineal feet of movable office partitioning were relocated, and 32 additional lineal feet were installed. Filler to ceiling was installed over 38 feet of this partition.

Remodeling of 722-P Hutment, for occupancy by AEC Security will be completed early in July. Equipment connections are being provided, and 28 feet of sheetrock wall is being installed to enclose darkrooms.

Remodeling work on dormitories W-17 and W-21 was completed. Electric hot water tanks were installed, incandescent lights were replaced with approximately 240 used fluorescent fixtures, and 180 receptacles were installed. Radiator valves were replaced, sash balances were installed on 20 windows, minor carpentry repairs were made, and necessary interior repainting was done.

Routine minor carpentry jobs were normal for the month.

One-hundred crosswalks were striped for Community during June, and approximately 25 street stencils were painted.

Miscellaneous small signs were fabricated for Transportation and Patrol; 60 "No Parking" signs were "Scotch-lited" for Community, and 25 for outer area roads.

The 713 Building P.R.V. Station was relocated outside the structure to correct heat and noise factors in office area.

Work is progressing on relocating the steam line servicing the IBM refrigeration equipment along outside edge of 713 Building roof, to reduce building heat during summer months.

The air conditioning system in the OB Section of the hospital was revised to provide more adequate distribution of cooling. Sediment was removed from inside of Buffalo cooling units and duct work serving OB and surgical wards and equipment was repainted.

Twenty-eight tubes were replaced in connection with overhaul work on No. 4 Boiler at 784 Power House.

1206021

General Maintenance (Contin)

The welding shop was relocated in the 716 Building.

An exhaust system was fabricated for the paint spray booth in the 716 Building.

One section of heat exchanger tubes in 1171 Building furnace was removed for inspection and repair.

Electric circuits and receptacles were installed to serve food carts and blood bank storage in the hospital.

Locksmith work and miscellaneous electrical work were heavy during the month, and included numerous on-the-spot calls for repair work.

Building Services

Clean up and sealing of tile floors in 1171 Building was completed.

Special clean-up, including washing of all windows, was performed in W-17 and W-21, to prepare for new occupancy.

Window washing in 760 Building is 90% complete.

Special attention was given to general dusting and restroom sanitation during the month.

Steam Operation

Nos. 1 and 2 boilers were in service at the beginning of the month, with No. 3 in reserve and No. 4 undergoing biennial major overhaul.

Decreasing heating load permitted No. 1 unit to be withdrawn from service on June 3. After several minor repairs were performed this boiler reverted to reserve status.

At the close of the month, No. 2 boiler was in service, with Nos. 1 and 3 in reserve, and No. 4 undergoing major overhaul.

The quantity of steam generated at 784 Plant was 22.6% less than for the same period of the previous year.

Following the turn-offs of heating steam at the various buildings by maintenance forces, the building service lines were shut off at the main line to reduce line loss as much as possible.

Boiler at Central Stores heating plant was shut off for the summer on May 31, after fuel supply was exhausted. Plans are being formulated to clean the 12,000 gallon fuel oil storage tank to eliminate the problem of plugged oil supply lines experienced in the post-heating season.

1206828

Steam Operation (Contin)

Coal consumed:	641.50 net tons
Steam generated	9,289.0 M. lbs.
Steam leaving plant	8,020.2 M. lbs.
Steam delivered	5,860.2 M. lbs.
Total water softened	1,558,600 gallons
Total soft water sent to Kadlec Hospital	154,720 gallons
Total soft water sent to 784 heating plant	1,254,480 gallons

TELEPHONE SUB-SECTION

On June 17, the new 700 Area plant exchange, provided by Project CA-533, and the new 100KBC dial exchange, provided by Project CA-512, were placed in service. At the same time, the North Richland exchange was isolated from the plant telephone system to become solely a part of the Community telephone system. Placement of the 100KBC dial exchange in service made the 300-line construction manual switchboard in the 100K area available for removal, as all lines formerly served by the manual switchboard were transferred to the dial exchange. The 100KBC dial exchange had been partially placed in service on May 26 to serve the telephone requirements of the 100B and C areas, thus relieving the old 100B area dial exchange of all connected lines and making it available for removal. Some items of equipment from the old 100-B exchange were required to be transferred to the new 100KBC exchange to complete it for its full 300-line capacity.

Service to all business and residential class telephones connected to the North Richland exchange was discontinued during the month and ownership of the North Richland distribution cable facilities was transferred from the AEC to the U.S. Army on June 30. The North Richland exchange itself, however, is being retained by the AEC for an indefinite period to serve pay stations in North Richland, approximately 85 residential telephone subscribers in Richland who are temporarily connected to the North Richland exchange and several official telephones. Trunks from the Army telephone system still terminate in the North Richland exchange, but will be re-terminated in the Richland Community exchange in August, 1955. The transfer of North Richland telephone property from the AEC to the Army included approximately 250 telephone instruments.

The total number of telephone subscribers (of all classes) in service at June 20 was down 160 from the previous month, and down 674 as compared with a year ago. The loss of telephone subscribers is largely due to completion of the 100K area and Purex construction programs and the transfer of North Richland to the Army. Three-hundred and forty-three of the 674 subscribers lost during the past year were official and 331 were residential. There was no change in the number of business subscribers.

A switchboard operator training program begun in May was completed June 11.

New Plant telephone directories were distributed to official telephone users on June 17 and 18.

1206829

Plant Telephone Operations

During the month, all personnel not required for essential maintenance were assigned to perform work preparatory to placing the new 700 Area and 100K area Plant exchanges in service and to perform necessary follow-up work after the exchanges were placed in service. The major jobs performed in connection with getting the two new exchanges in service and isolating the North Richland exchange from the plant system were as follows:

1. Making acceptance tests on the new exchange equipment and working with the equipment suppliers to rectify wiring errors and omissions.

2. Transferring approximately 760 official subscriber lines from the Richland Community exchange to the new exchange.

3. Transferring approximately 85 official subscriber lines from the North Richland exchange to the new 700 Area exchange.

4. Disconnecting 102 inter-area trunks from the Richland exchange and establishing 114 inter-area trunks to the new 700 Area exchange.

5. Moving 12 foreign exchange trunk terminations from the Richland Community exchange to the new exchange and establishing 14 direct trunks from the 700 area exchange to the Pasco and Kennewick long distance switchboards.

6. Transferring 40 special-use circuits from the Richland exchange to the 700 area exchange.

7. Making circuit and cable transfers in the Richland-North Richland tie-cable to enable transfer of a number of official subscriber lines from the North Richland exchange to the new 700 area exchange.

8. Installation of approximately 55 telephones in buildings W-17, W-20 and W-21 for personnel who were relocated from North Richland.

9. Changing number cards on all telephones affected by the transfer of subscriber lines from the North Richland and Richland Community exchanges to the new 700 Area exchange.

10. Changing 44 2-party subscribers to 1-party service.

11. Rewiring several first and second selector levels at the BY tandem office to route outgoing calls to Richland via the sixth level in place of the ninth level.

12. Establishment of 12 additional trunks from the BY exchange to the new 100KBC exchange to provide a total of 24 such trunks.

13. Rewiring selectors in the 200EW exchange to provide digit "6" selection of direct trunks to the 700 area exchange.

14. Transferring subscriber lines working in the 100K area from the construction manual switchboard to the new dial exchange and changing number cards on all 100K area telephones.

1206830

Commercial Telephone Operations

Performed several special jobs in the Richland Community exchange necessary in connection with the transfer of plant official lines to the new 700 area exchange.

Converted all common battery type residential telephones, installed at various times for medical reasons, to dial operation on June 17.

Traffic readings were taken in the Richland exchange for one week prior to June 17 and for one week subsequent to June 17 to obtain a comparison of traffic handled before and after the transfer of plant official lines to the new 700 area exchange. Collected information has not yet been analyzed.

Installed a 101-pair branch cable to serve the W-17 and W-21 buildings recently converted to office use.

Rearranged cable terminal pair count in the vicinity of Goethals and Gillespie to provide needed cable circuits.

Located and repaired two sheath defects in Richland cables, Numbers 6 and 2.

Installed a 1-A key system for Campbell's Incorporated in their new offices in the Gray building on the Parkway.

Engineering eight jobs for minor outside plant expansion and improvement.

Radio System Operations

Installed portable public address equipment in No. 2 Mess Hall at North Richland for the Army on June 3 and removed the equipment on June 6.

Installed two additional stations on existing intercommunicating systems in the 717-A building on June 14; one station for the Photo Unit and one for the Graphics Unit.

Installed and operated portable public address and tape recording equipment in the Community House on June 20 in connection with an AEC Property Auction.

Installed portable public address equipment in the W-10 Building Conference Room on June 23 to serve the Technical Training Program and removed the equipment on June 30.

Installed an audio amplifier and loud speaker in the basement of the 703 Building for the use of the Patrol Emergency Officer on duty.

Installed one additional station for the IBM intercommunicating system in the 713 Building.

Moved an intercommunicating master station in the 705 Building from Room 117 to Room 127.

Recorded Science Forum programs on June 1, 8, 22 and 29.

Field-serviced 81 mobile transmitter-receiver sets, 10 fixed station transmitter-receivers, two intercommunication systems and one radio remote control unit.

1206831

Radio System Operations (Contin)

Shop serviced 38 mobile receivers, 37 mobile transmitters, three fixed-station transmitters, three fixed-station receivers, two pack-type transmitter-receiver sets, two tape recording units, two movie projectors and two radio receivers.

Installed three and removed eight mobile-type transmitter-receiver sets.

Radio Station KKE624, No. 13 (Army Post No. 210) was out of service on June 7 from 12:30 AM to 8:50 AM due to line voltage trouble.

Radio Station KGB513 (Richland Fire Station) was out of service on June 15 from 4:15 PM to 5:20 PM due to control line trouble.

Statistical Data

	At 20th of June	Change From Previous Month	Change From Year Ago
Residential Subscribers	5757	-125	-322
Business Subscribers	469	- 12	- 18
Paystation Telephones	66	+ 2	- 2
Official Subscribers:			
Richland Exchange	244	-732	-757
700 Area Exchange	851	+851	+851
North Richland Exchange	42	-137	-225
Process Areas Exchanges	1609	- 5	-201
		-158	-674

New Service Requests Received During the Month:

For Residential Service	81
For Business Service	7
TOTAL	88

Backlog of Service Requests:

For new residential telephones	243
For new business telephones	1
For residential outside moves	41
For business outside moves	0
TOTAL	285

Service Orders Processed:

In connection with business and residential service	359
In connection with plant service	256
TOTAL	615

1206832

Telephone Facilities - Installed, In Service and Available:

	Exchange Lines			Party Lines
	Installed	In Service	Available	Available
Richland Community	4006	3326	680	452
700-1100 Areas	1230	807	423	
North Richland	600	134	466	48
Process Areas	1950	1602	348	
	7786	5869	1917	500

Radio Stations - In Service:

	At 20th of June	Change From Previous Month	Change From Year Ago
Fixed Stations	34	0	+16
Mobile Stations	156	0	+13
	190	0	+29

SECURITY AND PATROL SUB-SECTION

Document Report

Number of classified documents and prints unaccounted for as of June 1: 325
(104 of the above 325 documents are chargeable to du Pont Company)

Number of classified documents and prints reported as unaccounted for during June: 1

Number of classified documents and prints either recovered or downgraded in classification during June: 2

Number of classified documents and prints remaining unaccounted for as of July 1, 1955: 324
(104 of the above 324 documents are chargeable to du Pont Company)

The Non-Technical Document Review Board held two meetings during the month and reviewed a total of 88 documents. Of this number

14 had their classification retained,
1 was downgraded to "Confidential-Undocumented",
37 were downgraded to "Official Use Only",
30 were declassified, and
6 were not within the scope of the Board.

1206833

Security Education

Four security items appeared in the GE NEWS during the month.

There were 329 security meetings held and attended by 4,159 members of HAPO personnel. A representative of the Plant Protection Services Unit showed one of the security films at some of these meetings as indicated below:

Film Title	No. of Meetings	Av. Attend.per Meeting	Total
Badge of Honor	17	24	408
Turn Left Across the Bridge	1	32	32
The Tallest Shadow	1	40	40
On Guard	1	9	9

Two sets of the "Burma Shave" type signs were changed during June, and the new slogans are:

Use	Don't Know
Your Head	Can't Say
To Guide	Do Know
Your Tongue -	Don't Say -
SECURITY	SECURITY

Six hundred and fifty copies of the poster bearing the slogan "Check All Packages - Prevent Sabotage" were posted in all the plant areas during June.

Two hundred and fifty copies of the poster resembling a telegram with a message concerning the recognition of a package were posted in the plant areas.

GE Security Bulletin No. 94, entitled "Badges", dated May 27, 1955, was distributed during this reporting period.

Effective June 1, 1955, a chart was compiled showing the number of open file violations and violations concerning the improper storage of classified material, by month, on a comparative basis for the years 1954 and 1955 to date, in order to encourage improved security performance by employees. This chart will be made up each month and forwarded to our Department and Section Managers.

Also, a chart was compiled showing the total number of unaccounted for classified documents to date, by month, on a comparative basis for the years 1954 and 1955. This chart will be forwarded to Department Managers each month.

During the month, two additional aids to improved security performance were made available as store stock items. One is a 9" x 12" manila file folder with a red border and marked "Classified Papers". The other is a large double envelope with a red colored border especially suitable for handling multilith masters.

One hundred and one employees of the General Electric Company received a "Q" security orientation talk from either a representative of the Plant Protection Services Unit or a Patrol Supervisor, and 35 employees received the "L" security orientation lecture during the month.

Statistical Report of Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-E	200-W	300
Pat Searches	99	66	66	102	99	0	0	4
Escorts	15	23	9	54	62	4	25	22
Ambulance runs	0	4	1	1	2	0	6	7
Passes issued:								
One day temporary	29	9	25	16	10	15	35	53
Travel	0	0	0	0	0	0	0	133
Red Tag	81	54	58	28	31	111	393	102
Telephonic	0	0	0	0	0	0	0	1
Supervisors'Post Contacts	449	182	198	128	383	410	505	413
Other Patrol Activities (computed by hours):								300 & 700
File Check	189	190.5	241.2	473	373	308	308	2,516
Building Check	335	158.3	329	1,183	373	308	308	816

Arrest Report

Violations	Number of Violations	Cont. Cases from May	Cases Cleared	Pending	Fined
Failure to observe stop sign	1	0	1	0	1
Illegal Parking	3	2	3	2	3
No Driver's License	1	1	1	1	1
Speeding	1	1	1	1	1
TOTALS	6	4	6	4	6

Citation Tickets issued: 6
Warning Tickets issued: 4

Patrol Training Activities

397 Patrolmen received classroom instruction during the month.
209 Patrolmen attended firearms training during the same period.

Patrol Post Changes

Effective June 10, 1955, the 202-S Construction Badge House post, 200-W Area, was discontinued.

General

On June 9, 1955, the maximum speed limit on plant roads was increased from fifty miles per hour to sixty to conform with the county ordinance.

1,091 audits and inspections of General Electric employees, who are custodians of classified documents and prints, have been conducted since September 1, 1954, through June 30, 1955.

Security Administration

Daily Badge Log Entries	2,099
"Q" Clearances	101
"L" Clearances	35
Formal "P" clearance issued	73
"P" Approval clearances issued	64
Category access granted	41
Category access withdrawn	83
Category access revised	54
Number of photos for "A" badges	623
Number of photos for "B" badges	2,885
Number of persons rephotographed	27
Photo passes laminated and issued	616

"A" badges assembled and distributed to areas:	751
"A" badges received from the areas:	422
"A" badges received from the areas for repair:	146

Top Secret Clearances

Clearances for 28 employees were cancelled.
47 clearances were granted by the Commission.
63 clearances were requested for General Electric employees.

1206636

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HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING JUNE 30, 1955

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT							
I. Visits to other Installations							
G. D. Barr to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Participate in Personnel Conference with research and development contractor personnel of the AEC	J. V. Young	6-27-55	6-28-55	X		
E. S. Staples to: National Reactor Testing Station Phillips Petroleum Company Idaho Falls, Idaho	Conference on plant telephone operations and cost of telephone service	J. D. McPherson P. Fritsh	6-13-55	6-16-55		X	
ENGINEERING DEPARTMENT - ADVANCE ENGINEERING SECTION							
I. Visits to other Installations							
W. K. Woods to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspection of facilities and program discussion	R. L. Doan	6-22-55	6-22-55	X		
W. K. Woods to: Aircraft Nuclear Propulsion Idaho Falls, Idaho	Inspection of facilities and program discussion	W. H. Perry	6-23-55	6-23-55	X		
W. K. Woods to: Submarine Test Reactor Idaho Falls, Idaho	Inspection of facilities and program discussion	J. A. Barker	6-23-55	6-23-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - ENGINEERING ADMINISTRATION SECTION							
L. B. Mackey Research Laboratory Schenectady, New York	Consultation on Hanford assistance program	R. J. Schier	6-1-55	6-2-55	X		100-K 105-KE 202-A 200-E XXX 300-L 303; 700
W. G. Machell Atomic Power Equipment Dept. General Electric Company Schenectady, New York	Discuss fuel element development and irradiations in connection with G.E. Test Reactor	A. B. Greninger R. J. Schier	6-23-55	6-23-55	X		100-B 105-C 100-K 105-KE 300-L XXX
U. M. Staebler U. S. Atomic Energy Comm. Washington, D. C.	Recruit personnel and discuss reactor development program	A. B. Greninger	6-16-55	6-21-55	X		100-K 105-KE, KW 300-L 303 700
E. J. Werlich U. S. Atomic Energy Comm. Chicago, Illinois	Discuss patent matters	M. K. Cain	6-19-55	6-24-55	X		300-L XXX 700
II. Visits to other Installations							
D. W. Gaylor to: U. S. Atomic Energy Comm. Washington, D. C.	Attend annual meeting of Accountability representatives	Accountability personnel and AEC personnel	6-17-55	6-22-55	X		
A. B. Greninger to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspection of facilities and program discussion	R. L. Doan	6-22-55	6-22-55	X		
A. B. Greninger to: Aircraft Nuclear Propulsion Idaho Falls, Idaho	Inspection of facilities and program discussion	W. H. Perry	6-23-55	6-23-55	X		
A. B. Greninger to: Submarine Test Reactor Idaho Falls, Idaho	Inspection of facilities and program discussion	J. A. Barker	6-23-55	6-23-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. A. Merrill to: U. S. Atomic Energy Comm. Washington, D. C.	Attend annual meeting of Accountability representatives	Accountability personnel and AEC personnel	6-17-55	6-22-55	X		
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visits to other Installations							
H. S. Davis to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Obtain barite and discuss operational and design experience with shielding structures built with barite and magnetite	J. H. Krema	6-9-55	6-14-55	X		
H. S. Davis to: Aircraft Nuclear Propulsion Idaho Falls, Idaho	Obtain barite and discuss operational and design experience with shielding structures built with barite and magnetite	R. W. Coyle	6-9-55	6-14-55	X		
H. S. Davis to: Material Test Reactor Idaho Falls, Idaho	Obtain barite and discuss operational and design experience with shielding structures built with barite and magnetite	W. B. Lewis	6-9-55	6-14-55	X		
II. Visitors to this Works							
W. M. Campbell Atomic Energy of Canada Chalk River, Ontario, Canada	Waste storage consultation	W. M. Harty C. A. Rohrmann	6-13-55	6-15-55	X		
L. G. Cook Atomic Energy of Canada Chalk River, Ontario, Canada	Waste storage consultation	W. M. Harty C. A. Rohrmann	6-13-55	6-15-55	X		
E. J. Evans Atomic Energy of Canada Chalk River, Ontario, Canada	Waste storage consultation	W. M. Harty C. A. Rohrmann	6-13-55	6-15-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class	Restricted Data Unclass.	Areas
J. A. Morrison Atomic Energy of Canada Chalk River, Ontario, Canada	Waste storage consultation	W. M. Harty C. A. Rohrmann	6-13-55	6-15-55	X		
R. J. Sage Atomic Energy of Canada Chalk River, Ontario, Canada	Waste storage consultation	W. M. Harty C. A. Rohrmann	6-13-55	6-15-55	X		
C. L. Edwards E. I. du Pont de Nemours & Co. Wilmington, Delaware	Investigate wobble meter design	E. S. Day, Jr.	6-7-55	6-9-55	X		202-A 200-W Redox 300-L 303; 700

ENGINEERING DEPARTMENT - PILE TECHNOLOGY AND SEPARATIONS TECHNOLOGY SECTIONS

I. Visitors to this Works

W. F. Arnold University of California Berkeley, California	Discuss fabrication techniques of plutonium	J. J. Cadwell	6-9-55	6-10-55	X		100-K 105-KW 200-W 234, 235 300-L XXX
B. W. Dunnington E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
T. C. Evans E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches E. W. O'Rourke	6-1-55	6-3-55	X		300-L 303 700
D. S. Fairgrieve U. S. Atomic Energy Comm. Pittsburgh, Pennsylvania	Discuss zirconium specifications and fabrication	W. P. Wallace	6-13-55	6-14-55	X		100-K 105-KE, KW 300-L XXX 200-W XXX
J. A. Fellows Mallinckrodt Chemical Works St. Louis, Missouri	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
J. A. Fellows Mallinckrodt Chemical Works St. Lo 's, Missouri	Attend metallurgy development advisory committee meeting and metallurgical conference	J. J. Cadwell	6-22-55	6-24-55	X		300-L 303

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. P. Frankel (consultant) Northwestern University Evanston, Illinois	Consultation on thermal stress, stress analysis and radiation damage in plant fuel elements	V. R. Cooper	6-13-55	6-17-55	X		100-B 105-B,105-C 300-L 303 700
J. C. Graham, Jr. Mallinckrodt Chemical Works St. Louis, Missouri	Attend metallurgy advisory committee meeting and metallurgical conference	J. J. Cadwell	6-22-55	6-24-44	X		300-L 303
A. E. Guay National Lead Company Fernald, Ohio	Attend Metal Quality Working Committee meeting	R. W. Benoliel W. T. Kattner J. W. Riches V. R. Cooper	5-31-55	6-3-55	X		300-L 303 700 100-B 105-B,105-C
M. E. Harris University of California Berkeley, California	Discuss fabrication techniques of plutonium	J. J. Cadwell	6-9-55	6-10-55	X		100-K 105-KW 200-W 234, 235 300-L XXX
R. T. Huntoon E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georiga	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
S. Isserow Nuclear Metals, Inc. Cambridge, Massachusetts	Discuss uranium alloys and process	S. H. Bush	6-30-55	6-30-55	X		100-K 105-KW 300-L 303
J. R. Keeler Battelle Memorial Institute Columbus, Ohio	Attend Metal Quality Working Committee meeting and discuss work and programs at Hanford	W. T. Kattner J. W. Riches V. R. Cooper	6-1-55	6-3-55	X		300-L 303 700
W. M. Leaders Mallinckrodt Chemical Works St. Louis, Missouri	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
J. G. Lewis Dow Chemical Company University of Michigan Ann Arbor, Michigan	Discuss treatment of waste fission products from Redox and Purex plants	R. E. Burns	6-22-55	6-24-55	X		200-W 222-S

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
R. B. Long U. S. Atomic Energy Comm. Pittsburgh, Pennsylvania	Discuss zirconium specifications and fabrication	W. P. Wallace	6-13-55	6-14-55	X		100-K 105-KE, KW 300-L 303 200-W XXX
J. A. Morrison Atomic Energy of Canada Chalk River, Ontario, Canada	Discuss waste treatment problems	E. R. Irish R. J. Sloat F. W. Woodfield	6-13-55	6-14-55	X		200-W 271-U 202-A 300-L XXX; 700
T. R. Neville Knolls Atomic Power Lab. Schenectady, New York	Discussions on KAPL-120 loop	G. E. Wade	6-16-55	6-20-55	X		100-H 105 100-K XXX 300-L XXX; 700
H. R. Osterwald U. S. Atomic Energy Comm. St. Louis, Missouri	Attend metallurgy development advisory committee meeting	J. J. Cadwell	6-22-55	6-23-55	X		300-L 303
C. E. Pactschke E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
C. E. Polson National Lead Company Fernald, Ohio	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700
B. Rising University of California Berkeley, California	Discuss fabrication techniques of plutonium	J. J. Cadwell	6-9-55	6-10-55	X		100-K 105-KW 200-W 234, 235 300-L XXX
M. J. Ryan University of California Berkeley, California	Discuss fabrication techniques of plutonium	J. J. Cadwell	6-9-55	6-10-55	X		100-K 105-KW 200-W 234, 235 300-L XXX
R. J. Sage Atomic Energy of Canada Chalk River, Ontario, Canada	Discuss waste treatment problems	E. R. Irish R. J. Sloat F. W. Woodfield	6-13-55	6-14-55	X		200-W 271-U 202-A 300-L XXX; 700
H. A. Saller Battelle Memorial Institute Columbus, Ohio	Attend Metal Quality Working Committee meeting	W. T. Kattner J. W. Riches	6-1-55	6-3-55	X		300-L 303 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
D. H. Steward, Jr. Dow Chemical Company University of Michigan Ann Arbor, Michigan	Discuss treatment of waste fission products from Redox and Purex plants	R. E. Burns	6-22-55	6-24-55	X		200-W 222-S
H. E. Thayer Mallinckrodt Chemical Works St. Louis, Missouri	Attend metallurgy development advisory committee meeting and metallurgical conference	J. J. Cadwell	6-22-55	6-24-55	X		300-L 303
G. C. Westfall Knolls Atomic Power Lab. Schenectady, New York	Discussions on KAPL-120 loop	G. E. Wade	6-22-55	6-23-55	X		100-D XXX 100-H 105 100-K XXX; 700
D. M. Wilsey All States Employee Schenectady, New York	Regarding KAPL-120 in-pile loop modification	J. A. Berberet	5-1-55	8-1-55	X		100-B 105-B,105-C 100-D XXX 100-H 105 100-F XXX 100-K 105-KW 300-L 303
J. C. Woodhouse E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend metallurgy development advisory committee meeting	O. H. Greager J. J. Cadwell	6-20-55	6-24-55	X		100-B 105-C 300-L 303 700
W. M. Campbell Atomic Energy of Canada Chalk River, Ontario, Canada	Discuss waste treatment problems	E. R. Irish R. J. Sloat F. W. Woodfield	6-13-55	6-14-55	X		200-W 271-U 202-A 300-L XXX; 700
L. G. Cook Atomic Energy of Canada Chalk River, Ontario, Canada	Discuss waste treatment problems and irradiation effects to graphite	E. R. Irish R. J. Sloat F. W. Woodfield L. P. Bupp M. Lewis D. H. Curtiss	6-13-55	6-14-55	X		200-W 271-U 202-A 300-L 303; 700
E. J. Evans Atomic Energy of Canada Chalk River, Ontario, Canada	Discuss waste treatement problems	E. R. Irish R. J. Sloat F. W. Woodfield	6-13-55	6-14-55	X		200-W 271-U 202-A 300-L XXX; 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
M. H. Wahl E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend metallurgy development advisory committee meeting	O. H. Greager J. J. Cadwell	6-21-55	6-23-55	X	300-L XXX 700	
II. Visits to other Installations							
R. J. Anicetti to: Norton Company Special Products Department Worcester, Massachusetts	Discuss magnesia refractories and specifications	D. E. Webster C. H. Gustafson, Jr.	6-30-55	7-1-55	X		
S. H. Bush to: Bureau of Mines Albany, Oregon	Discuss zirconium fabrication and present status of thorium fabrication	H. Kato A. H. Roberson	6-22-55	6-23-55	X		
E. A. Eschbach to: Knolls Atomic Power Lab. Schenectady, New York	Fuel element technology	C. Weber	6-16-55	6-17-55	X		
E. A. Eschbach to: Superior Tube Company Norristown, Pennsylvania	Fabrication of zircaloy process tubes	H. W. Cooper	6-20-55	6-22-55	X		
E. A. Eschbach to: Brdigeport Brass Co. Brdigeport, Connecticut	Fabrication of zircaloy and extrusion of uranium	R. M. Treco	6-21-55	6-23-55	X		
E. A. Eschbach to: Sylvania Electric Products Hicksville, New York	Discuss canning technology	S. Roboff	6-22-55	6-24-55	X		
E. A. Eschbach to: Sylvania Electric Products Bayside, New York	Discuss fabrication of uranium components	H. Huesner	6-22-55	6-24-55	X		
H. R. Gardner to: Battelle Memorial Inst. Columbus, Ohio	Metallography Sub-Committeee Meeting	H. A. Saller	6-27-55	6-29-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
O. H. Greager to: U. S. Atomic Energy Comm. Division of Production Washington, D. C.	Attend meeting of the ACRS on KW incident	E. Bloch	6-30-55	7-1-55	X		
H. T. Hahn to: Knolls Atomic Power Lab. Schenectady, New York	Discuss mass spectrographic analysis and fluoride stability	D. H. Ahmann	6-20-55	6-21-55	X		
L. A. Hartcorn to: Battelle Memorial Inst. Columbus, Ohio	Attend Metallographic Sub-committee meeting	H. A. Saller	6-27-55	6-29-55	X		
L. A. Hartcorn to: Knolls Atomic Power Lab. Schenectady, New York	Discuss metallographic techniques pertinent to HAPO	C. E. Lacy	6-31-55	6-31-55	X		
R. E. Heineman to: Knolls Atomic Power Lab. Schenectady, New York	Discuss temperature coefficients	J. B. Sampson	6-8-55	6-10-55	X		
D. E. Johnson to: Bridgeport Brass Co. Adrian, Michigan	Witness zirconium extrusion	R. M. Treco	6-29-55	7-1-55	X		
E. M. Kinderman to: Knolls Atomic Power Lab. Schenectady, New York	"Bluenose" discussion	B. F. Rider	6-6-55	6-8-55	X		
M. Lewis to: Battelle Memorial Inst. Columbus, Ohio	Technical discussion on graphite development work	L. D. Loch	6-7-55	6-8-55	X		
L. J. Lucas to: Fairchild Engine Div. Mineola, New York	Inspect machine tool equipment	M. E. Briegs(AEC)	6-13-55	6-14-55	X		
L. J. Lucas to: Carrier Corporation Syracuse, New York	Inspect machine tool equipment	E. J. Wojner	6-14-55	6-16-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
W. J. Ozeroff to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss critical mass problems in metallurgical fabrication	H. C. Paxton R. D. Baker	6-22-55	6-23-55	X		
W. J. Ozeroff to: University of California Radiation Laboratory Livermore, California	Discuss critical mass problems in metallurgical fabrication	J. Carothers A. Kirschbaum	6-16-55	6-17-55	X		
W. A. Snyder to: Battelle Memorial Inst. Columbus, Ohio	Technical discussion on graphite development work	L. D. Loch	6-7-55	6-8-55	X		
G. W. Stuart, Jr. to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor theory	J. B. Sampson H. Hurwitz	6-27-55	6-29-55	X		
G. W. Stuart, Jr. to: Brookhaven National Lab. Upton, Long Island, New York	Discuss reactor theory	I. Kaplan	6-30-55	7-1-55	X		
W. B. Tolley to: Mallinckrodt Chemical Wks. St. Louis, Missouri	Discuss uranium reduction technology	W. M. Leaders	6-7-55	6-7-55	X		
W. B. Tolley to: Knolls Atomic Power Lab. Schenectady, New York	Discuss uranium reduction technology	A. P. Beard	6-9-55	6-10-55	X		
M. T. Walling, Jr. to: Knolls Atomic Power Lab. Schenectady, New York	Discuss separations processes on Purex and Thorex problems, high temperature fuel processing methods and techniques	H. W. Alter	6-20-55	6-24-55	X		
M. T. Walling, Jr. to: Vitro Corporation of America New York, New York	Discuss problems relative to reprocessing of spent power reactor fuels	S. M. Stoller	6-20-55	6-24-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
E. C. Wood to: Battelle Memorial Inst. Columbus, Ohio	Discuss internal friction measurements on uranium and non-destructive testing methods and devices for testing uranium slugs	R. E. Maringer	6-20-55	6-21-55	X		
E. C. Wood to: Oak Ridge National Lab. Oak Ridge, Tennessee	Non destructive testing methods on uranium slugs	R. B. Oliver	6-22-55	6-23-55	X		
E. C. Wood to: E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Discuss non-destructive testing methods and devices for testing uranium slugs	J. N. Wilson A. H. Dexter	6-24-55	6-24-55	X		
FINANCIAL DEPARTMENT - S.F. ACCOUNTABILITY SECTION							
I. Visitors to this Works							
M. D. Harvey National Lead Company Fernald, Ohio	Discuss metal recovery	V. D. Donihee	6-7-55	6-10-55	X	300-L XXX 700	
E. R. Johnson National Lead Company Fernald, Ohio	Discuss metal recovery	V. D. Donihee	6-7-55	6-10-55	X	300-L XXX	
MANAGEMENT - LEGAL SECTION							
I. Visitors to this Works							
W. F. Kennedy Atomic Power Division General Electric Company Schenectady, New York	Discuss overall legal department procedures	W. E. Johnson G. C. Butler	6-13-55	6-14-55	X	700	
L. B. Mackey Research Laboratory Schenectady, New York	Patent survey	G. C. Butler	5-31-55	6-3-55	X	700	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
C. L. Edwards E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Discuss special metering in the 200 and 300 Areas	C. A. Priode	6-7-55	6-8-55	X		200-E XXX 202-A 200-W Redox 300-L 303; 700
M. D. Harvey National Lead Company Fernald, Ohio	Discuss metal recovery	H. E. Berg	6-8-55	6-8-55	X		300-L 303
E. R. Johnson National Lead Company Fernald, Ohio	Discuss metal recovery	H. E. Berg	6-8-55	6-8-55	X		300-L 303
E. Symes, Jr. E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Review maintenance activities and procedures	C. A. Priode E. E. Weyerts C. P. Cabell	6-6-55	6-10-55	X		100-H 105 100-K 105-KE,KW 200-E XXX 202-A 200-W 221-U, Redox, 221-T 300-L 303; 700
M. H. Wahl E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend metallurgy development advisory meeting	C. A. Priode	6-21-55	6-23-55	X		200-W 234, 235 300-L 303
II. Visits to other Installations							
J. E. Maider, Jr. to: General Electric Company Schenectady, New York	Business review	F. K. McCune W. A. Kitts, III	6-16-55	6-17-55	X		
W. N. Mobley to: Aircraft Nuclear Propulsion Evandale, Ohio	Consultation on fuel elements	L. F. Hardy	6-1-55	6-2-55	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
H. O. Monson to: Carbide and Carbon Oak Ridge, Tennessee	Inspect Stores and Receiving facilities	F. Trent (AEC)	6-12-55	6-14-55		X	
OPERATIONS RESEARCH STUDY SECTION							
I. Visits to other Installations							
L. W. Smith, Jr. to: U. S. Atomic Energy Comm. Washington, D. C.	Discuss mathematical planning techniques for Operations Analysis	C. W. D. Thornton (AEC)	5-25-55	6-15-55	X		
P. M. Thompson to: Rand Corporation Santa Monica, California	Discuss linear programming and contributory algorithms for production scheduling	W. Orchard-Hays A. W. Marshall G. Danzig	6-27-55	7-2-55	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
J. S. Kelly Navy Buships Washington, D. C.	Radiation monitors as air particle detectors	H. M. Parker J. W. Healy	6-6-55	6-8-55	X		100-F 108 300-L XXX
J. A. Lieberman U. S. Atomic Energy Comm. Washington, D. C.	Discuss waste disposal activities including river studies, disposal of wastes into the ground, and separation of specific nuclids from waste streams	D. W. Pearce J. W. Healy	7-5-55	7-5-55	X		200-W 221-U 300-L XXX
J. L. Terry, Jr. U. S. Air Force Washington, D. C.	Discuss work at animal farm	D. E. Warner	6-6-55	indefinite	X		100-F 108 300-L XXX
C. V. Theis U. S. Geodetic Survey Washington, D. C.	Conference and field inspection re disposal of wastes to ground	D. W. Pearce R. E. Brown	5-31-55	6-3-55	X		200-W 221-U 300-L XXX 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
T. N. McVay (consultant to ORNL) Oak Ridge, Tennessee	Discuss geology, adsorption of radio-active isotopes in ceramic material and waste disposal	D. W. Pearce D. W. Phodes	6-18-55	6-20-55	X		200-W 221-U 300-L XXX 700
J. M. Ward Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss geology, adsorption of radio-active isotopes in ceramic materials and waste disposal	D. W. Pearce D. W. Rhodes	6-20-55	6-20-55	X		200-W 221-U 300-L XXX
II. Visits to other Installations							
L. K. Bustad to: Crocker Radiation Lab. San Francisco, California	Discuss work with iodine	P. Durbin	6-6-55	6-8-55	X		
L. K. Bustad to: Donner Laboratories San Francisco, California	Discuss work with iodine	C. Tobias	6-6-55	6-8-55	X		
L. K. Bustad to: Naval Rad. Defense Lab. San Francisco, California	Discussion with representatives of Dept. of Justice concerning Utah sheep losses	Lt. Col. Vennstra	6-6-55	6-8-55	X		
R. C. Thompson, Jr. to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Visit laboratory in conjunction with research work in Group H-4 Laboratory	W. Langham	6-20-55	6-20-55	X		

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RADIOLOGICAL SCIENCES DEPARTMENT

JUNE 1955

SUMMARY

Thirty-seven informal, twelve Class I and one Class II radiation incidents were recorded. The Class II incident involved a hand exposure of about 25 rads.

Included in the Class I total were three cases of failure to wear personnel meters; an active communications program on meter wearing has started.

The I^{131} contamination situation improved as expected in summer meteorological conditions, rather than from any appreciable reduction in emission.

Two bioassay cases showed apparent depositions of plutonium between 90% and 100% of the permissible limit. If confirmed at this level, they will be the highest on record, originating at Hanford. This is of major concern because neither case has been specifically identified with a known exposure incident.

Substantial savings in the contaminated laundry resulted from field development work. This type of study is to be considerably amplified in the near future.

Good progress is reported in several phases of the assignment to establish maximum reactor operation with reactor effluent discharged into the Columbia River.

The whole concept of radiation protection by isotopic dilution of noxious effluents is under careful scrutiny. On the whole, it appears that, under most practical conditions, isotopic dilution is a futile procedure. Development of a general theory to cover all cases is being attempted.

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RADIOLOGICAL SCIENCES DEPARTMENT

JUNE 1955

The month-end force of 410 included 37 supervisors, 90 engineers and scientists, 21 clerical and 262 other personnel.

Number of Employees on Payroll

Beginning of Month	407
End of Month	410
Net Increase	3

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.

Name	Title of Invention
W. G. Spear	Transistor High Voltage Supply
J. W. Baum	"Electric Wind" Air Mover for Air Sampling
N. L. Dockum and R. E. Rugg	Simplified Microtome Knife Holder

There were 50 radiation incidents, including 12 Class I incidents and one Class II incident. The Class II incident concerned a hand exposure of about 25 rads.

The most troublesome finding of the month concerned two depositions of plutonium apparently in the range of 90% to 100% of the maximum permissible body burden. Neither case could be clearly related to a specific radiation incident in the plant; investigation of this point is continuing. Because the rate of elimination of plutonium from the body is a complex function of the time following deposition, it is never possible to compute body burden accurately from a short series of bioassays, when the intake date is not known. For this reason, the reported burdens may be modified later. In the meantime, the men must be kept from work involving even slight risk of further plutonium contamination. It is clear that this is an interference with the work load, and a potential cause of alarm to the individuals, if not explained appropriately. The department is currently working on a method of detecting internal deposits of plutonium by means of the very weak signal of the low energy x-ray emission of plutonium. This method would eliminate the long delays inherent in bioassay procedures, but its success with small deposits is not assured. Another feasible method was analyzed in 1945. This would involve slow neutron irradiation of the body, and measurement of the fast neutrons generated by fission of the plutonium. The technique has not been applied because the required neutron flux and the intense irradiation

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Radiological Sciences Department

around the fissioned plutonium would probably give more biological damage than would the original offending material.

Plans are progressing for the design and construction of a well-shielded facility in which the new approach to monitoring deposits of plutonium and other internal emitters can be developed.

Radioiodine emission averaged about 10 curies per week, with a maximum daily emission of 3.6 curies. This was close to the reasonable target of 10 curies per week, with not more than 3 curies in any one day. Although total emission was not substantially different from that of the preceding few months, the ground deposition pattern materially improved. This was due to the more favorable meteorological conditions. Such a change was predicted months ago; the prediction was a major factor in not proposing a reduction in production while ground deposition limits were being temporarily exceeded. It is just this type of judgment applied to individual cases that will be most affected when radiation protection methods are written as established or mandatory codes. Despite the inevitability of such regulation for the nation as a whole, the net effect on a voluntarily well-controlled operation, such as that at Hanford, will be adverse.

Field development tests have led to new contaminated-laundry procedures that reduce cost of laundry and also increase garment life. Similar substantial savings are expected to materialize in many other areas of activity as the proposal to expand field development is implemented.

As the atomic energy business expands, it is becoming more and more important for employers to examine the previous radiation work history of prospective employees. Such a program operates here. That 289 new HAPO employees in the first half of 1955 (35% of the total) had prior radiation histories will be a surprising fact to many. Of these, only 30 seemed to require an initial bioassay check; none required work restriction.

Further progress has been made in more precise delineation of the expected radioisotope content of reactor water, which is vitally needed to establish maximum power levels under present methods of reactor operation. The complexity of the problem lies in the non-linear relationship between water activity and reactor power level. Previously, the observed exponential rise of activity of some components with operating temperature has been ascribed to increased film hold-up on reactor tube surfaces. It has now been shown that much of this activity arises from neutron activation of trace materials in the aluminum surfaces themselves. Corrosion of the aluminum then releases the active materials to the water. Essentially all the Cu^{64} and Sc^{46} activity originates in this way, and perhaps about 60% of the usual Mn^{56} load is similarly created. These findings will substantially increase the reliability of future forecasts, because accurate activation analyses of the aluminum surfaces can be combined with experimental data on tube corrosion rates to give good values for total released activity.

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An important aspect of future reactor operation is the permissible amount of dichromate that can be used for corrosion control and then returned to the river. It has been shown before that biological damage to aquatic organisms from chromium compounds occurs at a concentration substantially below that appropriate for drinking water. More definitive tests have been made to provide a reliable criterion for future operation. Beyond question, there is significant damage at 0.02 ppm chromium. There appears to be borderline injury at concentrations as low as 0.006 ppm. Future planning should probably be based on a limit not higher than 0.01 ppm Cr. With contemplated reactor flows, this limits reactor water to a maximum concentration of 0.2 - 0.3 ppm Cr, or 0.6 - 0.9 ppm measured as sodium dichromate ($Na_2Cr_2O_7 \cdot 2H_2O$).

The major problem of establishing realistic permissible limits for Columbia River contamination is being attacked for the most part by biophysical methods. This will lead to detailed analyses of the water contamination components and a calculation of the combined permissible limit by the conventional (but quite dubious) methods of NBS Handbook 52.

This program is now being supplemented by direct biological checks of the water's effect on rats. To accelerate the results it is necessary to make a rapid concentration of the effluent. To date, 10 and 20 fold concentrations have been achieved. Higher concentrations will have to be achieved, or much longer exposure times used to get the necessary sensitivity.

The whole concept of environmental radiation protection by isotopic dilution is undergoing careful scrutiny. In some past practices it has been felt that a mistake in disposal could be corrected by using isotopic dilution. Some of the guiding texts on waste disposal, such as in hospital practice, specifically require additions of inert carrier to radioactive wastes. The recent findings at this laboratory show conclusively that under most natural conditions, isotopic dilution is entirely futile. The future interest in this field is so great that attempts are being made to develop a generalized theory on this topic. What seemed to be a promising start received a set-back this month when experiments designed to test a plausible theory gave contrary results. These tests will probably serve to define the several parameters, including a few obscure ones, that govern the phenomenon.

Problems with oxides of nitrogen and nitric acid mist generated by new processes in the 300 Area are being solved by cooperative efforts of the Industrial Hygiene and Manufacturing Department forces. It is believed that an organization that recognized the potentialities for preventive industrial hygiene at the planning stage would detect and eliminate such problems at an earlier stage.

The true budget performance of the department for FY 1955 is not yet available, but the general picture is as follows:

Research and development funds allocated by the AEC Division of Biology and Medicine showed an underrun of 1.6%; this is as close as can be expected since

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Radiological Sciences Department

some elements of cost are not controllable by the department. In protection of plant and personnel, the position was less satisfactory with a balance of 4.5%. No single cause for the underrun exists. A contributing factor is the slowness in feeding back corrective action. As an example, at mid-year, the brakes were applied to expenditures because there seemed to be a potential overrun. The off-balance amount is probably about equally divided between items under department control, such as manpower, and items not controllable on a short-term basis, such as the actual placement of orders and receipt of material in a given year. To achieve close control of the budget, additions to the departments present skeleton administrative force would be needed.

At the section level, biology showed good results in all budget phases, a product in part of the stabilized work force. Other sections, in trying to expand in key scientific activities, had difficulty in acquiring individual specialists of adequate caliber on the scheduled dates. Radiological Engineering fell substantially below its budget plan, a situation that was recognized in time to assist the Engineering Department by an approved transfer of funds.

Other administrative items of interest include the holding of a general department meeting and the arrival on site of 5 AEC Radiological Physics Fellows who have completed the academic phase of their training at the University of Washington.

Five of the ten papers submitted for the Geneva Conference appear on the program. This is 50% acceptance, versus 34% for U.S. papers as a whole. In terms of abstracts submitted, Radiological Sciences acceptance was a high score of 42%, compared with 17% for all U.S. abstracts.

H M Parker

Director,
RADIOLOGICAL SCIENCES DEPARTMENT

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APPENDIX

1. Condensed Exposure Records

Type	Number of Readings	Potential High Results	Confirmed High Results
Pocket chambers - gamma	270,448	16	0
Pocket chambers - slow neutron	1,992	0	0
Film Badges - beta-gamma	49,894	49	0
Neutron film	594	0	0
Pu bioassay	1,073	27	3
F. P. bioassay	1,112	1	0
U bioassay	509	0	0
Alpha hand counts	56,339	2	0
Beta hand counts	72,459	1	0

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2. Regional Monitoring Records

Sample Type and Location	Activity Type	Average Activity Density µc/ml	Trend* Factor
Drinking Water and Related Materials			
Benton City Water Company Well	alpha	1.3×10^{-8}	--
Richland, N. Richland, Benton City Wells	alpha	$(0.6 \text{ to } 1.3) \times 10^{-8}$	--
100 Areas	beta	$(0.8 \text{ to } 4.0) \times 10^{-7}$	-2
200 Areas	beta	$(0.6 \text{ to } 1.4) \times 10^{-7}$	-2
Pasco, Kennewick, McNary Dam	beta	$(<0.5 \text{ to } 1.8) \times 10^{-7}$	-2
Backwash solids - Pasco Filter Plant	beta	5.2×10^{-3} µc/gm	-2
Backwash Liquids - Pasco Filter Plant	beta	5.9×10^{-7}	--
Sand Filter - Pasco Filter Plant	beta	5.6×10^{-5} µc/gm	-3
Anthracite Filter - Pasco Filter Plant	beta	1.3×10^{-4} µc/gm	--
Other Waters and Related Materials			
300 Area Wells #1, 2, 3	alpha	$(1.1 \text{ to } 5.8) \times 10^{-8}$	+4
300 Area Well #4	alpha	8.9×10^{-8}	+2
Well #4 measured as Uranium	U	9.1×10^{-8}	+3
Other Wells on the Reservation **	beta	$(<0.05 \text{ to } 5.5) \times 10^{-6}$	+110
Columbia River - Hanford Ferry	beta	9.3×10^{-6}	-2
Columbia River - below reactors	beta	6.7×10^{-6}	-2
Columbia River - Patterson to McNary	beta	3.5×10^{-7}	--
Columbia River - Shore mud	beta	$(0.25 \text{ to } 1.1) \times 10^{-4}$ µc/gm	-2
Raw Water - Operating Areas	beta	$(<0.05 \text{ to } 1.2) \times 10^{-6}$	-2
Reactor Effluent Retention Basins to River	beta	7,100 to 31,000 µc/sec/reactor $(0.87 \text{ to } 6.0) \times 10^{-3}$	--
Reactor Effluent Retention Basins to River	alpha	<0.04 µc/sec/reactor $<5 \times 10^{-9}$	--
I-131 in Farm Wastes to River	I-131	64 µc/day 1.2×10^{-6}	+3 +2
I-131 in Columbia River - Hanford	I-131	1.0×10^{-8}	-8
300 Area Pond Inlet	alpha	6.1×10^{-7}	--

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Radiological Sciences Department

Sample Type and Location	Activity Type	Average Activity Density $\mu c/ml$	Trend* Factor
Atmospheric Pollution			
Gross Alpha Emitters	alpha	$(<4.0 \text{ to } 6.0) \times 10^{-15}$	--
Gross Dose Rate - Separations Areas	beta - gamma	0.63 to 1.7 mrad/day	-2
Gross Dose Rate - Residential Areas	beta - gamma	0.24 to 0.92 mrad/day	--
Active Particles - Separations Areas	beta	$(0.35 \text{ to } 1.1) \times 10^{-12}$	--
I-131, Separations Areas	I-131	$(0.07 \text{ to } 2.2) \times 10^{-12}$	--
I-131, Separations Stacks	I-131	1.4 curies/day	--
Ruthenium, Separations Stacks	Ru-103,106	<0.01 curie/day	--
Active Particles - Wash., Idaho, Oregon, Mont.	-	0.003 to 0.43 ptle/m^3	+4
Active Particles - HAPO	-	0.002 to 0.10 ptle/m^3	--
Tritium (as oxides) - Reactor Stacks	T	0.17 curie/day	--
Vegetation			
Environs of Separations Areas	I-131	$(<0.3 \text{ to } 2.6) \times 10^{-5}$ $\mu c/gm$	--
Residential Areas	I-131	$<3.0 \times 10^{-6}$ $\mu c/gm$	-2
Eastern Washington and Oregon	I-131	$<3.0 \times 10^{-6}$ $\mu c/gm$	--
Non-Volatile Beta Emitters - Wash. and Oregon	beta	$(2.6 \text{ to } 4.8) \times 10^{-5}$ $\mu c/gm$	--
Alpha Emitters - Separations Areas	alpha	$(0.8 \text{ to } 3.4) \times 10^{-7}$ $\mu c/gm$	-2
Alpha Emitters - 300 Area	alpha	1.2×10^{-7} $\mu c/gm$	+2

* The trend factor shows the n-fold increase (+) or decrease (-) from last month, where values of n less than 2 will not be noted.

** Test wells with maximum values located near 107 effluent emergency basins in 100-B and 100-D Areas.

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FINANCIAL DEPARTMENT MONTHLY REPORT
JUNE, 1955

Meetings were held with members of the HOO Finance Division and a representative from the Office of Controller for Accounting, AEC, Washington, D.C., relative to recasting Products Cost Reports retroactive to January, 1954 for Reactor production in MWD's instead of grams.

Copies of Document HAN-59000, "Estimates of Appropriations for Fiscal Year Ending June 30, 1957," which represents the official transmittal of the Budget for FY-1957 and Revision of Budget for FY-1956 from HOO-AEC to Washington - AEC, were received by General Electric on June 24, 1955. The following schedule represents a summary of the Plant and Equipment budget as submitted by HOO-AEC:

(Dollar Amounts in Thousands)	9200 Fissionable Mat. Prog.	9300 Weapons Program	9700 Community Program	Total Plant & Equipment
Projects Under Way and Authorized - FY-1955	$ 107 947	$ 3 278	$ 309	$ 111 534
New Construction - FY-1956	29 820	-	313	30 133
New Construction - FY-1957	38 900	-	470	39 370
Total	$ 176 667	$ 3 278	$ 1 092	$ 181 037

The total request for $181,037,000 for current projects and new projects budgeted through FY-1957 represents a decrease of approximately 6.3% below the amount requested by General Electric Company. The 9200 Program was decreased 6.1% or $11,381,000 and the 9700 Program was decreased 44% or $861,000. Comments regarding HOO-AEC action are being prepared and a formal letter will be transmitted to HOO-AEC as soon as all pertinent information is received.

During the month of May expenditures for Construction Work In Progress totaled $2.5 million dollars, the largest expenditure in any one month since March, 1954. The average monthly expenditure for the past 12 months ending May 31, 1955 was approximately $1.7 millions. The large increase in May is primarily due to the increased activity on CG-558 - "Reactor Plant Modifications for Increased Production," which accounted for 44% of the total construction expenditures in May.

The AEC budget submission to Washington for FY-1956 and FY-1957 was reconciled to our proposed operating standards. No serious deviation was found. A review was also made of legislation being submitted to Congress for FY-1956 appropriations.

In connection with the obligation of funds through December 31, 1955, required information was furnished the AEC Budget Division in June and

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appropriate supplemental agreement to the prime contract was drafted by them. Additional funds totaling $70,611,000; $53,850,000 for HAPO and $16,761,000 for KAPL, were provided, increasing total obligations under the contract to $896,833,000 and $182,584,000 for HAPO and KAPL respectively. An over-all factor for contingencies of approximately $10,000,000 is included in the total funds to be obligated.

Subcontract completion certificate, release and waiver of lien, certificate as to notebooks, reports, and inventions properly executed for Special Agreement No. G-5 and G-12 with National Carbon were received on June 22, 1955.

Educational meetings were held during June with plant personnel to discuss Measurements responsibilities. Further meetings are scheduled for July.

In the SS Accountability Section, an appreciable reduction in work load has been accomplished with the elimination of charge-by-charge dissolver accounting in Redox. Satisfactory control of the plutonium isotope correction factor is provided by measurements and is no longer associated with metal history. Similar work reduction activities are under consideration at Metal Fabrication, where direct entry by the operators for source data will simultaneously comply with Run Book and source data requirements.

Liquidation activities associated with normal uranium inactive materials have now achieved all economic recovery. Prior accumulations were associated with obsolete processes: triple dip canning, machining and melt plant operations.

The IBM Type 702 Electronic Data Processing Machine arrived June 6 and was moved into the new room in the 713 Building. Air conditioning was available on the 8th so machine testing by IBM Customer Engineers could begin. Testing continued through the end of the month.

A report was issued on June 21 outlining a proposed electronic data processing machine application for the Regional Radiation Measurements Unit. The proposed procedure includes the calculation of results and preparation of reports concerning the samply process. Through the use of a tape-preparing typewriter, laboratory findings are to be reported and the data transmitted by punched paper tape to Procedures and Computing for further processing.

The IBM Type 046 panel wiring and testing for conversion of IBM Type 884 tapes for transcription and up-dating plant accounting history records has now been completed. This job, which utilized six of the seven program indications, all available selectors and distributors, and all eight reading stations, constitutes a good test of what can be accomplished on this machine.

A special request for cost and descriptive data of buildings and equipment could be operated by outside contractors was received by teletype from Washington this month. Facilities involved in this request include office machines, transportation, water systems, sewage disposal systems, and laundries.

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Improvements to land and other facilities presently maintained by School District #400 in the amount of $783,204 have been analyzed and transferred to AEC. These costs have been carried in the General Electric plant and equipment accounts since the plant appraisal in 1949.

Final results of the third annual physical inventory of electrical materials in the custody of Electrical Utility Section reflected a net overage of $457, or 1.46 percent over the book value of $31,377. Beginning July 1, 1955 custody of this material will be transferred to Stores. Final results of the third annual physical inventory of communication supplies in the custody of Auxiliary Operations and Plant Protection Section reflected a net overage of $1,380, or 7.9 percent over the book value of $17,476.

Disposition by AEC of temporary facilities at White Bluffs is currently in progress. It has been agreed that the Engineering Department will assume landlord responsibility for buildings transferred to G.E. Water, sewer, and electrical distribution facilities required to service these buildings are being transferred from AEC to G. E., Manufacturing Department; and telephone distribution facilities will be transferred to G. E., Employee and Public Relations Department.

The main Blaw-Knox warehouse in the 200 East Area will be transferred to G. E., Manufacturing Department, as of June 30. This building will be used by the Separations Section as a general purpose warehouse (primarily for the storage of essential materials).

Detailed reports for the Financial Department appear on succeeding pages, as follows:

Summary of Cash Disbursements, Receipts and Advances	I - 4
Auditing Section	I - 5
Budgets and Measurements Section	I - 6
Contract Cost Section	I - 7 through I - 10
General Accounting Section	I - 11 through I - 20
Personnel Accounting Section	I - 21 through I - 23
Procedures and Computing Section	I - 24 through I - 26
Property Accounting Section	I - 27 through I - 34
SS Accountability Section	I - 35 through I - 38
Personnel and Organization Statistics	I - 39 through I - 40

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SUMMARY OF CASH DISBURSEMENTS, RECEIPTS AND ADVANCES

A summary of cash disbursements and receipts (excluding advances of $6,200,000 and $6,500,000, respectively, by the Atomic Energy Commission) for the months of June and May, 1955, is shown below:

Disbursements	June	May
Payrolls (net)	$3 054 200	$3 031 834
Materials and Freight	1 678 165	2 051 434
Payroll Taxes	714 265	836 732
Payments to Subcontractors	555 857	551 933
Group Insurance Premium	261 293	144 118
United States Savings Bonds	206 323	310 235
Pension Plan - Employees' Portion	93 623	107 485
Travel Advances to Employees	75 665	68 574
Income from Invested Funds	39 534	-0-
ADM 1578 Special Expenses for Year 1954	-0-	85 254
Business and Occupation Tax Transmitted to AEC	-0-	2 204
All Other	120 260	150 226
Total	6 799 185	7 340 029
Receipts		
Refund on Group Insurance Premium Year 1954	503 758	-0-
Rent	124 145	124 133
Electricity	70 346	88 246
Hospital	61 238	54 021
Telephone	52 930	52 117
Income from Invested Funds	39 534	-0-
Sales to AEC Cost-type Contractors	26 010	24 662
Sundry Accounts Receivable	14 365	69 235
Refund of Travel Advances to Employees	14 246	8 313
Bus Fares	8 188	8 891
Refunds from Vendors	3 234	301
Refund of Business and Occupation Tax	-0-	2 204
Other	6 425	4 731
Total	924 419	436 854
Net Disbursements	$5 874 766	$6 903 175

Outstanding advances as of June 30, and May 31, 1955 were as follows:

	June	May
Cash in Bank - Contract Accounts	$1 732 738	$1 407 504
Cash in Bank - Salary Accounts	15 000	15 000
Total	$1 747 738	$1 422 504

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AUDITING SECTION
MONTHLY REPORT - JUNE, 1955

Reports were issued for the completed audits listed below:

General Accounts
Graduate School of Nuclear Engineering
Traffic Activities

Field work was continued on the following Audits:

Bank Account Reconciliation and Cash Controls
Construction Work in Progress
Deposits, and Income from Investments
Traveling, Living and Entertaining Expenses

The following audits were started during the month:

General Electric Suggestion Plan
Plant Libraries
Work Orders

Follow-ups were made to determine the extent of compliance with recommendations made in reports of the following audits:

Fabrication Work in Progress
Procurement and Maintenance of Office Equipment

On June 6, B. M. Dobbs, who was an employee of the Financial Department prior to October, 1951, was reemployed as an auditor. As of June 30, R. L. Morton transferred to Auditing Section from Property Accounting Section.

Three exempt employee information meetings were held during the month.

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BUDGETS AND MEASUREMENTS SECTION
MONTHLY REPORT - JUNE, 1955

General

Six of our expected fifteen business graduates reported during June. However, three of these six are still subject to military service and may be called in the near future. In the meantime, the rotational training program has been started. None of the new employees have "Q" clearance yet.

The regular meeting of the Suggestion Board included a review of a previous determination to award a Financial Department employee $500.00. Agreement remained without change in amount and approval has been requested from the Commission.

Budgets

Bogey statements and cost charts were prepared on schedule and distributed for monthly cost meetings of the General Manager and the Manager-Manufacturing. The budget group is operating short one employee, which hampers work considerably. It is hoped to rectify this situation as soon as incoming business graduates are cleared for regular assignments.

The control budget prepared during May was received by the Contract Cost Section with operating and staff departments. Several suggested charges are being examined for incorporation in the final budget.

The AEC submission to Washington for FY1956 and FY1957 was reconciled to our proposed operating standards. No serious deviation was found. A review was also made of legislation being submitted to Congress for FY1956 appropriations.

Measurements

Two new employees reported during June. S. G. Smolen transferred from Manufacturing as a Measurements Specialist on June 1, and Z. E. Carey transferred from Radiological Sciences to a similar capacity. Interviews were held with Engineering Personnel and J. M. Lutton was selected for transfer to Measurements. This becomes effective July 18. We will then be short five employees in the Measurements Project representing one secretary and four clerks.

Several educational meetings were held with plant personnel to discuss Measurements responsibilities. These included "T" Plant in Separations Section, Reactor Section personnel, meetings with all Financial Department sections and several contacts with Sections in the Employee and Public Relations Department. Further meetings are scheduled for July.

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CONTRACT COST SECTION
MONTHLY REPORT - JUNE 1955

Employee and Public Relations Cost Unit

Analysis letter covering unit cost information was prepared and forwarded to the manager of the Auxiliary Operations and Plant Protection Section with appropriate copies going to interested sub-section managers. Trends and variances in unit costs were reviewed and explained.

Performance Bogeys for FY 1956 were prepared and discussed with Section and Department Management and have been submitted to the Budgets and Measurements Section.

A concerted effort was made in the Community Section to obligate construction funds before expiration of deadline dates. Although most of this activity centered in the Engineering Unit of the Community Section, Financial expedited the process as much as possible.

An analysis of X-ray fees was prepared for use in making possible changes in hospital charges for this service. Hospital Management is now studying the report.

A revised Disposal Bill covering transfer of the community of Richland to local entities and sale of houses and other properties was reviewed during the month in conjunction with the Community Transfer Specialist and others concerned with the disposal problem. This review was in preparation for the public hearing held in Richland on July 5, 1955.

Budgets for FY 1956 covering travel and living variation expense, entertainment expense, and expenditures for attendance at meetings of professional and trade societies were prepared, and after review with the Department Manager, submitted to the General Books Unit.

Because certain changes in Legislation covering appropriations for construction purposes in effect provided that Community Projects be financed from the overall provision for General Plant Projects, department management was informed that considerable difficulty might be encountered during the coming fiscal year in securing financing for various Community and Hospital projects considered essential; and a letter was prepared for the Department Manager's signature suggesting that an attempt be made to secure additional funds from the Atomic Energy Commission for these purposes.

Engineering Cost

The Technology Cost Sub-unit during June has developed procedures and practices to conform with recommendations outlined in the Internal Audit report concerning cost accounting activities for this sub-unit. Analyses and considerations of the recommendations not yet adopted are underway.

A Technology Cost representative observed the physical inventory taken by Technical Shops' personnel pertaining to "5930" material inventory in the 328 Building on June 25, 1955. Results of the physical inventory will be available in order to make adjustments, if necessary, in FY 1955 operating costs.

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In an effort to make Design Cost accounting methods and procedures more adaptable to automatic accounting machines, discussions were held with representatives of Design Planning on the use and control of Design Orders. From these discussions it was decided to change the numerical code on Design Orders from six digits to five digits. The transition to a five-digit code will be accomplished by closing out at the end of FY 1955 all Design Orders liquidating to Research and Development and establishing new Design Orders with five-digit codes for FY 1956. Design Orders established in FY 1955 for Design Projects and customer work will remain open until the work is physically completed. All Design Orders established in FY 1956 for CWIP and customer work will be assigned five-digit codes. Design Orders established for customer work during FY 1956 will utilize work order numbers issued by other departments at HAPO.

Preprinted forms used in the preparation and issuance of monthly operating reports were revised and brought up to date for use during FY 1956. The forms were forwarded to Forms Cont for their review and action so as to receive the finished product in time to issue July operating reports.

Reconciliations of physical inventories of Minor Construction Stores taken May 31, 1955 were completed and the required adjustments made. Additional physical inventories are now scheduled so as to complete all captions by November 28, 1955.

An operating procedure for Minor Construction Stores was completed and distributed in June. The procedure was placed in effect progressively with complete adoption scheduled as of July 1, 1955.

At the direction of the Atomic Energy Commission reserves for excess construction materia. and equipment were closed and balances transferred to Minor Construction Miscellaneous Store Inventory Reserve. The stores inventory reserve will be utilized in the future to cover losses incurred in excessing materials and equipment as well as inventory adjustments.

As a result of discussions with CPFF Service Contract Payroll representatives, the contract is now consolidating all manual crafts on the J. A. Jones payroll and spreading the cost t cost codes on an average rate. Likewise, electricians and linemen, and plumbers and fitte are consolidated on the sub-contractor's rolls. This consolidation and use of average rat has resulted in approximately a six hour savings per week in time expended to cost the CPF Service Contract Payroll.

A meeting was held June 20, 1955 with representatives of the Project Section to review the effect of standard rates; and, as a result of this meeting, the following action was taken: (1) All cost accounts for Reactor Projects Sub-Section were closed and the existing over-liquidation transferred to Project Engineering Sub-Section, which absorbed the personnel and work formerly assigned to Reactor Projects Sub-Section; (2) Project Engineering standard rate is to be increased from $48 per man day to $50 per man day effective with July business (3) the following amounts were distributed to projects: a $30,000 over-liquidation of Minor Construction Indirect Expense, b $14,000 over-liquidation of CPFF Service Contract Fee, c $15,000 over-liquidation of Small Tools Maintenance, and d $32,825 over-liquidation Major Equipment Maintenance; (4) the liquidating rate for Minor Construction Stores operation was reduced from 25% to 17% effective July 1, 1955; and (5) various rates for reproduction services were increased effective with July business.

A preliminary meeting was held with Procedures and Computing representative to formulate plans and procedures for preparatory work necessary to schedule and program the placing of Project Cost on IBM.

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Round table discussions with all employees were held during June with discussions centered around the recent attitude survey.

General and Consolidations Cost Unit

Preparations of the FY 1956 Bogey were completed during the month. This included General and Administrative Expense, Protection of Plant and Personnel Expense, Research and Develop ment for the Biology and Medicine Program, and Radiological Engineering.

A study was made of IBM rental rates to insure that the standard rate being used was liquidating the machines properly.

Store orders inventory account listings were revised to allow reporting costs by organizational section totals.

The work identification codes for the Biophysics Section, Methods Unit, were revised to con form to the new AEC classifications for reporting costs of this program.

Due to the revision of OPG 08.2 separate cost accounts have been established for telephone and telegraphic expense in order to accumulate these costs separately.

A meeting was held with personnel in the Manufacturing Cost Unit and Inventory Accounting to discuss the unassignable transportation charges that are presently being charged to General Administrative Expense. A representative list of types of material on which freigh should be charged directly to inventory accounts was submitted to inventory accounting; and they, in turn, are to insure that the freight charges follow the materials.

Manufacturing Cost Unit

A major activity during the month was the preparation of the Manufacturing Department FY 1956 Performance Bogey, most of which was complete by month-end.

With the construction work in Metal Preparation's 303 Area nearing completion, a code stru ture is being established which will provide cost information for each piece of equipment major importance in this Area. Upon completion of this portion of the code structure, all of the buildings and major pieces of equipment in the 300 Area will be covered.

A meeting was held with Transportation, General Books and Manufacturing Cost personnel regarding backcharges in an attempt to speed up the billing on accident claims. A report of this meeting with recommendations of the representatives was prepared.

A review of Transportation Section standard billing rates was initiated to establish, where necessary, new standard billing rates starting July 1, 1955. IME rates for all maintenance units were reviewed and necessary revisions made for use beginning July 1, 1955.

A summary of HAPO inventories was prepared which indicated responsibility by department based upon dollar value at May 31, 1955. In addition, information pertaining to budgeted amounts was included with reference to the June 1955 Revised AEC Financial Plan.

The Financial Representative for the Metal Preparation Section prepared cost data for the Power and Maintenance Sub-Section, covering the 300 Area Productive Maintenance Program, for presentation at the Department Manager's Monthly Cost Meeting. Assistance was given to the 300 Area Landlord in preparation of the annual Landlord Report and all rental rates

are being reviewed with revisions to be completed prior to start of FY 1956. Three meetings covering accounting procedures and cost reduction programs were conducted for exempt personnel in the 300 Area.

A possibility of establishing a needle card system, which would give greater flexibility as well as save considerable time in preparing the monthly report on equipment not included in construction projects, is being considered. Vendors have been contacted in an attempt to get a standard size card for this purpose. An estimated 40 hours per month can be saved if this system is adopted.

A meeting was held with Stores Sub-Section personnel to discuss spare equipment held in storage. (Revisions are being made to Stores procedures in spare equipment accounts to conform with the AEC Accounting Manual, Part I.) We are in the process of revising Manufacturing Cost procedures covering spare equipment and incorporating the revised method of handling.

ACCOUNTS PAYABLE UNIT (Continued)

Other Statistics:

Number of vouchers recorded	5 046	4 471
Number of checks issued	2 739	2 545
Number of freight bills paid	1 595	1 734
Amount of freight bills paid	$362 483	$349 603
Number of purchase orders received	2 845	2 472
Amount of purchase orders received	$2 264 934	$2 180 033
Amount of cash discount earned	$7 995	$7 848

ACCOUNTS RECEIVABLE UNIT

The gross accounts receivable balance at June 30, 1955, amounted to $259,145, a decrease of $20,421 from the balance of $279,886 at May 31. The reduction results primarily from decreases in Kadlec Hospital, Rental and Electricity accounts.

The gross balance of $259,145 is approximately $55,000 less than the balance at June 30, 1954 in spite of an increase in total billings of $116,000 in FY-1955. Total charges to accounts receivable during the year amounted to $7,416,264 and collections aggregated $7,471,750. Four types of receivables accounted for the majority of charges during the fiscal year: Rents, $4,744,939; electricity, $877,234; services rendered at Kadlec Hospital, $746,471; and telephone, $655,415.

During the month, accounts determined uncollectible amounting to $3,477 were written off and assigned to the Atomic Energy Commission. Of the total, $2,857 represented uncollectible Kadlec Hospital accounts, and $620 represented rental, tenant service, and utility accounts.

Accounts at collection agencies at June 30, 1955 totaled 200 and amounted to $14,500. The types and amount of these accounts may be segregated as follows: Kadlec Hospital, $7,500; Telephone, $2,500; Rents, $2,000; Sundry, $1,500; and Electricity, $1,000.

A final payment was made in June to Commonwealth, Inc., covering deductions from General Electric Company employees' salaries for barracks and trailer space rentals at North Richland. The facilities in North Richland were transferred to the Army effective June 30, 1955, and we made deductions through May 31, 1955.

Disconnect notices were mailed to 149 telephone subscribers during the month, and the service of eight was suspended. During the month, 460 delinquent notices and 124 final notices were mailed to electricity customers. The service of 14 was suspended.

Revisions were made to both telephone and electricity disconnect notices during June, to include on the notice the statement "partial payment will not defer service suspension." On the final notice concerning delinquent electricity billings, provision was made for the collection of a meter deposit prior to reconnection, after service has been disconnected for non-payment.

GENERAL ACCOUNTING SECTION
MONTHLY REPORT--JUNE, 1955

ACCOUNTS PAYABLE UNIT

In connection with the fiscal year closing, effort was made to record all invoices received in Accounts Payable through June 30th. Volume of invoices received and processed during the last week in June was unusually heavy, as indicated by the June 30th (one day) recording of 787 vouchers amounting to $498,632. A total of 5,046 vouchers, amounting to $4,089,357, were booked in June.

During the week ending July 10, receiving reports and purchase orders were reviewed in order to price and accrue for material received through June 30, for which billing had not been received. The total amount of this accrual was $285,483, of which $202,282 pertained to construction work in progress.

Purchase orders received during June numbered 2,845 and amounted to $2,264,984. This appears to indicate that the work volume in Accounts Payable will remain at a high level.

Cash discount earned during the month amounted to $7,995 and for FY-1955 aggregated $75,000.

Active contracts handled by Accounts Payable, excluding requirements contracts, numbered 34 and contract commitments at the end of June amounted to $408,325. Payments on these contracts in June totaled $61,428. Requirements contract orders placed during June numbered 18 in the amount of $714,878, and commitments at the end of June amounted to $914,278. Payments under requirements contracts for the month were $496,329.

Subcontract completion certificate, release and waiver of lien, certificate as to notebooks, reports, and inventions properly executed for Special Agreement No. G-5 and G-12 with National Carbon were received on June 22, 1955.

The move of Accounts Payable from the 101 Building to W-21 was accomplished on Saturday, June 18th. Work routines were resumed on the following Monday without interruption.

Accounts Payable:	June	May
Balance at beginning of month	$ 648 753	$ 870 812
Vouchers entered	4 089 357	3 888 354
Cash receipts	3 249	301
	4 741 359	4 759 467
Less:		
Vouchers paid	3 538 667	3 997 960
Reversal of accruals	0	112 754
	3 538 667	4 110 714
Balance at end of month	$1 202 692	$ 648 753

1206870

ACCOUNTS RECEIVABLE UNIT (Continued)

Other statistics pertaining to accounts receivable are summarized below.

Account	Balance 5-31-55	Net Charges	Collec-tions	Balance 6-30-55	Bills Issued in June
Kadlec Hospital:					
Active	$ 97 153	$ 51 800	$ 68 658	$ 80 295	1 137
Collection Agencies (78 Accounts)	7 520	378	257	7 641	
Electricity	40 795	68 340	71 212	37 923	3 964
Telephone	33 380	55 155	54 301	34 234	6 861
Sundry:					
Active	26 660	22 794	18 285	31 169	337
Collection Agencies (122 Accounts-a)	7 774	45	933	6 886	
AEC Cost-type Contractors	16 654	28 350	26 011	18 993	31
Rents	25 769	386 476	393 079	19 166	6 823
Equipment Sales to Facilities (1 Account)	21 638		349	21 289	
Safety Shoes	2 167	2 332	3 301	1 198	278
Loans to Employees (2 Accounts)	356		5	351	
Sub-total	$279 866	$615 670	$636 391	$259 145	19 431
Reserve for Bad Debts	25 046 cr			32 054 cr-b)	
General Ledger Balance	$254 820			$227 091	

(a- Includes all utility and rental accounts
(b- Estimated balance

ADMINISTRATIVE PLANNING

A total of 67 new or revised organization and policy guides were distributed during June. Of these, 16 were instruction or policy guides, one was an alphabetical index, and the balance were organization guides. The 16 instruction guides were:

04.8 "Reporting Loss, Destruction or Retirement of Property"
This instruction guide was completely rewritten to more clearly state the directive policy and the necessary procedures for disposing of property.

04.13 "Control of Research and Development Equipment"
This instruction guide is new and was necessary to prevent confusion in the handling of property required for research and development work.

1206871

ADMINISTRATIVE PLANNING (Continued)

08.2 "Telegraphic Messages"
This policy guide was rewritten to eliminate the cumbersome and unnecessary authorization procedure.

10.2 "Records Control"
This instruction was revised principally to bring nomenclature up to date, but the opportunity was taken to combine with it OPG 10.4, "Uniform Filing System."

12.1 "Reporting Inventions and Discoveries"
This instruction was revised to change the name of the individual to whom invention reports must be submitted.

13.8 "Inquiries Relative to Employees"
This policy was revised to bring nomenclature up to date.

13.9 "General Electric Employee Purchase Plan"
Two sections of this instruction were revised to bring them in line with recently changed Company-wide purchase plan provisions.

13.II "Reduction of Force"
This policy was rewritten to give to departments the option of administering that portion of the policy relating to non-bargaining unit employees on a section-wide basis provided that this intention is previously established.

13.16 "Travel Accident or Special Accident Insurance"
This instruction, which implements Company policy regarding this special insurance, was revised to reflect changes in Company policy.

14.10 "Boilers, Unfired Pressure Vessels and Pressure Piping"
This instruction was revised to greatly increase the scope and depth of the controls over pressure vessels.

18.7 "Overtime"
Two paragraphs of this instruction were revised to incorporate a procedural change.

18.11 "Removal from Payroll"
This instruction was revised principally to bring nomenclature up to date, as well as to make some minor procedural changes which had been recommended by the Auditing Section. However, the opportunity was taken to completely rewrite the OPG and eliminate five pages of unnecessary detail.

ADMINISTRATIVE PLANNING (Continued)

18.14.6 "Reactivation of Employees"
This instruction was rewritten principally to more clearly state the directive policy involved and to make minor nomenclature changes.

21.2 "Procurement of Materials"
This instruction was revised to make necessary nomenclature changes, but was also completely rewritten to incorporate within it OPG 21.6, "Emergency Purchases" and also to provide for assigning required authorities to positions as well as to individuals.

21.7 "Contact with Vendors"
This instruction was revised to eliminate all reference to carriers which the former OPG included and which is no longer appropriate.

21.10 "Control of Tools, Jigs and Fixtures for Engineered Equipment or Material"
This policy guide was revised to make two minor procedural changes in one paragraph.

The annual review by departments of their OPG distribution list, as is called for in OPG 01.1, was requested during June. By the end of the month all departments but Employee and Public Relations had made the review and forwarded to Administrative Planning their recommendations.

A new organization and policy guide is being prepared on the subject of collective bargaining to more clearly delineate the various responsibilities in this area.

The organization and policy guide on "Control of Vehicles" (16.1) was rewritten to incorporate revised references to the use of pickups and to revise the references to the use of vehicles assigned to departments for outer-area travel.

Because of the release of the Company's responsibility in North Richland effective July 1, certain OPGs which concern various phases of this responsibility are being revised: for instance 04.4, "Landlord Responsibility," and the functions and responsibility guides in the Community Section.

Two office letters were processed during the month: No. 210, "Certified and Registered Mail" and No. 211, "Independence Day Holiday."

A Company announcement concerning the appointment of W. K. MacCready as Manager of Manufacturing was sent to the Maqua Company for publication.

1206873

ADMINISTRATIVE PLANNING (Continued)

The following organization and policy guides are currently being revised or reviewed for possible revision:

04.1.3	"Research and Development"
04.4	"Assignment of Landlord Responsibilities"
04.5	"Property Management"
13.2	"Membership in Trade & Professional Societies or Associations"
13.5	"Rating Plan - Other than Exempt Employees"
13.6	"Ratings - Exempt Employees"
13.7	"Company Benefits for Employees Entering the Armed Forces"
13.21	"Employee Service Recognition Plan"
17.1	"Policy on Travel, Living, Moving & Entertaining Expense"
18.2	"Absences and Tardiness"
18.14.4	"Induction of New Employees"
18.14.5	"Employee Transfer and Payroll Status Change"
18.14.7	"Policy on Employment of Individuals Relieved from the Armed Forces, U. S. Public Health Service and State of Washington National Guard"
19.2	"Grievance Procedure"
21.8	"Shipping, Receiving & Acceptance Procedures"
23.1	"Control & Accountability of Source & Special Nuclear Materials"
24.1	"Radiation Protection Standards"
24.2	"Responsibility for Radiation Monitoring at Hanford Works"

CONTRACT REIMBURSEMENTS

A draft of subject matter relating to the new prime contract for presentation at information meetings to be scheduled for various levels of management was completed in June. Information included is based on contract draft dated 12-22-54 and will require revision as soon as results of recent contract negotiations are available. This draft incorporates the principal contract changes, a complete analysis of the new contract, including Appendix A, and details of specific risks assumed under the new contract.

Negotiations with Commission representatives were concluded by the subcommittee responsible for bringing Appendix A to the proposed revised prime contract up to date, and the Appendix was reprinted, copies being delivered to the Commission and to HAPO's counsel on June 22.

The Contract Reimbursement group's daily review of newly-issued purchase orders has resulted in calling the attention of the Purchasing Sub-Section to a number of seeming irregularities, most of which involved failure to obtain appropriate AEC approvals.

The subjects of five letters written to the Commission during June in accordance with OPG 05.4 ("Work or Expenditures Which Require AEC Reimbursement Authorization or Letter Approval") included: (1) the two-year technician training program recently announced by the Education and Training Section; (2) the increase from $10 to $25 of the maximum cost of reference material which may be

CONTRACT REIMBURSEMENTS (Continued)

ordered by the Technical Library without the necessity of issuing a purchase order; (3) the authorization for expenditures totaling up to $1,000 for page costs for papers published in scientific and technical journals and the purchase of pamphlets and reprints; (4) the payment of $768 attorneys' fees in collecting a judgment from the State of Washington in connection with the refund of business and occupation taxes; and (5) the payment of General Electric's share ($50) of an arbitration fee in a dispute with the Hanford Guards Union relating to call-in pay for a patrolman.

The Contract Reimbursements group handled 13 inquiries on reimbursement matters during the month, six of which originated outside of the Financial Department.

The May "Summary of Disbursements," which was transmitted to the Commission through the Chief of its Finance Division, covered disbursements of $6,903,175, summarized as follows:

Payrolls and Payroll Deductions Disbursed	$4 288 003
Materials (including payments on requirements contracts) and Freight	2 512 888
Subcontracts and Agreements	90 478
Advances for Traveling and Living Expenses	68 574
Miscellaneous Payments	380 086
Gross Disbursements	$7 340 029
Less: Revenue	436 854
Net Disbursements	$6 903 175

In preparing this report, a review was made of each of 253 items which comprised "Miscellaneous" to establish their propriety, while all other expenditures were analyzed, classified and summarized to disclose the nature of all the disbursements made by HAPO during the month.

Exhibit V ("Disbursements for Freight Costs") on the Monthly Summary of Disbursements was revised, beginning with the June report, to show a more complete breakdown of transportation costs. These costs, which had been listed under four classifications--rail, truck (Transport Clearings only), air express and air freight, and other--now include rail; Motor Transport Clearings; other truck, carloading and forwarding; air express and air freight; and rail express.

A booklet of information intended to be of assistance to section managers of the Financial Department in orienting new employees, which has been in the course of preparation for several weeks, was released this month. It includes tips for interviewing, suggested subjects to be discussed, organization charts (one of which includes photographs of department, section and unit heads), and other appropriate material.

1206875

GENERAL BOOKS UNIT

In connection with the obligation of funds through December 31, 1955, required information was furnished the AEC Budget Division in June and appropriate supplemental agreement to the prime contract was drafted by them. Additional funds totaling $70,611,000; $53,850,000 for HAPO and $16,761,000 for KAPL, were provided, increasing total obligations under the contract to $896,833,000 and $182,584,000 for HAPO and KAPL respectively. An over-all factor for contingencies of approximately $10,000,000 is included in the total funds to be obligated.

Additional meetings were held throughout June with personnel of other units to discuss and co-ordinate action required to meet dates for fiscal year closing entries and reports. The major elements of cost were booked and distributed to cost well in advance of the established closing dates. This time advantage should prove beneficial to all Units in the Financial Department in meeting due dates for reports.

As is normal with year end closings, activity was unusually heavy in the General Books Unit in June. However, all work has progressed on schedule with only 8 hours overtime required. During year-end closings last year, there were 20 employees in the General Books Unit as compared to 17 employees this year, and approximately 100 overtime hours were worked.

The first month's operating experience under the new procedure for processing government cost transfers for materials and services resulted, as anticipated, in substantial savings in time and clerical effort, and a more prompt and even flow of charges to the books. As a result of this simplified procedure, no overtime was required at fiscal year closing, which in itself resulted in a substantial saving when compared to previous years' experience.

An analysis was made of Account 0802 - Continuity of Service Expense Accrued, and it was determined that the over-accrual at December 31, 1954 amounted to $978,355. The over-accrual resulted primarily from the insurance experience refund in the amount of $503,633 and experience credit in the amount of $152,639 for unemployment security payments.

Detailed below is a comparative summary of activity in the continuity of service accrued account:

	1951	1952	1953	1954
Total Expenses	$3 263 480	$3 666 533	$3 940 923	$3 880 011
Continuity-of-Service Accrual	4 546 507	4 486 827	4 801 248	4 858 366
Over-Accrual	$1 283 027	$ 820 294	$ 860 325	$ 978 355
Gross Payroll Costs	$41 444 414	$45 981 165	$49 149 215	$51 178 168
Percent of Expense to Gross Payrolls	7.87%	7.97%	8.02%	7.59%
Percent of Accrual to Gross Payrolls	10.97%	9.76%	9.77%	9.49%

1206876

GENERAL BOOKS UNIT (Continued)

Based on experience for the past four years, an accrual rate of 8% of gross payroll beginning with July, 1955 is recommended.

During June, a total of 555 travel and living and conference expense reports were processed, representing an expenditure of $122,818, which is approximately twice the average monthly total. All but four known items of travel expense incurred in FY-1955 were reported and an accrual was made to cover these. Travel and living expense reports under the revised reimbursement procedure for off-site inspectors were received and processed in June. Auditing these expense reports required approximately twice the time as auditing regular travel reports.

	June	May
Advances from A.E.C.		
Balance at beginning of month	$1 422 504	$1 825 679
Advances received from A.E.C.	6 200 000	6 500 000
Other cash receipts	924 419	436 854
	8 546 923	8 762 533
Less disbursements	6 799 185	7 340 029
Balance at end of month	$1 747 738	$1 422 504
Advances requested for subsequent month	$7 950 000	$6 200 000
Travel and Living Expenses		
Travel Advances to employees		
Balance at beginning of month	$ 74 018	$ 66 829
Advanced to employees	75 665	68 574
	149 683	135 403
Less:		
Travel, living, and conference expenses reported by employees	122 818	53 072
Cash refunded by employees	14 246	8 313
	137 064	61 385
Balance at end of month	$ 12 619	$ 74 018
Outstanding Travel Advances to Employees		
Current	$ 650	$ 66 779
Outstanding over 30 days	11 969	7 239
Total	$ 12 619	$ 74 018
Number of expense reports submitted by employees	555	256

1206877

GENERAL BOOKS UNIT (Continued)

Works Cashier's Office

	June	May
Number of Receipts Issued	11 152	11 585
Bus System Operations		
Cash collections: Village	$ 434	$ 651
Area	$7 354	$7 639
Tickets: Value of tickets sold	$ 400	$ 600
Number of tickets sold	8 000	12 000
Number of tickets collected	9 253	9 443
Cash Overages and (Shortages)		
Number	3	7
Amount	$ .14	$18.87

PERSONNEL ACCOUNTING SECTION
MONTHLY REPORT - JUNE, 1955

Time recorders have been installed in Dormitory W-17 for use by the Inventory Accounting and Plant Accounting Units, and in Dormitory W-21 for use by the Accounts Payable Unit. There are presently 46 time recorders in use in the 300, 700 and 1100 Areas.

Approximately 3,500 letters and applications for participation in the Savings and Stock Bonus Plan were delivered to employees during June in connection with the current bond drive being conducted by the Employee and Public Relations Department. As of June 30, ninety new authorizations have been received for participation in the Plan.

Reimbursement authorization numbers 242 and 245 covering holiday payments and vacation payments for exempt employees, respectively, were approved by the Atomic Energy Commission.

An order for an inserting and mailing machine to be used in inserting payroll checks has been placed by the Office Equipment Unit. Delivery of the machine is expected in approximately 90 days.

Nine annuity certificates issued by the Connecticut General Life Insurance Company were delivered to former du Pont employees who transferred to General Electric Company at Hanford on September 1, 1946. The total number of certificates delivered to date is 124, with a total cost of $398,822, averaging $3,216 each in cost.

Office Letter Number 211 was issued covering the plant closing on Independence Day, and setting forth instructions for completing time cards for shift workers who observed the holiday on a day other than July 4.

Round Table Meetings were held with all non-exempt employees in the Section during the month.

1206879

STATISTICS

Personnel Accounting Section

Number of HAPO Employees	Total	Monthly Payroll	Weekly Payroll
Changes during month			
Employees on payroll at beginning of month	9 201	2 275	6 926
Additions and transfers in	218	23	195
Removals and transfers out	(100)	(18)	(82)
Transfers from weekly to monthly payroll	-	8	(8)
Transfers from monthly to weekly payroll	-	(2)	2
Employees on Payroll at end of month	9 319	2 286	7 033

Overtime Payments During Month	June Number	June Amount	May Number	May Amount
Weekly Paid Employees	6 187	$102 883 -a)	6 301	$104 707 -b)
Monthly Paid Employees	312	20 964	402	31 480
Total	6 499	$123 847	6 703	$136 187

Gross Payroll Paid During Month	June	May
Engineering	$ 762 700	$ 772 757
Manufacturing	2 479 560	2 445 944
Other	1 133 243	1 133 092
Total	$4 375 503 -a)	$4 351 793 -b)

(a- Payments to weekly paid employees are for four week periods.
(b- Payments to weekly paid employees are for four week periods.

Employee Benefit Plans	Number Participating June	Number Participating May	Percent Participation June	Percent Participation May
Participation in Benefit Plans at Month End				
Pension Plan	8 058	8 005	98.5%	98.5%
Insurance Plan				
Personal coverage	9 264	9 145	99.4	99.4
Dependent coverage	6 545	6 463	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 466	4 428	47.9	48.1
Savings Plan	1 083	1 085	11.2	11.8
Both Plans	5 002	4 969	53.7	54.0

1206880

	June	May
Pension Plan		
Number retired	6	2
Number who became eligible for participation	111	53
Number who applied for participation	105	52
Number who elected not to participate	6	1
Replies not received	0	0
Insurance Plan - Number of Claim Payments		
Employee Life Insurance	2	1
Employee accident and health insurance	366	465
Dependent accident and health insurance	517	515
Total	885	981
Good Neighbor Fund		
Number participating	6 564	6 484
Percent of participation	70.4%	70.5%
Suggestion Awards		
Number of awards	92	118
Total amount of awards	$2 105	$1 799
Preferential Rates		
Number (eliminated) or added	(10)	(2)
Number currently in effect	542	552
Number of Military Allowance Payments	3	5

1206881

PROCEDURES AND COMPUTING SECTION
MONTHLY REPORT - JUNE 1955

GENERAL

The IBM Type 702 Electronic Data Processing Machine arrived June 6 and was moved into the new room in the 713 Building. Air conditioning was available on the 8th so machine testing by IBM Customer Engineers could begin. Testing continued through the end of the month.

A report was issued on June 21 outlining a proposed electronic data processing machine application for the Regional Radiation Measurements Unit. The proposed procedure includes the calculation of results and preparation of reports concerning the sampling process. Through the use of a tape preparing typewriter, laboratory findings are to be reported and the data transmitted by punched paper tape to Procedures and Computing for further processing.

PROCEDURAL ANALYSIS

Forms control reviewed 393 orders during June covering 958,080 forms; 15 orders, amounting to 19,010 forms, were rejected; 76 new forms were designed.

A study of the use of special letterheads has revealed that 16 letterheads have been adopted during the last three years. Examples are "Management News Bulletin", "As We See It", "Information - Union Relations", etc. The total annual usage of these letterheads approximates 750,000 sheets, all of which have to be stocked in various duplicating offices. Seven of these letterheads are also carried in Stores. Six are two color printing and ten are printed in colors other than black. Total annual cost of the letterheads is approximately $5,000, plus the cost of printing the message on them. To eliminate the cost of printing and stocking special letterheads, Procedural Analysis is recommending that letterheads be pre-printed on duplimat masters. Letterheads currently being printed in two colors must be re-designed for one color printing, using only black ink. It is recommended that colored paper stock be used where color is required. As current stocks of these letterheads are depleted, users are being requested to make the recommended changes. To date agreements have been reached to change eight of the letterheads to the duplimat system. It is estimated that complete adoption of this new method will result in an annual savings in excess of $4000.

Employee & Public Relations Department

A new procedure has been developed for providing monthly listings of a supervisory directory, based on titles.

Financial Department

A new procedure has been designed to review exempt insurance classifications periodically and produce new exempt insurance deduction cards.

The IBM Type 046 panel wiring and testing for conversion of IBM Type 884 tapes for transcription and up-dating plant accounting history records has been completed. This job, which utilized six of the seven program indications, all available selectors and distributors and all eight reading stations, constitutes a good test of what can be accomplished on this machine.

1206902

Financial Department (continued)

Draft of a typing instructions manual for operation of the IBM Type 884 has been produced and reviewed with Plant Accounting personnel. Typing practice will be carried out on temporary plant record unit history record forms and tapes produced will be processed for review of the operation prior to arrival of the continuous forms next month.

An Industrial Engineer joined the staff during June for the summer months. He has begun work on the following:

1. Development of time standards for keypunch operations. Two hundred feet of the new Tri X film was used to record all regular time and motion elements. The motion pictures will be analyzed in order to aid supervisors in establishing representative time standards for keypunching operations. Further data and films must be developed in the future to cover most of the activities.

2. Methods study and introduction of time standards for the plant library and files. A twenty page outline and introduction has been developed for a series of five two-hour conferences. In addition to basic work simplification concepts, illustrations will be used to show how time standards can be used to evaluate and appraise present and future potential proposals. Informal "on the job" discussions will be a major part of the program.

3. Three conferences have been held with plant Industrial Engineers. Further discussions will be scheduled to discuss common evaluation and performance problems.

Radiological Sciences Department

Work continued on the "Calibrations" procedure with plans to convert to EDPM processing in July or August. Card forms are being re-designed to provide more adequate information.

RECORDS OPERATIONS

Quantity of Records received, processed and stored:

Employee and Public Relations Department	34	Standard Storage Cartons
Engineering Department	100	" " "
Financial Department	170	" " "
Manufacturing Department	91	" " "
Radiological Sciences Department	8	
	403	

Two hundred and sixty-seven cartons of records were destroyed.

1206883

Records Retention and Disposal Schedule Number 214, "Office Equipment and Service Records", consisting of twenty-four individual records; Number 215, "Administration Area Landlord Administrative and Service Records", consisting of thirty-three individual records; and Number 216, "Industrial Fire Unit Records", consisting of fifteen individual records were developed and submitted for internal approval. Records Retention and Disposal Schedules Number 212, "Community Fire Unit Records", consisting of fifteen individual records; Number 213, "Community Police Records", consisting of twenty-nine individual records, and Number 214, "Office Equipment and Services Records", consisting of twenty-four individual records were submitted to the Atomic Energy Commission for approval.

NUMERICAL ANALYSIS

Report is included in Secret Document HW-37658-W.

COMPUTING OPERATIONS

During the month of June the following non-routine assignments were completed for customers:

Atomic Energy Commission	1
Employee and Public Relations	3
Engineering	10
Financial	8
Manufacturing	6
Operations Research	4
Radiological Sciences	4
	36

Service charges for the month amounted to $49,761.75. Services, by customer were as follows:

Atomic Energy Commission	$ 1 041.00	02%
Employee & Public Relations	1 119.74	02
Engineering	9 391.55	19
Financial	33 455.75	67
Manufacturing	1 560.67	03
Operations Research	1 414.51	03
Radiological Sciences	1 778.53	04
	$ 49 761.75	100%

PROPERTY ACCOUNTING SECTION
MONTHLY REPORT - JUNE 1955

PLANT ACCOUNTING UNIT

Relocation of the Plant Accounting offices from the 101 Building in North Richland to Dorm W-17 in the 1100 Area was effected June 18. The unit personnel have evidenced a marked increase in work efficiency and morale as a result of the improvement in working conditions resulting from the move.

An extensive overtime program was initiated during June. Exempt and non-exempt personnel worked a total of nearly 900 hours. The assignments being pursued on this basis include: standardization of nomenclatures and commodity code classification; preparation of detail records resulting from completion of multi-million dollar expansion programs; application of subsidiary coding systems to provide mechanical segregation of plant and equipment by processes or functions; unitization of projects and closings to completed plant accounts; fiscal year closings, consolidations, annual statements and reports; and the unit move from the 101 Building to W-17.

A discussion on revising the spare equipment procedure was conducted with representatives of Manufacturing Cost, Stores, Spare Equipment Mock-Up Shop, and Plant Accounting. M. M. McDonald is drafting a preliminary procedure which will be reviewed by the above representatives for any additions, deletions, or necessary changes. This procedure will conform with the treatment recommended in AEC Controllers Manual and will eliminate some of the paper work now involved in processing this equipment.

A special request for cost and descriptive data of buildings and equipment that could be operated by outside contractors was received by teletype from Washington this month. Facilities involved in this request include office machines, transportation, water systems, sewage disposal systems, and laundries. This information was compiled and submitted to C. E. Cooke of the Measurements Unit who coordinated the activity.

A meeting was held with C. A. Kremer of Community Cost and John Budd of Electrical to establish a procedure for the classification and capitalization of electrical items including transformers, poles, fixtures, electrical meters, and additional material. A method of capitalizing replacement and original installation costs was established and will go into effect July 1, 1955. As a result of this meeting, all electrical meters will be classified as plant and equipment in service and removed from inventory accounts. Much of the labor costs for installation will now be expensed. This procedure conforms with the AEC Controllers Manual and will expedite processing of electrical work orders.

Reconciliation of the Telephone System inventory was completed during the month and a recapitulation of the investment in the plant telephone system was submitted to E. S. Staples of the Telephone Sub-Section.

1206885

PLANT ACCOUNTING UNIT (Continued)

The program of standardizing nomenclatures and establishing commodity code classification for uninstalled equipment is progressing on schedule. During the month coding of office machines, Operation's motor vehicles, heavy equipment and railroad equipment was completed. This activity requires considerable coordination with using units and operators to insure that physical and functional characteristics are properly reflected. Field relations have been excellent in this connection.

A number of inventory programs and transfers to AEC were carried out during the month. They include: inventory of the North Star Theater at North Richland and transfer of the equipment to AEC; inventory and transfer of the equipment in the North Richland Fire Station; and transfer of North Richland community furnishings and equipment.

Improvements to land and other facilities presently maintained by School District #400 in the amount of $783,204 have been analyzed and transferred to AEC. These costs have been carried in the General Electric Plant and Equipment accounts since the plant appraisal in 1949.

Unitization reports distributed in June include:

CA-516	1952 Hanford Expansion - Gable Butte Railroad	$ 71 670
CG-551	Expansion 234-5 Building Facilities	659 291
CA-566	Building for Proto-Type Physical Constants Test Reactor	101 131
CG-573	Hanford 3X Program - 300 Area	843 988
CG-602	Remote Sampling - Hot Semi Works	35 565
Two Miscellaneous Community Projects		6 177

INVENTORY ACCOUNTING UNIT

Final results of the third annual physical inventory of electrical materials in the custody of Electrical Utility Section, Manufacturing Department, reflected a net overage of $457 or 1.46 percent over the book value of $31,377. This compares with an overage of 9.9 percent in May 1954. The primary factor contributing to the overage appeared to be material left over or recovered from completed work orders which was returned to stock. Beginning July 1, 1955 custody of this material will be transferred to Stores.

Final results of the third annual physical inventory of communication supplies in the custody of Auxiliary Operations and Plant Protection Section, Employee and Public Relations Department, reflected a net overage of $1380 or 7.9 percent over the book value of $17,476. This compares to an overage of 35.6 percent in 1954. This overage appeared to result from unrecorded inventory material which was included in our physical inventory.

Control custodians conducted a quarterly physical inventory of special materials as of May 31, 1955. Reconciliation of the individual reports with accounting records disclosed only minor discrepancies which, after investigation, were identified and custodial records corrected.

AEC audit report was received June 30, 1955, covering audit of Reactor and Other Special Materials as of April 30, 1955. Procedures and practices with respect to, and physical controls over special materials were found to be generally satisfactory.

1206086

INVENTORY ACCOUNTING UNIT (Continued)

The third annual physical inventory of excess materials and equipment in the custody of Stores was completed on June 28, 1955. Reconciliation of the physical inventory value with the book value is in progress and the results should be reported during July.

The gold usage report for quarter ended June 30, 1955 is being prepared and will be forwarded to the Manager - Corporate Accounting in Schenectady.

Meetings were held with Transportation personnel this month to formulate procedures, time schedules and manpower requirements for taking the physical inventory of railroad materials. This inventory is scheduled to be taken as of July 31, 1955.

At the request of Transportation Section, Inventory Accounting personnel attended a meeting with Transportation supervision on June 21, 1955. Purpose was to give presentation of inventory philosophy and inventory control requirements.

Several meetings were attended during the month in preparation for handling the year-end closing entries affecting inventory sub-accounts. Inventory reserve requirements have been analyzed and adjustments will be made as required.

Personnel changes during the month included transfer of L. B. Christopher to Inventory Accounting Unit from Auditing Section as of June 1, 1955, and transfer of R. L. Morton from Inventory Accounting to the Auditing Section as of June 30, 1955. One non-exempt employee transferred from Accounts Payable to fill an existing vacancy in the Inventory Accounting Unit.

As of June 18, 1955 the Inventory Accounting Unit moved from offices in North Richland to W-20 Building, 1100 Area.

Following is a summary showing inventory account balances for the months of May and June 1955, together with amount of change.

(In Thousands)	Book Balance 5-31-55	Book Balance 6-30-55	Increase (Decrease)
Current Inventories			
General Supplies	$ 2 184	$ 2 211	$ 27
Fuel and Lubricants	81	90	9
Essential Materials	4 237	4 359	122
	6 502	6 660	158
Special Materials	1 349	1 346	(3)
Spare Parts	4 117	4 184	67
Standby	57	72	15
Excess Materials	260	157	(103)
	12 285	12 419	134

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INVENTORY ACCOUNTING UNIT (Continued)

(In Thousands)	Book Balance 5-31-55	Book Balance 6-30-55	Increase (Decrease)
Less: Inventory Reserves for			
Essential Materials	$ 123	$ 218	$ 95
General Supplies	141	264	123
Spare Parts	732	1 046	314
Standby	12	18	6
Excess Materials	(25)	141	166
Total Inventories - Net	$11 302	$10 732	$(570)
As a Memo: Excess Equipment	$ 508	$ 371	$(137)
Excess Equipment Reserve	(194)	(334)	140

PROPERTY MANAGEMENT UNIT

The AEC is currently the landlord of the majority of the White Bluffs area. With the closeout of construction work, the transfer to GE of buildings to be retained, and the planned disposal of the remaining buildings, the question of landlord functions has been under review. An agreement has been reached that the Engineering Department will assume the landlord functions for the specific buildings to be retained. A further decision will be reached as to what portion of the original White Bluffs area is to be reverted to 600 Area after the sale of the buildings and cleanup by AEC. Water, sewer and electrical distribution facilities required to service the remaining White Bluffs area will be transferred from AEC to GE (Manufacturing Department). These services will be maintained by the Manufacturing Department and the landlord billed accordingly. Similarly, telephone distribution facilities will be transferred to GE (Employee and Public Relations Department) who will maintain these services to the White Bluffs area. Excess electrical and telephone distribution lines and equipment will be disposed of by AEC.

The main Blaw-Knox warehouse in the 200 East Area will be transferred to GE (Manufacturing Department) as of June 30. This building will be used by the Separations Section as a general purpose warehouse (primarily for the storage of essential materials).

During the current month an incident arose where the tenant of an office building occupied in common with other units procured and installed refrigeration-type, individual office air conditioning units to alleviate a temporary condition while concurrently a study was being made by the Engineering Department to correct the air conditioning system of the building. This type of unilateral action by a tenant (which created morale problems for the other tenants) focused attention on (a) the responsibility of a landlord for providing adequate heat and ventilation for the comfort of his tenants; (b) the augmentation of existing heating and ventilation systems by a tenant and (c) the control of refrigeration-type, individual office air conditioning units. Points (a) and (b) were brought to the attention of the manager concerned for review. In regard to point (c), a notice was issued to management stating that refrigeration-type, individual office air conditioning units were classified as office furniture and equipment and would be controlled in accordance with the provisions of OPG 04.5.2, "Management of Special Equipment". Also, that these units were normally classified

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as luxury items and procurement should be discouraged except where an engineering study indicated their installation to be the most economical and permanent solution to an unusual problem.

It has been the tacit understanding that neither the General Electric Company nor the Hanford Operations Office would procure special furnishings of an executive type except for the General Manager - HAPO and the Manager and Deputy Manager - HOO, unless otherwise approved by such executives. Control of executive-type office furniture and equipment is exercised through the Office Equipment Unit in accordance with the provisions of OPG 04.5.2. However, under our direct purchase system, a requisition could come through for a desk set or similar item of executive desk appointments and the item would be procured. After a discussion of this matter with the Purchasing and Stores Section and AEC, a decision was reached that Stores would stock standard, inexpensive, non-executive, GSA Contract items such as pen sets, telephone locator lists, calendar pads, etc., and that any direct purchase requisition would be filled from Stores stock without further processing. It was felt that this would provide the necessary control over the procurement of these sensitive items rather than the promulgation of an OPG on the subject of executive-type furnishings.

OPG 04.10, "Control of Reactor and Other Special Materials", has been revised to provide for the procurement, issue and inventory control of zirconium through the Purchasing and Stores organization. Difficulties were being experienced in controlling this material which was being procured through various channels, moved between vendors, and stock-piled by various units. Under the new procedure all procurement, movement and control of this material in vendor's hands will be channeled through the Purchasing Sub-Section. All inventory stocks will be maintained and accounted for by the Stores Sub-Section. Stocks of zirconium will not be maintained by field activities, only that amount which will be consumed, contaminated or otherwise used within a reasonable period of time (normally ten days). Effective July 1 any inventory stocks of zirconium currently held by field activities will be transferred to Stores and concurrently any material in use, contaminated or changed in grade, purity or form to the extent that it is unfit for normal issue, will be charged off to the activity holding custody of same.

The contaminated equipment warehouse at White Bluffs was discontinued and a work order issued by AEC to cover disposal of the equipment and cleanup of the building. The equipment being held was primarily excess machine tools from the 300 Area and was being held at the Commission's request, pending AEC-wide screening for possible use elsewhere. As all desired items had been withdrawn the Commission authorized the disposal of the residue and the discontinuance of the warehouse.

Seventy-seven requests for the disposition of property were registered, processed and approved during the month. Some of the items handled were:

Disposal of tract house N-1105 at 1019 Lee Boulevard. This house and adjacent garage and shed are to be removed to make the site available for light industrial construction.

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PROPERTY MANAGEMENT UNIT (Continued

Disposal of the basic inspection jigs employed in K Area pile construction. After removal of all instruments the remaining metal parts were disposed of as scrap. Those items of a classified nature were buried.

The autoclaves installed in Building 314, 300 Area, and formerly used in the canning process were removed and disposed of by burial. Also buried from this same building were the burnout furnace and separators formerly used in connection with the melt plant operation. Disposal of these items is part of a general cleanup of this building and its environs.

Plans were developed for the orderly disposal of buildings and equipment included in the 292-B Area.

One pickup truck and five pickup truck bodies were disposed of by burial after repeated attempts to reduce the radiation to levels acceptable for off-site sale had failed. The truck was no longer economical to operate and the truck beds were for older model pickups which had been previously declared excess.

Forty-nine appropriation requests totaling $452,282 were investigated, processed and approved during the month.

APPR ATIONS UNIT

The following Plant and Equipment projects were processed through the Appropriations Unit during June. GE and AEC approval action was as indicated below:

Project Number	Title	Amount of This Request	Total*	Date to AEC	Disposition
CA-512 PRP 3	1952 Hanford Expansion - 100-K Area Facilities	$ 1,000,000	$26,800,000**	6-14-55	Work Authority dated 6-16-55 authorized GE $26,150,000
CA-546 Rev. 3	Fuel Element Pilot Plant	Red. from 2,000,000 to 1,600,000	GE 885,000	6- 2-55	AEC-41, Mod. 6, dated 6-22-55 authorized AEC $1,600,000. Work Authority dated 6-27-55 authorized GE $825,000
CG-558 Phase I Rev. 4	Reactor Plant Modifications for Increased Production	-	26,800,000	3- 3-55	HW-309, Mods. 7 and 8 dated 5-3-55 and 6-22-55, authorized GE $26,800,000.
CG-558 Phase II	Reactor Plant Modifications for Increased Production - 100-F and H Areas	11,200,000	11,200,000	6-27-55	AEC Board Meeting 7-7-55
CG-576 Rev. 4	General Improvements to Laboratory Area Buildings	-	230,000	6-20-55	Approved 6-21-55
CA-601 Rev. 1	General Grounds Improvements - 300 Area	96,000	96,000 GE 22,500	2- 7-55	Approved by AEC, Washington, 5-26-55. To be authorized out of 1956 funds
CG-603 Rev. 1	Hanford 4X Program - Bismuth Phosphate Plants	1,800,000	5,300,000	5- 5-55	HW-338, Mod. 4, dated 6-30-55 authorized GE $5,300,000
CG-604 Rev. 1	Removal of Catwalks from Discharge Areas - 100-B, D, and F Areas	-	32,500	6-20-55	AEC Board Meeting 7-7-55
CA-612 Rev. 2	Alteration of Building 713 for Electronic Data Processing Machine	-	180,000 GE 66,000	6-13-55	Work Authority dated 6-22-55 authorized GE $66,000
CG-613 Rev. 1	Hanford 4X Program - Metal Conversion Plant	2,660,000	3,000,000	3-31-55)	HW-347, Mod. 5, dated 6-30-55 authorized GE $3,000,000
Rev. 2		-	-	4-14-55)	
CG-614 Rev. 1	Hanford 4X Program - 300 Area	210,000	340,000	4-25-55	HW-348, Mod. 2, dated 6-30-55 authorized $340,000

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Proje Number	Title	Amount of This Request		Total*	Date to AEC	Disposition
CG-616 Rev. 1	Installation of Acid Feed Equipment, 100-B, C, D, DR, F, and H	485,000		500,000	5-23-55	HW-349, Mod. 1, dated 6-20-55 authorized GE $185,000
CA-619	Alterations to 186-D Building	32,000	GE	32,000 8,000	3-10-55	Returned unapproved by AEC 6-20-55
CG-621 Rev. 1	Redox Contamination Control Facilities	502,000		550,000	4-15-55	HW-351, Mod. 3, dated 6-30-55, authorized GE $550,000
CG-631	Crib Replacement Facilities - 241-T Tank Farm	146,000		146,000	5-19-55	HW-357, dated 6-17-55, authorized GE $146,000
IR-183	Classified Scrap Disposal - 300 Area	-		8,500	6-20-55	Approved 6-21-55
IR-191	Building 321 - Fire Detection	14,000		14,000	5-10-55	Returned by AEC unapproved 6-9-55
IR-194	Procure and Install a Centralized Quality-Reporting System - 313 Building	15,000		15,000	5-23-55	Approved 6-3-55
IR-196	Surfacing of Roads and Parking Areas - Minor Construction - White Bluffs Headquarters	15,500	GE	15,500 6,200	5-31-55	Approved 6-6-55
IR-197	Water Meter Installation for 300 Area Supply Lines	6,700	GE	6,700 900	6- 2-55	Approved 6-6-55

* Total previous authorizations plus this request
** GE funds only

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SS ACCOUNTABILITY SECTION
MONTHLY REPORT - JUNE, 1955

Liquidation activities associated with Normal Uranium inactive materials have now achieved all economic recovery. Prior accumulations were associated with obsolete processes: tripl dip canning, machining and melt plant operations.

The balance of material on hand averages less than 1% Normal Uranium content: Aluminum-Silicon, brick insulation, sand and gravel, tin and copper contaminated with uranium constitute the principal categories with transportation costs in excess of the value of the material. It is our intention to gather adequate data to support our claims and to request A.E.C. approval to write-off the N. U. content as Measured Discards.

Inactive material generated by the present canning process are liquidated on a current basis. While limited recovery is accomplished locally, the major factor contributing to liquidation is by shipment off-site. National Lead of Ohio and Mallinckrodt, St. Louis, Mo., are the most frequent Receivers.

New forms of SS materials continue to be received by the Metal Preparation Area. Four types are of sufficient importance to warrant identification as follows:

1. "Blind Hole" Uranium - Cored - Drilled Slugs (Open at one end only).

2. Solid 4" Uranium Powder Metallurgy Slugs (Higher density than previous receipts).

3. Arc welded Process Thorium Slugs 6" (Heavier than previous receipts).

4. Enriched Uranium - Thorium alloy metal.

Item #4 presents a comparatively new problem in quantitative control in that two separate material categories are involved in the single physical piece. This is not new in the sense of a first occurrence, but it is new in that the frequency of such problems appears to be a current field of activity. Heretofore such cases were limited to Technical Section activities particularly, the Special Irradiation program and as such, presented isolated cases.

Operation of the prototype Constants Test Reactor is expected during July. Our information indicates that initial loading will be with synthetic high exposure slugs fabricated from Depleted Uranium alloyed with plutonium. This is a second case of the dual material type problem and it is expected that numerous control problems will develop. Close relations with custodians are being maintained. Full cooperation has been received.

Our control accounts for SS materials held by the Separations Technology Section have been extensively revised. These changes were due to the reorganization of the Separations Technology Section. Control account function now parallels the custodian organization and is now in the form indicated by prior experience to be most efficient.

For purposes of recording the records maintained by the Metal Preparation Area - SS Accountability Unit we are providing the following tabulation:

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Manufacturing (Normal Uranium - Solid
Metal Prep. (" " "
" (Normal Uranium - Cored
" (Normal Uranium - Extruded
Pile & Sep. Tech. - Normal Uranium - all types

Manufacturing & (Enriched U - More than 75%
Engineering (Enriched U - Less than 75%
Plant Wide (Thorium
" " (U-233

Pile Technology - Depleted Uranium - (Irradiated & Non Irrad.)
Sep. Technology - Depleted Uranium - (Irradiated & Non Irrad.)
Pile & Sep. Technology - Plutonium

N.B. (Tritium is maintained on Accounting Schedule Basis only due to the status of the program).

The Reactor Area - SS Accountability Unit assumed full responsibility for the maintenance of double entry accountability records covering material transactions of the 100 Areas, as of July 1, 1955. Concurrent with this change, negotiations were successfully conducted relative to the procedures governing the flow of source data to the Accountability Unit. Full cooperation of the Pile Technology Section contributed to the smooth transition.

Further evidence of the cooperative activities between the Mfg. - Reactor Area Operations and the Reactor Area - SS Accountability Unit resulted in the development of an alternate procedure controlling Pile Basin inventories. The revised procedure represents a saving of ten man hours per month. Under the agreed to procedure inventory data was provided as of June 30, 1955 and thereafter the quantity of metal left from each discharge as: (1) Material to be transferred to Pile Technology; (2) Material in heel buckets; and (3) Material in full buckets not yet assigned key numbers.

Training of Reactor Area - SS Accountability Unit personnel continues. Three information meetings were held during the month.

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Production activities in the Separations Areas were primarily influenced by scheduled programs.

Redox operation was curtailed a nominal ten days preceding start-up on high material.

TBP operation was marked by high levels of recycle.

Recuplex continued on cold runs. No plutonium processing is scheduled prior to July.

Metal Fabrication continues the current production drive.

An appreciable reduction in work load has been accomplished with the elimination of charge by charge dissolver accounting in Redox. Satisfactory control of the plutonium isotope correction factor is provided by measurements and is no longer associated with metal history. Similar work reduction activities are under consideration at Metal Fabrication where direct entry by the operators for source data will simultaneously comply with Run Book and source data requirements.

SS ACCOUNTABILITY SECTION-
MONTHLY REPORT- June, 1955

Preliminary material balance areas for Purex have been forwarded to Operations and are currently under review by interested parties.

Adequate security controls were maintained under improved procedures involving the use of the continuous pagination system. This is a constant problem due to the fact most of the records contain classified information and require security control.

Material Underaccounted For problems are indicated by the records relative to Task I. This is a recurrence of difficulties at this process step. Previous discrepancies were due to difficulties in the measurement of the supernatant. At the present time, however, preliminary evidence indicates the transfers from Redox may be the controlling factor. Investigation continues but has not as yet isolated the assignable reason for the MUF.

A Standard physical inventory form for use in A.E.C. Surveys has been devised to replace the numerous forms previously in use. This form is in current use for Part 3 of A.E.C. Survey #12.

The SS Accountability Unit completed its review of the transfer problem associated with the assumption of Normal Uranium responsibilities by the SS Reactor Area Unit. This is an internal problem involving accounting procedures, flow of source data and liaison relations with custodians. Conclusions favor the move on the basis of improved control, more favorable time factors and in the reduction of contacts required.

The May Monthly Material Balance Report included the revised Recapitulation Flow Chart. Significant changes included additions of Task I flows, Recuplex and the addition of month-end inventory data. Purex operation was anticipated and provisions made for its inclusion.

SS Measurements Unit activities include the following:

1. Bismuth Phosphate Measurement and Inventory Verification Manual - Document HW-36218 has been prepared and will be released as soon as proof reading and editing have been completed.

2. The influence of transfers of unmeasurable quantities of SS materials during the process operation of back-flushing of filters in the Redox process - 233-S has been reviewed and a recommendation made that the separate material balance areas currently maintained be consolidated.

3. SS inventories for Silica gel and discards at Redox were reviewed and found to be of minor importance.

4. Sampling error at L-16 - Redox has been reviewed. Document HW-37717 contains the recommendations which include modification of the Sampler and for procedural changes.

5. The Sampling Frequency Study resulted in a series of recommendations as follows:

   TBP Hot Waste

   We recommended a 50% reduction in sample frequency. This was rejected by Operations but only after clarification as an operational control. Previously the sample frequency was designated as "Required by Accountability".

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A 50% reduction in TBP and Feed samples has resulted from our recommendation. In addition, the TBP-UO_3 condensate waste samples are being composited with one analysis run on weekly frequency.

Redox Scrubber Wastes

These wastes were found to be insignificant and the measurement frequency was reduced to one per month. The sump and condensate wastes were placed on direct analysis. Reduction of sample frequency is dependent on Radiological Sciences review. No results are currently available.

Bismuth Phosphate

Am-Cm measurements on low MWD/T material have been eliminated.

Shipper-Receiver Variance

Shipper-Receiver Variance problems associated with UO_3 shipping data have been satisfactorily resolved. Action taken by the SS Measurements Unit was acceptable to Operations and has corrected the weight inaccuracies in our shipping claims.

Gross sampling error was discovered in the L-6 tank (Redox plutonium product). This agrees with the separate findings of Task I - MUF observations. Corrective action is currently in progress.

Investigations of the measurement problems associated with the potential shipment of UNH from Purex storage to UO_3 plant were conducted and a report issued including recommendations for measurement control.

C. J. Shortess, Jr., attended the USAEC-Division of Source and Special Nuclear Materials Statistical Meeting, held in Washington, D.C., June 17 through 22, 1955.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION

JUNE, 1955

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning of month	470	457
Additions and transfers in	21	18
Removals and transfers out	(9)	(5)
Employees at end of month	482	470
Personnel by Components at Month-End		
General	10	10
Auditing Section	15	14
Budgets and Measurements Section	10	8
Contract Cost Section		
General and Consolidations Cost Unit	11	10
Engineering Cost Unit		
General	5	5
Design Cost	7	7
Project Cost	18	17
Technology Cost	10	12
Employee and Public Relations Cost Unit		
General	2	2
Plant Activities Cost	10	8
Community Cost	4	4
Medical Cost	3	3
Manufacturing Cost Unit		
General	2	2
Financial Representatives	13	11
Budgets and Control	14	17
Reports and Records	15	16
Product Costs	4	4
	118	118
General Accounting Section		
Accounts Payable Unit	23	22
Accounts Receivable Unit	21	21
General Books Unit	15	18
Administrative Planning	3	3
Contract Reimbursements	5	5
	67	69

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	Current Month	Prior Month
Personnel Accounting Section		
Payroll Planning and Analysis Unit	7	7
Weekly Payroll Unit	18	17
Monthly Payroll Unit	11	12
Benefit Plans Accounting Unit	13	13
Payroll Reports Unit	7	7
Weekly Payroll Records Unit	8	8
	64	64
Procedures and Computing Section		
Computing Operations Unit	22	21
Numerical Analysis Unit	10	8
Procedural Analysis Unit	22	21
Scheduling Unit	23	21
Records Operations Unit	8	8
	85	79
Property Accounting Section		
Appropriations Unit	5	5
Inventory Accounting Unit	12	11
Plant Accounting Unit	42	43
Property Management	4	4
	63	63
SS Accountability Section		
Reactor Area - SS Accountability Unit	5	5
Separations Area - SS Accountability Unit	16	16
Metal Preparation Area - SS Accountability Unit	8	8
SS Accounting Unit	6	6
SS Measurements Unit	10	10
	45	45
Rotational Trainees	5	0
	482	470

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Date Oct 27, 1951

[redacted]

PROCEDURES & COMPUTING SECTION
MONTHLY REPORT - JUNE 1955

GENERAL

The IBM Type 702 Electronic Data Processing Machine arrived June 6 and was moved into the new room in the 713 Building. Air conditioning was available on the 8th so machine testing by IBM Customer Engineers could begin. Testing continued through the end of the month.

A report was issued on June 21 outlining a proposed electronic data processing machine application for the Regional Radiation Measurements Unit. The proposed procedure includes the calculation of results and preparation of reports concerning the sampling process. Through the use of a tape preparing typewriter, laboratory findings are to be reported and the data transmitted by punched paper tape to Procedures and Computing for further processing.

PROCEDURAL ANALYSIS

Forms control reviewed 393 orders during June covering 958,080 forms; 15 orders, amounting to 19,010 forms, were rejected; 76 new forms were designed.

A study of the use of special letterheads has revealed that 16 letterheads have been adopted during the last three years. Examples are "Management News Bulletin", "As We See It", "Information - Union Relations", etc. The total annual usage of these letterheads approximates 750,000 sheets, all of which have to be stocked in various duplicating offices. Seven of these letterheads are also carried in Stores. Six are two color printing and ten are printed in colors other than black. Total annual cost of the letterheads is approximately $5,000, plus the cost of printing the message on them. To eliminate the cost of printing and stocking special letterheads, Procedural Analysis is recommending that letterheads be pre-printed on duplimat masters. Letterheads currently being printed in two colors must be re-designed for one color printing, using only black ink. It is recommended that colored paper stock be used where color is required. As current stock of these letterheads are depleted, users are being requested to make the recommended changes. To date agreements have been reached to change eight of the letterheads to the duplimat system. It is estimated that complete adoption of this new method will result in an annual savings in excess of $4000.

Employee & Public Relations Department

A new procedure has been developed for providing monthly listings of a supervisory directory, based on titles.

Financial Department

A new procedure has been designed to review exempt insurance classifications periodically and produce new exempt insurance deduction cards.

The IBM Type 046 panel wiring and testing for conversion of IBM Type 884 tapes for transcription and up-dating plant accounting history records has been completed. This job, which utilized six of the seven program indications, all available selectors

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Financial Department (continued)

and distributors and all eight reading stations, constitutes a good test of what can be accomplished on this machine.

Draft of a typing instructions manual for operation of the IBM Type 88[illegible] has been produced and reviewed with Plant Accounting personnel. Typing practice will be carried out on temporary plant record unit history record forms and tapes produced will be processed for review of the operation prior to arrival of the continuous forms next month.

An Industrial Engineer joined the staff during June for the summer months. He has begun work on the following:

1. Development of time standards for keypunch operations. Two hundred feet of the new Tri X film was used to record all regular time and motion elements. The motion pictures will be analyzed in order to aid supervisors in establishing representative time standards for keypunching operations. Further data and films must be developed in the future to cover most of the activities.

2. Methods study and introduction of time standards for the plant library and files. A twenty page outline and introduction has been developed for a series of five two-hour conferences. In addition to basic work simplification concepts, illustrations will be used to show how time standards can be used to evaluate and appraise present and future potential proposals. Informal "on the job" discussions will be a major part of the program.

3. Three conferences have been held with plant Industrial Engineers. Further discussions will be scheduled to discuss common evaluation and performance problems.

Radiological Sciences Department

Work continued on the "Calibrations" procedure with plans to convert to EDPM processing in July or August. Card forms are being re-designed to provide more adequate information.

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RECORDS OPERATIONS

Quantity of Records received, processed and stored:

Employee and Public Relations Department	34	Standard	Storage	Cartons
Engineering Department	100	"	"	"
Financial Department	170	"	"	"
Manufacturing Department	91	"	"	"
Radiological Sciences Department	8	"	"	"
	403			

Two hundred and sixty-seven cartons of [redacted]re destroyed.

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Records Retention and Disposal Schedule Number 214, "Office Equipment and Service Records", consisting of twenty-four individual records; Number 215, "Administration Area Landlord Administrative and Service Records", consisting of thirty-three individual records; and Number 216, "Industrial Fire Unit Records", consisting of fifteen individual records were developed and submitted for internal approval. Records Retention and Disposal Schedules Number 212, "Community Fire Unit Records", consisting of fifteen individual records; Number 213, "Community Police Records", consisting of twenty-nine individual records, and Number 214, "Office Equipment and Services Records", consisting of twenty-four individual records were submitted to the Atomic Energy Commission for approval.

NUMERICAL ANALYSIS

Flow charts for the preparation of trip-before-instability limits and panellit gage base reports on the 702 have been designed. The procedure is arranged so that either type report may be prepared independently, thus lending itself readily to emergency requests. Input data to the system consists of panellit maps, base change lists, and a master panellit record for all areas which is retained on magnetic tape. The type of reports to be prepared is presently being negotiated. The procedure is sufficiently flexible that it may form the basis of a more comprehensive reactor data processing system.

A total of 44 temperature tapes have been received from the KE reactor experiment to date. On the basis of the initial plans, the experiment is approximately 33% complete.

Tube factors for DR reactor were computed for the Production Planning and Scheduling Unit. End-of-month in-pile inventories were calculated from Production Planning and Scheduling data for all reactors for the months of April and May. The requested information was furnished to SS Accountability and the reactor physicists.

As a first step in converting the processing of meteorological data from punched-card equipment to the 702, a program has been written for transcribing all existing punched-card records of weather data into magnetic tape. Standard record formats for these data were developed earlier during the investigation of the stack gas dilution problem. One reel of magnetic tape will hold approximately one year's data.

Corrections to neutron flux measurements along the vertical axis of a cubical pile are being calculated for the Exponential Physics Unit. These corrections include both harmonic corrections and end-corrections, and are being calculated for a number of different lattice conditions. The calculations will be carried out on the 702 making full use of the floating-decimal subroutine developed earlier.

An additional 9 x 9 and a 6 x 6 system of linear algebraic equations were solved on the card-programmed calculator for the Exponential Physics Unit.

A request was received to extent the calculations relative to the thermal utilization and resonance escape probability of a hollow slug. Using results obtained for the two cases of effective cell diameters most recently studied, the Fermi age and effective multiplication factor of some 100 cel[redacted]be calculated. Programming for the 702

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NUMERICAL ANALYSIS (continued)

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has been completed. This application is novel in that output data from the card-programmed-calculator will be used directly as input data to the 702. The conversion from the old floating-decimal form to the floating-decimal form used in the 702 subroutines was incorporated in the program.

An additional 300 sets of 3 x 3 simultaneous equations were solved in connection with a fuel element development study. In addition to the solutions, sums and sums of squares and frequency distributions over certain classes of data were obtained.

Further testing of the Production Scheduling calculation is being carried out. A fifth order system was tested on the HAPO 702 and corrections to the program made. A seventeenth order system is presently being tested.

A manual on the use of floating-decimal sub-operations and a detailed description of all floating-decimal subroutines has been distributed to all programmers and analysts. The floating-decimal sub-operations were used in coding two logically complex problems, each requiring approximately two man-days programming time. There are strong indications that considerable saving in programming time will be realized through the use of these sub-operations. A program for testing the subroutines was also written.

Satisfactory approximations to the Bessel functions J_0, J_1, I_0, I_1, have been obtained, using Chebyshev polynomials. Approximations to the corresponding asymptotic expansions are presently being obtained. The entire group of functions will be incorporated into the library of floating-decimal sub-operations. A floating-decimal subroutine for the error function was written.

The development of a number of standard computational techniques is being undertaken. Programs are being written for solving systems of linear algebraic equations of orders up to 30, for calculating the sums, sums of squares, sums of cross products, variance and co-variances of up to 1000 observations of 35 variables, for preparing chi-squared (contingency) tables for arrays up to order 6, and for calculating the coefficients in a fifth-order polynomial by means of least squares. These programs will be used to fill requests for some of the more frequent types of computation.

COMPUTING OPERATIONS

During the month of June the following non-routine assignments were completed for customers:

Atomic Energy Commission	1
Employee and Public Relations	3
Engineering	10
Financial	8
Manufacturing	6
Operations Research	4
Radiological Sciences	4
	36

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COMPUTING OPERATIONS (continued)

Service charges for the month amounted to $49,761.75. Services, by customer, were as follows:

Atomic Energy Commission	$ 1 041.00	02%
Employee & Public Relations	1 119.74	02
Engineering	9 391.55	19
Financial	33 455.75	67
Manufacturing	1 560.67	03
Operations Research	1 414.51	03
Radiological Sciences	1 778.53	04
	$ 49 761.75	100%

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OPERATIONS RESEARCH STUDY

MONTHLY REPORT
JUNE, 1955

The following is the month end summary of personnel:

	As of 5-31-55			As of 6-30-55			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	1	1	2	1	1	2	0	0	0
Operations Research Analysts	5	0	5	5	0	5	0	0	0
TOTAL	6	1	7	6	1	7	0	0	0

Mr. P. M. Thompson visited the RAND Corporation of Santa Monica, California on the use of the RAND Corporation large scale computing equipment and for discussions relative to the influence of recent computer developments on linear programming computation formulation.

Mr. L. W. Smith, Jr. visited in the east during the month of June. Mr. Smith consulted with members of the General Electric Company's Management Consultation Services Division in New York City and in Somersworth, New Hampshire; visited Massachusetts Institute of Technology with regard to their digital computer laboratory and their operations research group; gave an invited paper at the Operations Research Society of America meeting held in New York City on June 3 and 4; visited with the Consulting Engineer-Statistical Methods at the General Engineering Laboratory in Schenectady; acted as an invited participate of the Linear Programming Panel at the 3rd Conference of Business Statistics, sponsored by the University of Pennsylvania and the American Statistical Association; visited Carnegie Institute of Technology with regard to operations research and consulted with members of the Operations Analysis office of the Atomic Energy Commission in Washington, D. C.

Production Planning

An important current problem of the Atomic Energy Commission nationally is the supply of uranium. One means of easing this national problem is to reduce uranium inventories at operating plants. The Operations Research Study at Hanford as an outgrowth of operations research on production planning has found in preliminary investigations that significant reductions in uranium metal hold-up during processing can be achieved by slight delays in plutonium separations. Some general principles by which such reductions can be achieved have become apparent. Operations research on this problem is continuing.

On the basis of recent visits of Hanford Operations Research Study personnel to various organizations and individuals, it can be said that our production planning operations research is recognized as the most advanced application of dynamic

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linear programming in the planning field. This has only been achieved by extensive research in the three basic areas of mathematics, model building and computation. This investigation is continuing. New mathematical methods are being investigated which are more powerful than linear programming, since they treat continuous approximations with the calculus rather than discrete approximations with algebra. Computational development has been marked by the first primal solution of a linear programming system on the 702 Electronic Data Processing Machine. Since this is the first such application of this machine, it has also aroused national interest.

Data Processing

The data processing operations research program was established to determine the extent to which the new 702 Electronic Data Processing Machine can be used to expedite the analysis and distribution of information at all levels of management. Work to date has indicated a tendency to limit the application of the new machine to existing systems. The maximum benefits can be obtained only if all levels of management are made aware of the full capabilities of the machine, which are far beyond, and logically different from, those of the present equipment.

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