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MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

OCTOBER 1954

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Classification Cancelled (Change to) By Authority of C6-PR-2
DS Lewis 5/21/92
DG Michaels 6/2/92
PRM Eck 6-3-92

Compiled By
DEPARTMENT MANAGERS

CLASSIFICATION REVIEW FOR DECLASSIFICATION BUT LEFT UNCHANGED
By M E Ney
Date 6-3-77

November 24, 1954

RICHLAND, WASHINGTON

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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

OCTOBER 1954

GENERAL SUMMARY

PRODUCTION OPERATIONS

The net production of acceptable slugs was 415 tons which established a new production record. The high monthly production, which was 111 percent of the official forecast, resulted from improved yields and efficiency and the reduction of inprocess canned inventory.

The total monthly input plutonium production was 109 percent of the forecast. The higher-than-forecasted plutonium production was due to the postponement of a one week outage at C reactor for rear pigtail replacement and slightly higher-than-forecast operated efficiencies.

The rupture of slugs during the month was numerically the most severe in Hanford history. A total of 23 eight-inch uranium ruptures in 17 tubes occurred at H, five "J" metal ruptures at DR, and one eight-inch production test slug at D Reactor. Slug ruptures at H Pile occurred in seventeen tubes in an area 10 rows high and 11 rows wide. A localized hot spot of short duration during a rapid startup possibly caused the high incidence of ruptures.

The Redox monthly production from high concentration material was 123 percent of the forecast, while the T plant production from low concentration material was 108 percent.

ENGINEERING TECHNOLOGY

Two tubes of cored uranium slugs under test at C Pile have now reached 375-400 MWD/T. Plans are under way to charge four tubes of extruded cored slugs at C Pile.

Scavenging of the Waste Metal Recovery Plant aqueous waste stream with nickel ferrocyanide, inaugurated last month, has allowed the routine cribbing of over 25,000 gallons of waste volume for each ton of new uranium processed. A flowsheet has been prepared for treatment of wastes stored previous to the start of scavenging.

The fission product activity retention in used TBP Process solvent appears to be caused by reaction products of the diluent rather than by degradation products of tributyl phosphate as has been previously supposed. The implications in regard to specifications for hydrocarbon diluent and possible advantages of a carbon tetrachloride diluent are significant.

PERSONNEL AND SERVICES

An Operations Research Study was established by the General Manager effective October 15, 1954, to continue until December 31, 1955. Initial emphasis has been placed on obtaining a mathematical model of Hanford production operations which adequately represents the true physical conditions and can be used for production forecasting, planning and scheduling. By means of the mathematical model, the computation of many plans based on various assumptions can be obtained readily, and each plan obtained will be optimum within the restrictions imposed.

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6	A. B. Greninger
7 - 8	Atomic Energy Commission Hanford Operations Office Attention: D. F. Shaw, Manager
9	Atomic Energy Commission Hanford Operations Office Attention: J. J. Joyce
10	Atomic Energy Commission For: B. M. Fry, AEC, Washington
11	700 File
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[redacted]

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 . . . . . C. N. Gross

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
OCTOBER 31, 1954

	EXEMPT		OTHER		TOTAL	
	10-31-54	9-30-54-a)	10-31-54	9-30-54-a)	10-31-54	9-30-54-a)
Counsel	3	3	2	2	5	5
Operations Research Study	6	6	1	1	7	7
Special Study	4	3	2	2	6	5
Employee & Public Rel.						
General	8	6	1	1	9	7
Salary & Wage Adm.	11	10	12	11	23	21
Personnel Practices	14	13	37	37	51	50
Education & Training	7	7	47	50	54	57
Emp. Comm. & Pub. Rel.	9	8	38	42	47	50
Union Relations	5	5	2	2	7	7
Aux. Oper. & Plant Prot.	121	124	812	803	933	927
Community	129	131	283	283	412	414
Health & Safety	55	56	202	202	257	258
Engineering Department						
Advance Engineering	10	10	1	1	11	11
Technical	413	411	241	241	654	652
Design	179	176	123	121	302	297
Project	249	254	155	159	404	413
Engineering Adm.	25	25	87	85	112	110
Manufacturing Department						
General	15	15	6	6	21	21
Reactor	284	282	1 251	1 217	1 535	1 499
Separations	282	287	1 338	1 326	1 620	1 613
Metal Preparation	102	99	510	501	612	600
Transportation	42	42	448	449	490	491
Purchasing & Stores	55	56	225	228	280	284
Electrical Utility	16	16	74	73	90	89
Financial Department						
General	6	6	6	6	12	12
Costs & Budgets	27	27	97	97	124	124
Gen. & Personnel Acc.	17	17	122	122	139	139
Property Accounting	16	16	43	42	59	58
Audits & Procedures	22	22	4	4	26	26
S. F. Accountability	6	6	20	21	26	27
Procedures & Computing	26	25	54	55	80	80
Radiological Sciences Department						
Records & Standards	25	25	147	140	172	165
Biophysics	56	56	68	63	124	119
Biology	34	34	35	38	69	72
Engineering	6	6	1	1	7	7
Adm. & Communications	4	4	5	4	9	8
Grand Total	2 289	2 289	6 500	6 436	8 789	8 725

(a- Recast to reflect dissolution of the Plant Auxiliary Operations Department effective 10-15-54.

AREA PERSONNEL DISTRIBUTION
OCTOBER 31, 1954

	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	27	68	-	14	43	-	67	62	277	318	876
Other	15	30	2	58	11	-	21	30	223	217	607
Total	42	98	2	72	54	-	88	92	500	535	1 483
Manufacturing Department											
Exempt	67	59	64	74	20	-	29	260	102	121	796
Other	292	318	296	214	148	-	199	1 175	513	697	3 852
Total	359	377	360	288	168	-	228	1 435	615	818	4 648
Financial Department											
Exempt	-	-	-	1	-	-	1	2	5	111	120
Other	-	-	1	2	2	-	-	1	17	323	346
Total	-	-	1	3	2	-	1	3	22	434	466
Employee & Public Relations											
Exempt	22	8	7	7	7	-	4	16	13	229	313
Other	58	48	86	49	72	11	32	116	114	894	1 480
Total	80	56	93	56	79	11	36	132	127	1 123	1 793
Radiological Sciences											
Exempt	2	-	35	-	-	-	2	18	56	12	125
Other	6	-	38	-	-	-	7	16	171	18	256
Total	8	-	73	-	-	-	9	34	227	30	381
General											
Exempt	-	-	-	-	-	-	-	-	-	13	13
Other	-	-	-	-	-	-	-	-	-	5	5
Total	-	-	-	-	-	-	-	-	-	18	18
Total Exempt	118	135	106	96	70	-	103	358	453	804	2 243
Total Other	371	396	423	323	233	11	259	1 338	1 038	2 154	6 546
GRAND TOTAL	489	531	529	419	303	11	362	1 696	1 491	2 958	8 789

MANUFACTURING DEPARTMENT

OCTOBER 1954

METAL PREPARATION SECTION

The net production of acceptable slugs was 415 tons which established a new production record. The high monthly production, which was 111 percent of the official forecast, resulted from improved yields and efficiency and the reduction of inprocess canned inventory. A canning yield of 83 percent was realized which was 7 percent above that of the previous month. The yield improvement was principally due to an outgassing process developed to release hydrogen from the surface of the slug and thus reduce porosity difficulties experienced in September. Continued emphasis on careful handling of slugs at the facing operation contributed to an improvement in the marred surface reject category.

During the month there was one autoclave failure of an eight inch normal uranium slug caused by penetration resulting from a defective can.

Eight new autoclaves were placed in service in 313 Building during the month.

The improvement in bare slug surface quality continued during the month. The bare slug reject rate dropped to 3.4% for October as compared to four percent in September.

REACTOR SECTION

The total monthly input plutonium production was 109 percent of the forecast. The higher-than-forecasted plutonium production was due to the postponement of a one week outage at C Reactor for rear pigtail replacement and slightly higher-than-forecast operated efficiencies.

The reactor time operated efficiency was 82 percent for the month as compared to 91.6 percent for September. The lower efficiency was due to an abnormally high amount of scheduled outage time, a high number of slug failures, and extensive process tube leak testing outage time.

The maximum established reactor power levels were increased a total of 90 MW, 75 at F Reactor and 15 at the B Reactor. The gain was due primarily to an increase in permissible outlet water temperature limit.

The present reactor goal concentration is the base plus 125 MWD/ton except at D Reactor where a pilot concentration program of base goal plus 225 MWD/ton is in progress, and at C where the low concentration program of one third base goal is in effect.

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REACTOR SECTION (Continued)

The rupture of slugs during the month was numerically the most severe in Hanford history. A total of 23 eight-inch uranium ruptures in 17 tubes occurred at H, five "J" metal ruptures at DR, and one eight-inch production test slug at D Reactor. The total reactor outage time required for removals of ruptures during the month was 258.4 hours.

The plutonium output production was 11 percent above forecast, primarily as a result of above forecast input production during the past several months and the program of incremental increases in goal concentrations. The tonnages of low and other concentration materials discharged were 268 and 97 tons respectively, representing 97 and 127 percent of forecast.

The high incidence of ruptures at H Reactor, all occurring in 17 tubes within a block of approximately 100 tubes immediately above the near side center of the reactor, has been attributed to high temperatures and frequent wide-range heat cycling, based upon a tendency of the loading pattern in this location to overheat during start-ups, and on evidence that on one occasion during a start-up, tube temperatures in this block were above process limits for one or two minutes. To minimize the opportunity for further ruptures in this zone from this cause, approximately 40 tubes were discharged. In addition, the loading pattern in this region is being studied with the objective of eliminating the causes for this condition.

During October, 23 reactor scrams occurred. Of these, 16 at C, DR, F, and H Reactors were caused by normal Panellit system variables. One scram at D Reactor resulted from an electrical failure in the circuit supplying the Ball 3X - No. 2 safety circuit intertie when the horizontal rod gate circuit was grounded by causes unknown. One scram at DR Reactor occurred during a start-up as the result of a high level Beckman trip, which also caused a scram at D Reactor through the inter-tie circuit. Two Beckman scrams occurred at F Reactor, the first as the result of an unintentional by-passing of three Beckmans and the other as the result of suspected induced transient pulses in the present wiring. One scram at DR Reactor resulted when an oil line on the No. 2 horizontal rod shim pump broke. One scram at H Reactor resulted from a momentary unexplained low flow on Production Test recirculation tube 0961-H. Total outage time resulting from these scrams was 37.0 hours.

Process tube leak testing was done at B, C, DR, and H Reactors. At B Reactor, approximately 100 tubes were tested prior to locating a leaking Van Stone flange. At C Reactor, approximately 750 tubes and all horizontal rods were tested. One minor nozzle leak was found, and nozzles on approximately 530 tubes were tightened. When water collection rates at C continued to increase, approximately 560 additional tubes were tested during a scheduled outage with one leaking tube being found and replaced. At DR Reactor, approximately 700 rear tube nozzles were tightened. At H Reactor, a September leak testing outage continued into October. A total of 864 tubes were tested and nozzles on 1150 tubes were tightened without finding a leak. When collection rates continued high, 151 additional tubes were tested with no leaks found. At month end, all collection rates are normal. Leak testing programs involved approximately 125 hours of outage time during October.

REACTOR SECTION (Continued)

Horizontal rod performance in October was less satisfactory than in recent months. At DR Reactor, rod thimbles 2, 5, 7, and 8 were found to be leaking. At F Reactor, rod 4 was found to be binding due to track buckling, with thimble rupture suspected. At B Reactor, rod A was found to be leaking and was replaced. At H Reactor, rods 9 and 14 and their thimbles were found to leak. Rod repairs included rod and thimble 7 replacement at D Reactor, and thimble A replacement at B Reactor. In addition, at C Reactor rods 3 and 4 were cleaned internally using a 10 per cent chromic acid solution with resulting gains in rod exit water pressure of approximately five pounds.

The tritium and U-233 production programs continued throughout the month with input productions of 103 and 101.5 per cent of forecast respectively.

The shipment of J slugs continued at the scheduled rate during October.

SEPARATIONS SECTION

The Redox monthly production from high concentration material was 123 per cent of the forecast, while the T plant production from low concentration material was 108 per cent.

A production rate of approximately 6 tons per day was maintained in the Redox plant for the first five days of the month. On October 5, the plant was shut down to complete the second ruthenium scrubber (J-2) jet out installation and to replace the D-13 waste receiver tank. Operations were resumed on October 9 and a 7-ton per day rate was maintained until October 21 when a shutdown was effected to replace the waste neutralizer and centrifuge feed tank agitators which had failed. Operations were resumed on October 24 and a 7-ton per day rate was held the remainder of the month. Delays in the startups of both shutdowns were experienced due to difficulties with the 60-ton crane. Processing troubles at head end and a drop-off in the first extraction cycle feed pump capacity prevented the plant from achieving the 8-ton rate. The facility total downtime for the month was 193 hours. Efforts continued throughout the month to improve the decontamination factor of the final uranium product. However, only 20 per cent of the entire month's uranium production was within specifications.

Although minor mechanical and operating difficulties were experienced during the month, T Plant production forecasts were exceeded and three new records were established on total metal dissolved, total runs shipped, and total runs started.

On a test basis the first cycle waste was being scavenged at month end.

The TBP facility production was 121 per cent of the official forecast. The production for the month was forecast low due to the expectancy of preliminary work on series conversion and insufficient tank farm inventory of aged material. The lines operated only 48 percent of the month with the A Line being down for series conversion most of the period. Production was adversely affected by a series of pump failures at the 241-WR waste storage vault. All wastes from the facility were scavenged during the month.

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SEPARATIONS SECTION (Continued)

The UO_3 plant production was 156 per cent of the forecast. The feed from both Redox and TBP was irregular and several days of downtime resulted from lack of feed.

The 234-5 production for the fabricated large and small shapes was 150 and 100 per cent of the forecast respectively. The button and the nitrate production was 100 and 104 per cent of the forecast.

The West Area evaporator was inoperative the entire month because of equipment replacement. The East Area evaporator operated satisfactorily with a volume reduction of 46 per cent.

Metal waste removal continued to be slow because of the small remaining inventory of waste over three years old and TBP waste pump difficulties.

GENERAL

Effective October 1, 1954, the Transportation Section, the Purchasing and Stores Section, and the Electrical Utility Section were added to the Manufacturing Department. Monthly reports of activities in these service sections have been included immediately following the reports of the three operating sections.

Personnel

Total on Roll October 1, 1954	4533
Accessions	158*
Separations	40*
Total on Roll October 31, 1954	4651

*Does not include intra department transfers.

For J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

[redacted]

HW-33585 DEL

MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF OCTOBER 1954

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
NONE	

For J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

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MONTHLY OPERATING REPORT

OCTOBER 1954

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November 5, 1954

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
October, 1954

I. RESPONSIBILITY

There was no change in responsibility during this period.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	October	September	Year to Date
Acceptable Pieces Canned (8")(Tons)Gross	417	332	2575
Acceptable Pieces Canned (8")(Tons)Net	415	332	2553
Canning Yield (8")(%)	83	76.0	81
Total Acceptable Pieces Canned (Tons)Gross	417	332	2705
Total Acceptable Pieces Canned (Tons)Net	415	332	2681
Acceptable Pieces Canned (% of Forecast)	111	96	95
Autoclave Frequency (8")(No./M)	.01	.00	.01
J-3 Slugs Canned (pieces)	0	0	35964
N Slugs Canned (pieces)	0	0	33177
Chem. 10-66 Canned (pieces)	0	0	6782
C-4 Slugs Canned (pieces)	664	0	664
Special Request (man hours)	711	164	6117
305 Routine Tests (man hours)	231	176	3264
305 Special Tests (man hours)	432	618	8101
Average Steam Generated (M lbs/hr)	39.1	26.7	
Maximum Steam Generated (M lbs/hr)	71.0	71.0	
Total Steam Generated (M lbs)	29,100	19,300	
Coal Consumed (Tons)	1,876	1,170	
Sanitary Water from 3000 Area (Million Gals.)	61.1	63.4	
Total Water from 3000 Area (Average Rate--GPM)	1,369	1,468	

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2. Activities

The net production of acceptable slugs reached a new high of 415 tons, 83 tons greater than the record established last month. A canning yield of 83% was realized which is seven percent above the previous month. The poor bond rejection rate was substantially improved due to an outgassing process developed to release hydrogen from the surface of the slug and thus minimize the porosity difficulties experienced in September. Outgassing was achieved by heating the slugs to about 600°C in the salt bath heat treating facilities and quenching in water. Little grain growth was detected as a result of this process. Efforts are being continued to eliminate hydrogen absorption at the source. Continued emphasis on careful handling of slugs, together with the installation of improved chip breakers which reduce lathe curls at the facing operation, contributed substantially to an improvement in the marred surface reject category.

Five canning lines operated with full relief during the month.

One autoclave failure of an eight-inch normal uranium slug occurred during the month. This was caused by penetration resulting from a defective can.

Eight new autoclaves were accepted for service in the 313 Building. Slugs were charged immediately to reduce the in-process canned inventory which had accumulated due to a lack of autoclave capacity in September. All slugs exhibited an excellent film coating with no evidence of stain and the in-process inventory was reduced to normal by month-end.

Currently all caps and cans are supplied by a single vendor. To assure continuity of deliveries, efforts are being made to establish alternate vendors. Section personnel and members of Purchasing are working closely with another vendor to develop acceptable caps and cans.

The heat treating of untransformed uranium slugs in the salt bath facilities continued during the month.

The use of reclaimed lathe scrap in the canning baths continued. The silicon content was increased by adding 25% AlSi and a noticeable decrease in the use of virgin AlSi resulted. Insufficient experience does not allow an accurate evaluation of savings.

New Sonotest crystal mounts have been made for the transformation test equipment. These will simplify alignment problems by permitting minor adjustments in all directions and will improve the waterproofing of the lead cables.

A limited experiment was conducted in an attempt to ignite a uranium slug by heating it with a gas torch for 24 minutes. Although an internal temperature of 960°C was reached, self-sustained combustion did not result. After removing the torch, the slug cooled to room temperature without any visual effects other than surface oxidation.

3. Special Operations

A total of 316 thorium pieces were canned. One thousand two hundred seventy-six poison pieces were canned with a yield of 94%. A total of 1500 enriched "C" slugs were received during the month. More than half of these have been canned. Preliminary results indicate a canning yield of 87% may be realized after bubble testing.

4. Schedule Variance

Acceptable canned slug production was 111 percent of forecast due to improved yields and efficiency and the reduction of in-process canned inventory.

B. Equipment Experience

1. Operating Continuity

Canning efficiency improved one percent over September to a high of 95 percent. Better scheduling of preventive maintenance programs and continued emphasis on the elimination of lost time at start-up and shut-down by line supervisors were largely responsible for this improvement.

2. Inspection, Maintenance and Replacements

Since the capacity of the present component preparation line is insufficient to prepare special canning components in addition to regular components, the new "B" Slug Room (Hot Press Facility) is being set up independently to can slugs by both the "C" process and hot press methods.

C. Improvement Experience

1. Production Tests

PT-313-41MT "Fabrication of Unbonded Uranium Slugs" (HW-32378)
A total of 568 uranium slugs were received from Technical and canned by the "C" process under provisions of the production test. Approximately half are in process and awaiting autoclave at month-end. Included in the test were solid slugs, nickel-plated slugs, and cored slugs. A total of 185 slugs were canned by the lead dip process as control pieces for the unbonded slugs involved in this test.

PT-313-47MT "Cored Slugs From Extruded Blanks and Rolled Rods" (HW-33189)
A production test is being prepared and will be issued early next month for an extensive evaluation of cored eight-inch slugs canned by the lead dip process. These slugs will be fabricated from both alpha rolled and hollow alpha extruded beta heat treated rods. Two hundred fifty alpha rolled cored slugs were receive from Fernald during this period and an additional 1000 shipped. Forty-eight billets were alpha extruded by the Bridgeport Brass Company at Adrian, Michigan on October 25 and the resultant hollow rods have been shipped to Fernald for bet heat treating and machining.

2. Process Tests and Revisions

The life of an aluminum-silicon canning furnace charge has been extended to 140 days at month-end with no adverse effect on the slug quality. It appears that a build-up of iron in the metal will eventually necessitate its being discarded. Essential material savings will be submitted when maximum metal life is determined and sufficient experience confirms this initial test.

Sleeve processing time has been reduced by approximately fifty percent by increasing the caustic concentration and bath temperature on the sleeve preparation line.

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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

A 25% increase in production over the previous month has reduced the labor cost per unit and accounted for a further reduction in fabrication cost.

2. Material Variance

An increase in yield and reduction of in-process inventory has resulted in a slight decrease in the cost of fabricated material.

3. Other

Other costs remained substantially the same.

E. Plant Expansion

1. Project Status

Project CA-514 "Expansion of 300 Area Production Facilities"
Overall design is 99% complete and construction is 71% complete. Authorized funds remain at $5,085,000. Project costs plus commitments totaled $3,397,563 as of October 25, 1954. Modification of the existing 313 Building (Phase III) is 53% complete. Installation of process equipment (Phase IV) is 55% complete.

Alterations to buildings 3707-A, 3707-B, and 3706 are 28% complete. The 3707-A and 3707-B buildings are complete with minor exceptions. Final drawings on the 3706 building are being routed for approval signatures. There has been no significant change in the status of the work on general supporting facilities which is 74% complete.

Project CG-573 "Hanford 3X Program - 300 Area"
Total funds authorized for the project remain at $860,000. Cost plus commitments total $843,593. Field progress is 99.6% complete. Run-in tests on hot press canning equipment are being conducted.

2. Plant Engineering

In an effort to lower maintenance costs on the water lines, a study was initiated to determine optimum line pressures for the system. The first test run was started October 20, 1954 by lowering the Area pressure from the normal 95 PSI to 70 PSI. No conclusions have been reached at this time.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-33304	Monthly Report, Process Sub-section, Metal Preparation Section, September, 1954	EW O'Rorke	10-5-54
HW-33346	Statistical Quality Report 300 Area January through September, 1954	GX Beard	10-6-54
HW-33461	Monthly Cost Report, Metal Preparation Section, September, 1954	HS Krider	10-20-54

2. Non-Routine

HW-33250	Reliability of SF Weights of Transfer to 100 Area	EW O'Rorke	10-1-54
HW-33357	Hydrogen Content - Uranium Slug Cores	SM Gill	10-8-54
HW-33379	General Analytical Control Program I, Sample Identity, MCW	FR Anderson	10-12-54
HW-33380	General Analytical Control Program I, Sample Identity, MLO	FR Anderson	10-12-54
HW-33381	Effect of Uranium Slug Core Heat Treatment on Gas Evolution During Canning	SM Gill	10-1-54
HW-33428	Ingot Density	SM Gill	10-15-54
HW-33541	The Synthetic Normal Uranium Program	SM Gill	10-26-54
HW-33590	Aluminum Cans-Conformance to Can Wall Specification	TD Naylor	10-28-54

III. PERSONNEL

A. Organization

No change.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	2	2	0
Operations	186	190	+ 4
Power & Maintenance	318	324	+ 6
Process	82	84	+ 2
Projects & Personnel Development	11	12	+ 1
Section Total	599	612	+13

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C. Safety Experience

There were no major or sub-major injuries during the month.

D. Radiation Experience

There were no exposures in excess of 200 mrads reported during the month.

E. Personnel Activities

1. Visits and Visitors

W.M. Mathis visited the National Lead Company of Ohio and the Mallinckrodt Chemical Works for discussions with the Metallurgical Committee on fuel elements.

K.V. Stave visited Rice Institute and the University of Texas as a part of the Company recruitment program.

D.A. Snyder attended the Value Analysis Seminar at Schenectady, New York.

R.D. McCrosky of the Savannah River Plant visited HAPO to discuss factors involving autoclave failures.

2. Meetings

The Supervisor, Employment Unit, and members of his staff attended two tours of the 300 Area during the month in order to better anticipate types and needs of personnel in relation to future operations. Prior to each tour, representatives of Sub-sections met with these people and relayed information on personnel needs deemed valuable to the Employment Unit.

A study is underway to determine the particular needs to be embraced in a Supervisory Training Program for the Section.

Central records were established of information on a Section basis pertaining to attendance at Training and Development meetings and Selection Program Interviews.

On October 14, a discussion of Metal Preparation Cost Standards was presented in a Section Manager's meeting. Development, application and results of standards were discussed by the Budget and Cost Analyst.

Fifty-eight information meetings were attended by exempt and non-exempt personnel.

Fifty-eight safety and security meetings were attended by Section members.

Thirteen training and development programs (W-10) were attended by personnel of the Section.

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HW-33585 DEL

Richland, Washington
November 4, 1954

MANUFACTURING DEPARTMENT
REACTOR SECTION
MONTHLY REPORT
OCTOBER, 1954

I. RESPONSIBILITY

Responsibilities assigned to the Reactor Section were not changed during October.

II. ACHIEVEMENT

A. Operating Experience

Reactor time operated efficiency was 82.0 per cent in October, considerably below the 91.6 per cent efficiency of September, but slightly above the forecast. This relatively low efficiency was the result of an abnormally high amount of scheduled outage time, an unusually high number of slug failures, and extensive process tube leak testing outage time.

Total input, Pu, Mint and thorium input productions were 108.3, 108.9, 102.8 and 101.5 per cent, respectively, above forecast, as the result of the above forecast operating efficiency, and the postponement of a one week outage at C Reactor for rear pigtail replacement. Production charged to the Mint program at DR and C Reactors was 44.6 and 2.1 per cent, respectively. Production charged to the J-Q program at C and H Reactors was 7.5 and 7.9 per cent, respectively.

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A. Operating Experience (Continued)

Plutonium output production was 110.9 per cent above forecast primarily as the result of above forecast input production during several recent months, and the program of incremental increases in goal concentration. Tonnages of low and production concentration material discharged were approximately 270 and 100, respectively, representing forecast achievements of 97 and 127 per cent.

Goal concentration is currently base goal plus 125 megawatt days except at D Reactor where a pilot concentration program of base goal plus 225 megawatt days is in progress, and at C Reactor where the low concentration program, approximately one-third base goal, is in progress.

Maximum established reactor power levels were increased a total of 90 megawatts, 75 at F Reactor and 15 at B Reactor, primarily because of an increase in permissible outlet water temperature limits, although river water temperature is decreasing to the point where it again will become a factor in the achievement of new high levels.

October slug ruptures totalled 29, 23 eight-inch uranium ruptures at H Reactor, five "J" metal ruptures at DR Reactor, and one eight-inch PT-105-514-SI ("Irradiation Service - HAPO No. 107, Effect of Irradiation on Dimensional Stability of Uranium") rupture at D Reactor. The latter failure contained canned uranium disks. The September uranium rupture frequency represents the most severe experience in the history of Hanford reactors, exceeding the previous high frequency of 22 uranium ruptures in June 1954. The 1954 total of uranium slug failures passed, in October, the total of any previous year. The two "C" material ruptures awaiting confirmation in September have not yet been confirmed because of continued inoperability of C Reactor viewing facilities. Reactor outage time required for removal of October ruptures was 258.4 hours.

The high incidence of ruptures at H Reactor, all occurring in 17 tubes within a block of approximately 100 tubes immediately above the near side center of the reactor, has been attributed to high temperatures and frequent wide-range heat cycling, based upon a tendency of the loading pattern in this location to overheat during start-ups, and evidence that on one occasion during a start-up tube temperatures in this block were above process limits for one or two minutes. To minimize the opportunity for further ruptures in this zone from this cause, approximately 40 tubes were discharged. In addition, the loading pattern in this region is being studied with the objective of eliminating the causes for this condition.

On October 15, DR Reactor completed a remarkable 51 day period of continuous operation as the result of an unexplained Panellit scram.

A. Operating Experience (Continued)

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	82.9	81.2	87.4	86.9	95.9	57.6	82.0
Reactor Outage Time (Hrs)							
Plutonium Production	127.5	135.6	84.4	29.5	21.9	306.9	705.8
Special Irradiations and Tests	0	4.5	9.3	68.0	8.5	8.8	99.1
Total	127.5	140.1	93.7	97.5	30.4	315.7	804.9
Reactor Unscheduled Outage Time (Hrs)	0	34.9	28.9	2.2	2.0	315.7	383.7
Metal Discharged (Tons)	76.5	130.4	40.4	8.5	55.5	53.1	365
Water Quality (ppm Iron)							
Raw Water - Average	0.05	0.05	0.04	0.05	0.05	0.06	
Raw Water - Maximum	0.07	0.07	0.05	0.06	0.06	0.09	
Process Water - Average	0.004	0.007	0.005	0.003	0.005	0.006	
Process Water - Maximum	0.006	0.009	0.007	0.005	0.007	0.009	
Water Pumped (MM Gals)							
Bldg. 190 to Reactor	1937	3312	2000	1732	1995	1710	12686
Bldg. 182 to 200 Areas					355		355
Bldg. 181	5794		4465		2735	1998	14992
Steam Generated (MM Lbs)	152		221		147	83	603
Coal Consumed (Tons)	9197		13450		9233	5937	37817

2. Activities

Previous outlet water temperature limits based upon "trip-before-boiling" were superseded during the latter part of October by temporary "trip-before-instability" outlet water temperature limits as specified in Process Standard 105-A-030, "Process Tube Outlet Water Temperature Limits - Trip-Before-Instability." These temporary limits are, B Reactor 105 C - up 5C, C and F Reactors 100 C - up 5C, and D, DR and H Reactors 95 C - no change.

Preparations for the operation of KW Reactor continued. At month end, detailed start-up procedures were approximately 95 per cent complete, and Standard Operating Procedures, applicable to K Reactors only, were 30 per cent complete. Work on the fabrication of special maintenance tools for 100-K Area was approximately 60 per cent complete at month end.

The recently organized paint crew completed work in 100-B and F Areas, and at month end had moved to 100-D Area to begin scheduled work.

Charge-discharge activities associated with major special irradiation programs included the discharge, without recharging J-N, of

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A. Operating Experience

2. Activities (Continued)

181 J-N tubes at DR Reactor, leaving a balance of 736 second loading tubes in the reactor, and the discharge, with J-Q material recharged, of 41 J-Q tubes at H Reactor. Three additional J-Q tubes were charged at C Reactor. Total J-Q tubes charged at C and H Reactors at month end are 153 and 160, respectively.

Shipment of irradiated "J" slugs from DR Reactor to Arco, Idaho continued at the scheduled rate. Thirty-two casks containing a total of 2050 pieces were shipped.

The following table indicates activities during October associated with special irradiations other than the Mint and J-Q programs noted above:

	Tubes Charged	Tubes Discharged	Casks Shipped
Rala	0	7	2
Production Tests	8	9	7
Total	8	16	9

B. Equipment Experience

During October, 23 reactor scrams occurred. Of these, 16 at C, DR, F and H Reactors were caused by normal Panellit system variables. One scram at D Reactor resulted from an electrical failure in the circuit supplying the Ball 3X - No. 2 safety circuit intertie when the horizontal rod gate circuit was grounded by causes unknown. One scram at DR Reactor occurred during a start-up as the result of a high level Beckman trip, which also caused a scram at D Reactor through the intertie circuit. Two Beckman scrams occurred at F Reactor, the first as the result of unintentionally by-passing three Beckmans and the other as the result of suspected induced transient pulses in the present wiring. This condition is being investigated further. One scram at DR Reactor resulted when an oil line on the No. 2 horizontal rod shim pump broke. One scram at H Reactor resulted from a momentary unexplained low flow on recirculation tube 0961-H (PT-105-506-E - "Recirculation Studies.") Total outage time resulting from these scrams was 37.0 hours.

Process tube leak testing was done at B, C, DR and H Reactors. At B Reactor, approximately 100 tubes were tested prior to locating a leaking Van Stone flange. At C Reactor, approximately 750 tubes and all horizontal rods were tested. One minor nozzle leak was found, and nozzles on approximately 530 tubes were tightened. When water collection rates continued to increase, approximately 560 additional tubes were tested during the next scheduled outage. One leaking tube was found and replaced. At DR Reactor, approximately 700 rear tube

B. Equipment Experience (Continued)

nozzles were tightened. At H Reactor, a September leak testing outage continued into October. A total of 864 tubes were tested and nozzles on 1150 tubes were tightened without finding a leak. When collection rates continued high, 151 additional tubes were tested with no leaks found. At month end, all collection rates are normal. Leak testing programs involved approximately 125 hours of outage time during October.

Horizontal rod performance in October was less satisfactory than in recent months. At DR Reactor, rod thimbles 2,5,7, and 8 were found to be leaking. At F Reactor, rod 4 was found to be binding due to track buckling, with thimble rupture suspected. At B Reactor, rod A was found to be leaking and was replaced. At H Reactor, rods 9 and 14 and their thimbles were found to leak. Rod repairs included rod and thimble 7 replacement at D Reactor, and thimble A replacement at B Reactor. In addition, at C Reactor rods 3 and 4 were cleaned internally using a 10 per cent chromic acid solution. Gains in rod exit water pressure of approximately five pounds resulted.

The B Reactor discharge elevator caused approximately 15 hours of outage time during the month as the result of a brake shoe jamming and electrical difficulties. The latter resulted from water in the discharge area conduit to the far side motor, and required temporary rewiring.

Reliability checks of all Panellit systems during October revealed 121 faulty trips as detailed below:

	High Trips	Low Trips	Total
B Reactor	10	4	14
C Reactor	6	1	7
D Reactor	6	11	17
DR Reactor	5	4	9
F Reactor	24	4	28
H Reactor	36	10	46
Totals	87	34	121

The 121 faulty trip total in October is identical to the total faulty trips in September. However, since the September total included tests at but four reactors, improved gage performance is indicated. The effectiveness of watch oil in reducing pivot corrosion was demonstrated when only four of 26 H Reactor pivot corrosion trips occurred on oiled gauges.

Overheating of the Building 190-C 3500 HP process pump motors continues to be a problem. Load and temperature data were collected throughout the month to permit further study.

No. 10 motor was removed from service due to failure of the inboard pump seal. Inspection revealed excessive wear to the impeller shaft, necessitating remetalization.

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B. Equipment Experience (Continued)

Two 800 HP Building 190 process pump motors, No. 7 at D Area and No. 10 at DR Area, failed during routine start-ups. Cause of the failures was determined to be insulation failure between coil turns at the bullring.

Seismoscope failures were experienced at D and DR Reactors during the month. At D Reactor, the cause was found to be a breakdown in a resistor-capacitor network which caused vacuum tubes to burn out. At DR Reactor, one of the three seismoscope relays was functioning incorrectly as the result of improper connections. At both reactors proper remedial action was taken.

C. Improvement Experience

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

PT-105-4-MR Suppl. C (Poison Column Control Facility)
After more than a year of successful use of this facility to supplement reactivity control, the operation has become routine and the time necessary to calculate production gains attributable to the facility is no longer considered justified. The Production Test will remain effective until the operation is specified in Process Specifications and Process Standards. However, no further reporting in this section of the report is planned unless unusual circumstances warrant it.

PT-105-7-MR (Irradiation of High Quality Production Uranium Slugs)
PT-105-539-E (Slug Exposure at a Concentration of 900 MWD/Ton)
Both of these tests continued during October without incident.

PT-105-8-MR (Uranium Charging During Reactor Operation)
There was no action on this test during October. Two tubes at B Reactor are currently being irradiated under this test for later discharge during operation.

PT-MR-105-24 (High Rate Water Treatment at Post CG-558 Flows)
This test continued satisfactorily during the month. Water quality was maintained without incident at an average filtration rate of six gpm per square foot. Filter runs continued to be approximately 12 hours in length.

C. Improvement Experience

PT-105-506-E Suppl. C (Recirculation Studies)
During October, recirculation tube 0961-H was replaced with a zirconium tube to permit evaluation of this type tube. The revised recirculation tube was operating at month end with an outlet temperature of approximately 180 C. One H Reactor scram resulted from a momentary unexplained low flow trip on this tube. Outage time resulting from the scram was 0.4 hour.

PT-105-562-A (Slug Evaluation at Increased Levels for Tritium Production)
Irradiation of the remaining 12 J-N columns under this test at C Reactor continued without incident.

PT-105-567-A (Preliminary Irradiation of J-Q Columns)
PT-105-579-A (Quantity Irradiation of J-Q Columns)
Irradiation of the remaining 12 test J-Q tubes in H Reactor continued without incident during October. At H Reactor, 41 tubes of J-Q were discharged and an equal number recharged in the quantity irradiation program.

Two revised Process Standards - Reactor were approved and issued during October. These were Standards titled: "Process Tube Outlet Water Temperature Limits - Trip Before Instability," and "Panellit System Control." In the first Standard, new outlet temperature limits are based on the water temperature at which unstable boiling occurs in a tube, rather than on the saturation temperature of the water in the rear crossheader, the basis for the previous trip-before-boiling limits. Temporary arbitrary limits were specified for all reactors pending additional experience with this philosophy. The second Standard was revised to include specifications on Panellit gage adjustments, calibration and inspection as one step in the program for minimizing Panellit gage failures.

An improved method of handling tube dummy slugs has been developed at C Reactor. When tubes are set up for discharge, the non-irradiated dummies are manually removed from tubes and deposited in containers on the discharge elevator for subsequent removal direct to decontamination facilities. This procedure minimizes pickup time and conserves C Reactor storage basin and bucket space which is at a premium because of the low concentration program. Adoption of this technique at DR Reactor during discharge of J-N tubes has resulted in a 10 per cent increase in the discharge rate by reducing the number of pieces which must be handled during the required special pickups.

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.

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D. Events Influencing Costs

Major events which influenced October costs were primarily adverse in nature, and included an approximate six per cent decrease in production despite the longer month, a record slug failure frequency, a continued large amount of leak testing work, and an increase in the amount of horizontal rod maintenance work. In addition, coal costs increased approximately $2,300 as the result of reduced combustion efficiency at 100-H Area and the addition of ten cents per ton to the cost to be utilized as an accounting reserve fund.

Beneficially affecting costs was a reduction of approximately $4,500 in Power Sub-Section chemical costs.

Operating costs at DR Reactor were favorably affected by decreasing crew sizes as permitted by a reduction in the work load associated with the Mint program. A reduction of five operators was effected. With a minor amount of overtime, the standard crews are able to perform the work.

The semi-mechanized system of trash disposal using Brooks load luggers and trash containers was established in all 100 Areas during October. Four men were made available for other work, and additional savings are anticipated from further simplification of trash disposal. Total savings have been estimated at approximately $20,000 per year.

Reactor Section charges to the expansion program for October continued to increase as additional manpower was added for the staffing of 100-K Area.

Preparations for revision of the Reactor Section Manual of Standard Costs were made during the month. Standard costs for the current operations were brought up to date, and standards for 100-K Area were added. Issue of the revised manual is scheduled for early November.

Preliminary estimates indicate that both plutonium irradiation and total irradiation unit costs will be approximately 10 per cent higher in October as compared to September as the net result of the decreased production and increased maintenance activity. New record low unit costs for both plutonium and total irradiation were established in September.

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 J. H. Warren, dated October 20, 1954.

E. Plant Development and Expansion

1. Project Status (Continued)

CA-512 (100-K Facilities)

Construction completion percentages for the K Reactors and Water Plants estimated by the AEC as of October 15, are:

KW Reactor	99.6	up 0.3
KE Reactor	89.4	up 5.6
General Facilities	92.7	up 1.8
KW Water Plant	99.2	up 0.6
KE Water Plant	92.8	up 2.9

The Power Sub-Section began operation of the Building 165-KW boilers and Building 183-KW filter plant on October 6 and 19, respectively, at the request of the Reactor Projects Sub-Section. Building 183-KW was accepted by the General Electric Company on October 29.

A dynamic flow test of KW Reactor which began on September 30 and which involved increasing the flow to 180,000 gpm revealed the following:

a. Vibration in the outlet piping requiring installation of additional snubbers at expansion joints.
b. Satisfactory downcomer operation except for changing an orifice plate to smooth out approach section flow.
c. Failure of 18 front pigtails due to excessive vibration.
d. Reduction in vibration by factor of 40 when a horizontal tube row was loaded with dummies.
e. An appreciable number of temperature monitor thermometer bulbs were damaged by high flows.

Pigtail failures are being investigated and new connectors are to be procured on an emergency basis.

Nine acceptance tests of a total of 76 related to KW Reactor have been completed, and at month end acceptance testing as a whole is estimated to be 50 to 60 per cent complete.

At KE Reactor, work has progressed to the point where hydrostatic testing of inlet piping is in progress.

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E. Plant Development and Expansion

1. Project Status

CA-512 (100-K Facilities) Continued

The first secondary pump casing of new acceptable design for the KE Water Plant was received. Remainder are scheduled for delivery at a two per month rate.

CA-431 (100-C Plant)

A majority of C Reactor rear face pigtails together with significant numbers of fittings had been received at month end, with delivery of all materials scheduled by mid-November. Pigtail replacement has been tentatively scheduled for late in November.

Alterations to the east 107-C retention tank have been rescheduled for completion immediately after installation of the new B Reactor effluent line which is anticipated by April, 1955.

The Reynolds Metal Company continues to work on dies for extrusion of C Reactor replacement horizontal rods. The fourth die was broken during extrusion attempts, and no successful extrusions have yet been produced.

CG-558 (Reactor Plant Modification for Improved Production)

Scope design for Project CG-558 is estimated to be 91 per cent complete at month end. A draft of the revised Project Proposal is being circulated for comment. This proposal moves the target date for beginning major outages back eight and one-half months to September, 1956. The outages are scheduled for eight weeks per area in B, DR, D Reactor sequence.

Alcoa produced 16 horizontal rod extrusions during October of which 15 were acceptable. The boron carbide ring vendor has produced 7,000 rings to date, almost all thick walled. No thin walled rings have been produced on a production line basis.

CG-567 (Activated Silica - Alum Water Treatment Facilities, Phase I - 100-B, D, DR, F, and H Areas)

Exceptions to the Building 183-B, D, and H facilities were corrected during the month, completing this project except for final inspection planned for the first week in November.

E. Plant Development and Expansion

2. Plant Engineering

A number of engineering and development studies were active in the Section during October. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in document HW-33620. Several items of interest are reported below.

Investigation of the possibility of detecting leaking process tubes using the helium leak detector continued, using a centrifugal type pump to place a tube with a one gpm cooling flow under vacuum. A very slight vacuum in the rear portion of the tube and in the rear crossheader was achieved only momentarily as the result of the pump losing its prime. The investigation will be continued using a syphon type evacuator.

In the noise study program, material for evaluating the pipe covering method of noise suppression in Building 190-C has been ordered, with delivery promised by the end of November. Noise level data were obtained at Buildings 190-KW and 165-KW during a one hour period of pump operation at maximum flow conditions on October 6. Although time did not permit a complete survey, available data are being analyzed to determine the noise levels that may be anticipated in these buildings during operation.

Permanent resin release agent films are being tested on reactor discharge area equipment to determine their effectiveness in reducing contamination buildup. A total of 195 outlet nozzles and caps were degreased, double dipped in Dow-Corning silicone resin XR 671, and cured at 350 F for 12 hours. These nozzles have been installed at KE Reactor for evaluation.

Work on a program to develop methods and equipment for improved removal and replacement of process tubes is in progress. The program is proceeding along two phases, improvement of conventional methods, and investigation of the feasibility of tube removal and replacement without removing and replacing nozzles. With the use of remotely operated rear nozzles, the latter presents the possibility of eventual tube replacement during operation.

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F. Significant Reports

1. Routine

Monthly operating reports issued for September were:

HW-33200-A	Reactor Section	J. H. Warren	10/7/54
HW-33364	Operations Sub-Section	R. O. Mehann	10/1/54
HW-33263	Process Sub-Section	O. C. Schroeder	10/1/54
HW-33273	Projects and Personnel Development	F.A.R. Stainken	10/1/54
HW-33300	Radiation Monitoring Sub-Section	P. C. Jerman	10/5/54
--	Maintenance Sub-Section	E. E. Weyerts	10/5/54
HW-33303	Power Sub-Section	J. C. McLaughlin	10/5/54

Other routine reports issued during October included:

HW-33510	"Monthly Progress Report, Reactor Section Expansion, October, 1954."	H. T. Wells	10/22/54
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items."	F.A.R. Stainken	10/20/54
--	"Reactor Section Process and Cost Improvement Report, July to September, 1954."	J. H. Warren	10/7/54
HW-33260	"Reactivity Balance and Associated Data - Period August and September, 1954."	R. E. McGrath	10/1/54

2. Non-Routine

HW-33365	"Hot Start-Up Tube Temperature Limit."	O. C. Schroeder	10/8/54
HW-33074	"An Analysis of Reactor Drying by the Methods of Hot Water Recirculation and Reactor Operation."	P. C. Walkup	10/7/54
HW-33254	"The Effect of Reactor Tube Corrosion on Optimum Water Flow Distribution."	K. W. Hess	10/7/54
HW-33383	"Final Report, Process Test MR-105-22 and Process Test MR-105-22 Supplement A, Installation of Rear Header Orifices."	A. K. Hardin	10/26/54
HW-33550	"Cost Standards for Applied Materials and Liquidations (Inter-Area and Landlord)."	G. W. Wells	10/25/54
Confidential Undocumented	- "Orsat Gas Analyzing Equipment - 105 Buildings."	J. W. Ballowe	10/7/54
--	"Space Requirements in the 105-B, D, and F Buildings."	R. Willing	10/12/54

III. PERSONNEL

A. Organization

There were no appointments made in the Reactor Section during October.

Effective October 1, 1954, the 100-K Maintenance Unit was established in the Maintenance Sub-Section.

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	2	- 1
Operations	333	343	+ 10
Maintenance	543	555	+ 12
Projects & Personnel Development	38	38	0
Power	452	467	+ 15
Process	55	59	+ 4
Radiation Monitoring	78	77	- 1
Section Total	1502	1541	+ 39

Changes during October included 32 transfers into the Section, 10 transfers out of the Section, 27 new hires, seven terminations, two reactivations, and five deactivations. Reactor Section force increases were the result of the addition of manpower to staff 100-K Area.

C. Safety Experience

No Major or Sub-Major Injuries occurred in the Reactor Section during October.

In compliance with the recommendations resulting from the investigation of Major Injury No. 106, reported in September, modifications have been completed on the forced draft fan drain lines in the Buildings 184 concerned.

D. Radiation Experience

One Class II Radiation Incident and one Class I Radiation Incident occurred in the Reactor Section during October. Class II Incident No. 81 occurred at D Reactor on October 5, and involved a radiation monitor who received an exposure greater than that planned during the removal of irradiated metal from a discharge area catwalk, as the result of inadequate timekeeping. This resulted in a total exposure above the permissible limit for the seven-day period. Class I Incident No. 386

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D. Radiation Experience (Continued)

occurred at B Reactor on October 8, and involved a rigger who received unplanned exposure to high level radiation as a result of inadequate communication while returning a horizontal rod to operable status. These incidents are described in detail in documents HW-33478 and HW-33474, respectively.

At C Reactor, the storage basin water level was lowered 18 inches to control the spread of contamination by eliminating the need for raising a portion of the bucket yokes normally in the water above floor level when moving buckets. Steps are also being taken to eliminate the possibility of contamination spread from yokes used for loading cask cars.

E. Personnel Activities

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

Additional staffing of KW Reactor facilities continued in October. Addition of pile and utility operators completed Operations Sub-Section personnel at KW Reactor. Transfer of personnel to staff the KE Water Plant backup facilities for KW Reactor completed the Power Sub-Section complement.

During October, Reactor Section staff members presented informal talks on reactors, supplemented by showings of the film "A Is For Atom," to church and service groups. On October 7, J. H. Warren addressed the Kiwanis Club of Chehalis, Washington. On October 12 and 26, O. C. Schroeder addressed the "88 Club" of the First Presbyterian Church of Yakima, Washington, and the Rotary Club of Milton-Freewater, Oregon, respectively.

Approximately 35 showings of the film "The Atom Goes to Sea" were held for Reactor Section personnel in all areas during the period October 25 through November 1.

A dinner meeting for approximately 90 members of Reactor Section supervision was held on the evening of October 12, at the Desert Inn Hotel. Guest speaker for the occasion was W. K. MacCready who spoke on the results of the special studies he has made during the past year.

R. D. Schilling of the Process Sub-Section visited the General Engineering Laboratories in Schenectady, New York, on October 4, to expedite the development of a probe for the in-place measurement of process tube wall thickness and to discuss the feasibility

E. Personnel Activities (Continued)

of a reactivity transient computor. On October 5 through 8, he attended the meeting of the Professional Group on Nuclear Science of the Institute of Radio Engineers in Chicago.

G. B. Coover of the Process Sub-Section visited Fenwal, Incorporated, Ashland, Massachusetts, and the Sheffield Corporation, Dayton, Ohio, on October 26 and 27, respectively, for consultation on instrumentation problems.

G. V. R. Smith of the Projects and Personnel Development Sub-Section attended a conference meeting of the Washington State Department of State-Federal Apprentice and Job Progression Training Panel in Pasco, Washington on October 7, to discuss the purposes of these programs, and methods of company participation in the programs.

J. D. McCullough of the Projects and Personnel Development Sub-Section conducted two training courses for Operations Sub-Section personnel on the operation of the new KW Reactor temperature monitor.

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Richland, Washington
November 5, 1954

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
OCTOBER, 1954

I RESPONSIBILITY

The responsibility for operation of the 200 West Process Laundry was assigned to the Separations Section, Radiation Monitoring Sub-Section, effective October 15.

II ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	October		September	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	81	1	74	0
Charges completed in Conc. Bldgs.	79	2	75	1
Special charges - Conc. Bldgs.	7		4	
Charges completed-Isolation Bldg.	302		328	
Average Waste Losses, %	3.07		2.39	
Special charges-Isolation Bldg.	44		31	
Material balance, %	101.5		99.85	
Yield through Process, %	98.45		97.46	
Average cooling time (days)	84		91	
Minimum cooling time (days)	60		60	

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b. Redox Operations

	October	September
Equivalent charges started	249.7	241.8
Charges completed	246.0	244.4
Tons Uranium delivered to storage	155.1	154.1
Average Production Rate per operating day, Tons	6.7	6.2
Average Daily Operating Rate for the month, Tons	5.0	5.1
Average yield, %		
Uranium	97.5	96.4
Plutonium	99.7	100.5
Total Waste Loss, %		
Uranium	1.45	1.71
Plutonium	0.58	0.60
Average cooling time, days	134	102
Minimum cooling time, days	101	90
Percent down time	26	18

c. 234-5 Operations

	October	September
Batches completed through Task II	127	130
Runs completed through Task III	121	125
Reduction yield, RM	98.3	97.0
Waste Disposal, units	3.70	2.27

d. UO_3 Operations

	October	September	To Date
Uranium drummed, Tons	296.88	307.11	7710.16
Uranium shipped, Tons	245.81	332.75	7643.12
Average cooling time, days (Redox)	140	126	
Minimum cooling time, days (Redox)	105	106	
Waste loss, %	0.02	0.05	

e. TBP Operations

	October	September	To Date
Tons received from Metal Removal	71.25	158.22	4639.55
Tons shipped to UO_3 Plant	72.59	165.51	4494.01
Average Production Rate per operating day, Tons	4.98	6.53	
Average Daily Operating Rate for the month, Tons	2.34	5.51	
Average yield, %	103.24	98.82	

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e. TBP Operations (Continued)

	October	September
Total Waste Loss, %	1.24	0.75
Ratio Waste Volume returned to Volume removed	1.73	1.39
Percent Down Time	52.99	15.45

f. Power

	200 East	200 West
Raw water pumped, gpm	1 416	6 824
Filtered water pumped, gpm	443	882
Steam generated, lbs/hr	46 076	131 209
Maximum steam generated, lbs/hr	89 583	190 558
Total steam generated, M lbs.	33 175	97 657
Coal consumed, tons (est.)	2 161	6 387

g. Waste Storage

	Equivalent Tons U	
	Oct.	Sept.
Metal Waste reserve storage capacity - T Plant	551	658
1st Cycle reserve storage capacity - T Plant	819	611
Metal Waste reserve storage capacity - B Plant	1097	1001
1st Cycle reserve storage capacity - B Plant	74	74
Redox Waste reserve storage capacity	1210	1304

2. Activities

a. Redox Processing

A production rate of approximately 6 tons/day was maintained in the Redox Plant during the first five days of the month. On October 5, the Plant was shut down to complete the J-2 (second ruthenium scrubber) jet out installation to permit jetting the J-2 bottoms to the D-8 (waste neutralizer) tank, and to replace the D-13 (waste receiver) tank and associated equipment which was damaged last month when a vapor phase reaction took place in the tank. Operations were resumed on October 9, with an average rate of approximately 7 tons/day maintained until October 21 when a second shut down was made to replace the D-8 (waste neutralizer) and G-5 (centrifuge feed) tank agitators which had failed. Operations were resumed on October 24 with an average rate of approximately 7 tons/day maintained through month-end. Start-ups after both shutdowns were delayed due to difficulties experienced with the 60 ton crane. Difficulties in head-end processing and an obvious drop off in the first extraction cycle feed

a. Redox Processing (Continued)

pump capacity prevented the Redox Plant from obtaining the 8 ton/day rate the maximum throughput which can be processed without resorting to a backcycle flowsheet since the present waste concentrator is limiting.

b. Metal Recovery Processing

1) TBP Processing

A and B Lines operated approximately 48 percent of the time during the month primarily due to insufficient tank farm inventory of aged material to warrant two line operation, failure of the WR001 waste pump, maintenance work and start of work on A Line to convert to series operation.

2) UO_3 Processing

Several days of operational down time were experienced, due to a lack of feed material and maintenance work in TBP Plant, however production commitments were exceeded.

Operation of the gas fired Luckey pot continued throughout the month, however difficulties have been encountered in obtaining reproducible results. Experiments are continuing, and it is felt that a satisfactory cycle and control system can be determined.

3) Waste Metal Removal

Blends of the last of the "aged" supernates in 104C (BX-BY) and 104-TX (TXR) constituted shipments to TBP, however production for the period was low due to failure of the WR001 waste pump and difficulties in TBP including conversion to series operations. Sludge removal in 104-BX continued and 105-BY was officially declared empty. Shipment of the last of the "aged" material (minimum age of 3.1 years) should be completed early in the coming month.

The WR001-2 pump which failed in locked rotor at the end of last month was repaired, and waste scavenging was resumed at the start of the month. A low pH waste in WR001 resulted in loss of this pump again on 10-14-54 due to severe corrosion. Repairs were made, and the pump ran satisfactorily from 10-20-54 to month-end. Even with the difficulties encountered all wastes from the TBP operations were scavenged.

c. Isolation and Metal Fabrication Processing

Operations were essentially normal in the Isolation and Metal Fabrication operations. Four double batches of approximately 200 MWD material in boats were processed through Task II, hydrofluorination,

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c. Isolation and Metal Fabrication Processing (Continued)

and delivered to the Engineering Department for testing and conversion. This material will be returned to operations for fabrication in November. After fabrication neutron emission will be measured and this information will be correlated with earlier data to expand the curves used to predict neutron count based on exposure during formation in the piles.

d. T Plant Processing

Although minor mechanical and operating difficulties were experienced during the month, T Plant production schedule was exceeded and three new records established. Metal solution storage capacity has been increased by approximately 12% and dissolver operating flexibility has been improved, by eliminating the addition of 5000 lbs. of wash water in the 4-8 metal solution storage tank. Proper processing concentrations are obtained by adding the required water to each batch of metal solution in the extraction make up tank.

3. Special Operations

a. Waste Evaporators

There was no processing in 242-T Waste Evaporator during the month as the coils and steam lines are being replaced. Upon completion of the maintenance work, the next scheduled feed will be T Plant first cycle waste. Operation of 242-B Waste Evaporator continued satisfactorily until October 27 when the building was shut down. Depending on whether or not it is deemed necessary to evaporate the waste contents of 112-B tank, there appears to be no future plans for this building now that the scavenging program is in full effect.

Evaporator	Gallons Feed	Gallons Bottoms	Gallons Concentrate	% Volume Reduction
242-B	422 968	229 625	193 343	45.7
242-T	0	0	0	0

b. Plutonium Recovery, 234-5

Recovery of skulls was satisfactory during the month, however, all other recovery activities were curtailed in order to aid Redox in minimizing variables in their process.

4. Schedule Variance

Production commitments in all Separations Plants were exceeded during the month, and several noteworthy achievements obtained. In T Plant, three new production records were established, namely

4. Schedule Variance (Continued

(1) total metal dissolved, (2) total runs shipped, and (3) total runs started. In Metal Fabrication, the previous fabrication record was exceeded by 4.4 percent.

Redox Plant production of separated plutonium was 123% of forecast while T Plant achievement was 111% of forecast. Total plutonium separated was 120% of forecast.

The Metal Fabrication monthly commitment for Model 110 and 130 shapes and buttons was 150%; 100% and 100% respectively.

Uranium recovery production exceeded forecast as the TBP Plant attained 123% and the UO_3 Plant 155% of forecast. A total of 7 carloads of UO_3 powder was shipped in October.

B. Equipment Experience

1. Operating Continuity

Redox down time totaled 193 hours for replacement of the D-13 (waste receiver) tank and the agitators to the D-8 (waste neutralizer) and G-5 (centrifuge feed) tanks, and to complete the installation of the J-2 (second ruthenium scrubber) jet out equipment.

TBP Plant down time totaled 32.8 days for both "A" and "B" Lines for maintenance work, insufficient tank farm inventory to warrant two line operation, failure of the WR001 waste pump, and shut down of "A" Line at month-end for conversion of the line for series operation.

Approximately 5% of the available operating time in the Isolation Building was interrupted to complete necessary maintenance repairs. Operating continuity was maintained in Metal Fabrication by making a temporary water connection to the building supply lines after a leak developed in the main water line to the building.

In T Plant, 8 hours of production time was lost during a scheduled steam shutdown, and approximately 28 hours additional time was lost in the Concentration Building due to the necessity of reworking waste solutions.

2. Inspection, Maintenance and Replacement

a. D-13 (Waste Receiver) Tank - Redox

The D-13 (waste receiver) tank, in which a vapor phase reaction took place as reported last month, was replaced. Significant facts noticed during removal of this tank were:

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1) All three hold down stud bolts were broken off by the reaction.

2) The top was definitely bulged upward distorting the tank nozzle alignment.

3) The dished bottom of the tank had been forced out so that the bottom of the tank had a concave shape.

Photographs were obtained of the vessel in an effort to record and evaluate the effects of the reaction.

b. G-3 Organic Still - Redox

Visual inspection of the G-3 organic still revealed two leaks, however, operation of the pot has not been seriously affected. Plans for installing the new D-12 waste concentrator have been delayed to hold this pot as an emergency replacement for the G-3 pot should the leak increase.

c. Agitator Replacements - Redox

A replacement was made of the D-8 (waste neutralizer) and the G-5 (centrifuge feed) tank agitators, both of which failed due to bent shafts presumably caused by operating the agitators with too low a liquid level in the tanks.

d. 60 Ton Crane - Redox

Difficulties with the operation of the 60 Ton crane hampered the remote maintenance work and prolonged shutdowns during equipment replacements. Improperly operating impact wrenchs had to be repaired, and festoon cables and one impact wrench had to be replaced. Time limits for nearly all the crane work was from ten to twenty minutes which further complicated the repair and replacement work.

e. WR001-2 Pump - Waste Metal Removal

The special pump which was installed for waste scavenging pump-off and failed last month, was replaced. Acidic solution in the WR001 tank caused excessive corrosion to the pump, necessitating another replacement. The new pump with revisions to increase its capacity is pumping 90 gpm at month-end.

f. Water Line Leak - Metal Fabrication

A leak under the floor of the 234-5 Building in Zone I area developed in the 6" main water line. Temporary measures were taken to bypass the leaking area to maintain production while repairs were completed.

C. Improvement Experience

1. Process Tests and Revisions

a. Uranium Decontamination - Redox

Studies and tests are being made in Redox Plant towards improving the uranium decontamination factor. Filterable solids were found in the final uranium product stream and continued evidence of liquid entrainment in the organic bearing effluents was noted. Among the steps being taken to solve this problem are fabrication and installation of an interface jet to periodically remove interface material and continued process changes within the building which appear to merit evaluation.

b. Addition of Sulfamic Acid to UO_3

The addition of Sulfamic acid which increases the reactivity ratio for UO_3 conversion to UF_4, has been stabilized at 0.05 weight % sulfamic acid for all material produced. There was no significant difference in the reactivity ratio of shipments with varying sulfamic additions. Since the use of sulfamic acid significantly increases the tendency of UO_3 to cake in the pots, the substitution of Thiourea is being made on a test basis in an effort to eliminate this trouble.

c. Circulating Gas Coating - Metal Fabrication

Testing of the second circulating coating gas unit was completed this month after which the unit was placed into routine production line service. Several improvements have been made over the first design, among which is an automatic timer for rotating the piece and an automatic head cut-off device. This feature permits the coating cycle to be completed automatically once the coating gas is admitted. When the coating has been completed, an alarm sounds, calling the operators attention to the fact that the piece is cooling.

d. Scavenging of First Cycle Waste - T Plant

Scavenging of First-Cycle waste was initiated on October 20. The test is being conducted to determine if scavenging the first-cycle wastes in the Bismuth Phosphate Plant will give a supernatant liquor, after the precipitate settles, that may be routinely cribbed. The test will also determine the procedure needed for effective scavenging, shakedown of the pH monitoring instrument, and train operating personnel.

2. Inventions or Discoveries

Personnel in the Separations 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.

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D. Events Influencing Costs

Although production from the major Separations plants, excepting TBP, remained at essentially the same level as September, October expenditures are expected to reflect a slight increase over September expenditures. The decrease in expenditures associated with the lower TBP production will be more than offset by the increased maintenance activity and personnel training connected with the startup of Purex, B Plant and Recuplex.

Efforts are continuing and progress is being made towards reducing the time cycles and material consumption in T Plant, however, savings resulting to date from this program are not readily determinable. A reduction in the work load in the 234-5 Laboratory made possible by the Quality Control Program initiated by the Analytical Sub-Section will result in an annual saving of approximately 480 man-hours.

E. Plant Development and Expansion

1. Project Status

a. Project CA-513-A Purex

Construction advanced approximately 9.5% during the period, however the project is approximately 13% behind schedule. The ready for operation date is estimated now to be one month later, or September 1, 1955. Repair work to correct the poor welds found in some vendor fabricated equipment is progressing satisfactorily. The mock-up shop which is one of the construction bottlenecks, is being doubled in size by the addition of a temporary structure.

Design work on project CG-598, Vacuum Acid Fractionator, is progressing satisfactorily. Completion date is scheduled for December 1, 1955.

b. Project CG-551, 234-5 Expansion

Fabrication, mock-up and testing of Task III equipment in the 272-W Shops continued during the month. Shop work is approximately one week behind schedule. Site preparation for installation in 234-5 Building has started and will continue during November.

The installation of Final Inspection Facilities in Room 192, 234-5 Building was resumed after the receipt of construction material. No further hold-ups due to slow material deliveries are anticipated.

c. Project CG-535, Redox Expansion, Phase II

1) 233-S Concentration Building: The major process units are installed and work on all phases is continuing on a schedule which indicates that a ready-for-operation date of February 1, 1955 can be met.

2) UNH and ANN Storages: The two UNH storage tanks have been in service since October 15, 1954 and formal acceptance of this facility is expected next week.

Preparation for leak testing of the ANN storage tank is in progress and the test should be completed by November 2, 1954.

3) Silica Gel Treatment: Excavation for the waste liner encasement and 240-S-152 diversion box is nearing completion and pouring of the concrete encasement has started. The ten day outage of the essential materials railroad track, requested by Minor Construction for laying the encasement under the tracks, is scheduled from 8:00 a.m. on November 16, 1954 to 4:00 p.m. on November 23, 1954.

d. Project CG-587

Waste scavenging started on 9-29-54, and all work on this project is expected to be completed by November 12.

e. Project CG-588 - 4X Program

Scoping of Phase I work (Phase I does not include waste disposal, sampling nor other items under the study category) for B Plant reactivation was completed during the month and was approved by the Design Council. Scoping of several items to enhance production and operability at T Plant was completed and approved. Work defined in the scope documents, plus first cycle waste scavenging at T Plant, were included in the project proposal, which was completed and was being submitted for approval at month-end. To date purchase requisitions, totaling approximately $280,000, have been prepared and issued. Preliminary checking of B Plant equipment by plant forces is well advanced and should be completed by the end of November.

Work continued on the T Plant third extraction cycle and should be completed by November 30, 1954. Study and scoping of first cycle waste scavenging for T Plant have been completed and are to be issued for review in the immediate future.

2. Manufacturing Engineering

a. Standards

Re-engineering of the direct labor standard for the 234-5 Operations Unit has been completed and is being reviewed in preparation for publication; revision of the labor standard for the TBP Operations Unit is nearly complete; similar revisions to all

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a. Standards (Continued)

other labor standards are continuing. To develop these standards all repetitive jobs which amount to more than $500 per year in direct or applied labor are being measured. The steam standard for the 234-5 Building, revised for current air flow conditions, has been issued; the calculated steam consumption for the Redox Plant is being reviewed.

b. Work Simplification and Cost Reduction

The second Work Simplification Round Table series is 40% complete. Six conferences were held this month totaling 116 man-hours of instruction. Thirty-five operations or procedures are under study for improvement.

The Work Simplification Proposals issued during the month were:

1) A minor revision to the RAIS make-up procedure in Metal Recovery (TBP) will permit an annual savings of $1,260 in material.

2) Revisions to the briquette stamping procedure in Metal Fabrication will eliminate many hand motions and reduce direct labor slightly.

3) Revisions to ventilation in the Separations Plants will reduce steam fuel costs by an estimated $8,500 per year.

In addition, a study has been initiated to develop procedures to reduce or eliminate railroad cask car contamination.

c. Engineering Assistance

Due to the large number of failures and operational difficulties sustained with present agitator equipment, a review and re-design is being expedited to get equipment that will function satisfactorily under existing operating conditions.

All components for television equipment on the Redox crane are on order with delivery promised by November 22. Final design is awaiting delivery of component parts.

Preliminary operability tests for acceptance of the Purex ventilation system have been submitted for approval. Work was started on "Manual of Power Operated Equipment" for the Purex Facility. Details of ventilation complications involved in installing Task III, the 234-5 Building, have been worked out and advance adjustments are being made to accommodate this installation. A study was made of the operational and supervisory requirements for start-up and operation of Hot

c. Engineering Assistance (Continued)

Semi-Works. Modifications to Hoods #38-40, 231 Building, to gain ventilation control have greatly improved working conditions. Modifications to cell ventilation have decreased turbulance and its related contamination spread. The Ventilation Group is checking all buildings for changes and necessary adjustments to bring all systems up to standard for winter conditions.

d. Property Management

Disposal of the 200-W Area guard towers has been completed, and removal of the 200-E and 200-N Areas towers is proceeding satisfactorily. Decontamination of the tower searchlights, which are to be excessed, will be initiated upon completion of the tower disposal program.

Removal of the spare parts stock from the 2713-WA Building to the 2101-M Building in East Area was completed by the Stores Unit on October 21, 1954. No decision as to the final disposition of the 2713-WA Building, which is considered a fire hazard, has been made at this time.

F. Reports Issued

1. Routine

Number	Title	Author
HW-33637	Separations Section Redox Plant Sub-Section Monthly Report - October 1954	R.T. Jessen
HW-33676	Separations Section Metal Recovery Plant Sub-Section Monthly Report - October 1954	V.R. Chapman
HW-33675	Separations Section T Plant Sub-Section Monthly Report - October 1954	C.T. Groswith
HW-33704	Separations Section B Plant Sub-Section Monthly Report - October 1954	T. Prudich
HW-33671	Separations Section Z Plant Sub-Section Monthly Report - October 1954	W.N. Mobley
HW-33631	Separations Section Analytical Sub-Section Monthly Report - October 1954	L.M. Knights
HW-33604	Separations Section Radiation Monitoring Sub-Section Monthly Report - October 1954	A.R. Keene
Confidential Undoc.	Separations Section Projects & Personnel Development Sub-Section Monthly Report - October 1954	O.V. Smiset
Official Use Only	Separations Section Power & Maintenance Sub-Section Monthly Report - October 1954	C.P. Cabell
HW-33582	Monthly Progress Report - Plant Expansion Projects and Personnel Debelopment Sub-Section - Separations Section - October 1954	F.A. Hollenbach
HW-33396	Separations Section Waste Status Summary for September, 1954	D.E. Peterson

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1. Routine (Continued)

Number	Title	Author
HW-33499	Justification for T Plant First Cycle Waste Scavenging	D.E. Peterson
HW-33295	Essential Material Area Report to Cost and Purchasing, September 1 to September 30, 1954	G.E. Cooper
HW-33291	Essential Material Consumption for Redox Plant, Month of September, 1954	G.E. Cooper
HW-33290	Essential Material Consumption for TBP Plant, Month of September, 1954	G.E. Cooper
HW-33288	Essential Material Consumption for T Plant, Month of September, 1954	G.E. Cooper
HW-33665	Separations Section Essential Materials	G.E. Cooper
HW-33457	Separations Process Council Minutes	O.V. Smiset

2. Non-Routine

HW-33400	Radiation Incident, Class II, No. 82	D.R. Koberg
HW-33601	Radiation Incident, Class I, No. 389	R.N. Donelson
HW-33354	Evaluation of Recuplex Manufacturing Adaptability	F.T. Keenan
HW-33399	Reductions in Manufacturing Cycle for the Fluorination Process of the 234-5 Building	R.B. Guenther
HW-32972	Interim Report: The Circulating Gas Procedure for Coating Plutonium	C.L. Brown
Undoc.	Production of Model 190 Shapes	W.N. Mobley
HW-33458	Recommended Analytical Re-Run Limits	C.R. Anderson by T.R. Workinger
HW-33459	Waste Scavenging Cost Standards - Metal Recovery Plant	C.R. Anderson by T.R. Workinger
HW-33468	SF Accountability - TBP Plant	C.R. Anderson by R.H. Chesworth
HW-33395	Redox Process Discussion Meeting	O.F. Beaulieu
HW-33443-RD	Pre-reduction Time Cycle, Bismuth Phosphate Plants, Manufacturing Engineering Report No. 8	M. Pociluyko
HW-32553	Six-Month Post Acceptance Report, CG-550 Reactivation of 108-B Facilities	R.S. Bell
HW-32413	Introduction to Purex Manual	B.E. Clark J.J. Courtney

III PERSONNEL

A. Organization

There were no significant organization changes in the Separations Section in October.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	2	2	0
Redox Plant Sub-Section	230	229	-1
Metal Recovery Plant Sub-Section	295	280	-15
Z Plant Sub-Section	185	186	1
T Plant Sub-Section	198	205	7
B Plant Sub-Section	6	8	2
Power & Maintenance Sub-Section	320	330	10
Projects & Personnel Development	71	73	2
Analytical Sub-Section	164	160	-4
Radiation Monitoring Sub-Section	79	145	66
Section Total	1550	1618	68

C. Safety Experience

There were no major or sub-major injuries in the Separations Section in October.

D. Radiation Experience

One Class II and one Class I radiation incident occurred. These involved: (1) over-exposure of a Photography Unit employee, who received 580 mr while photographing the failed D-13 (waste receiver) tank, No. 82; and (2) uncontrolled exposure to a rigger who entered a canyon building without the required monitoring or time keeping (No. 389).

The modified 200 West Area particle decontamination program resulted in a reduction of estimated decontamination costs from $235,000 to $106,000. The badly contaminated 50 acres East of the Redox Plant were plowed and seeded with rye grass. This action, coupled with backfilling around the Redox stack greatly reduced a primary source of ground contamination within the 200 West Area.

During the latter part of the month it became evident that small particles were being deposited in an area immediately surrounding the stack. At month-end the problem had not been resolved and investigations continue.

E. Personnel Activities

1. Personnel Programs and Training

G.E. Selection Program evaluation was completed for nine Operations Unit personnel. One hundred fifty-four non-exempt personnel attended training programs which included Process and Equipment, Radiation Monitoring, Instrument, Safety and Security Orientation. Thirty-nine exempt people attended the second meeting of first line Separations Section Information meetings, 30 completed the Supervisors Safety Training program, and 6 completed Conference Leading program.

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1. Personnel Programs and Training (Continued)

Due to contemplated expansion in the Separations Section, requisitions for approximately 375 non-exempt employees were filed with Employment to staff Purex and B Plant facilities. Seven Separations Utility Operators were upgraded to Separations Process Operators to meet the immediate needs of the operating plants. Programs for receiving and training the influx of new personnel are being firmed up. Headquarters for receiving, training and holding orientation lectures has been established in the 2101 Building, 200 East Area. The problem of staffing two major separations plants in a nine months period will tax the resources of the Section. It is expected that peak manpower demands will be supplied by resorting to a six-day work week during the startup period, but the requirements for personnel will nevertheless amount to approximately 450 people.

2. Labor-Management Activities

Relations with the HAMTC continue to be satisfactory. Four grievances of a minor nature were taken to the Step 2 level by the Council and were satisfactorily resolved. Preparations were underway at month-end to discuss the training problems we will face in the near future and arrive at a program mutually acceptable to the Union and the Company.

Special discussion-type meetings concerning Union Relations matters are being held by the Union Relations representative assigned to the 200 Areas, for first line supervisors.

[redacted]

November 2, 1954

ELECTRICAL UTILITY SECTION

MONTHLY REPORT

October, 1954

ACHIEVEMENT

Operating Experience

Power Statistics (see attached sheet for details)

Plant Contract

Probable time of October Peak Demand . . 2:00 p.m. to 2:30 p.m. October 11
Probable Demand Peak for October . . . . 114,000 KW *
Comparative Demand Peak for September. . 116,179 KW
Billing Demand . . . . . 116,767 KW
Date Billing Demand Established. . . . . May 28, 1954
*As indicated by telemetering totalizer

Test Power Contract

On October 5, a peak of 50,500 KW was demanded at 100-KW. At that time demands on the 230 KV loop reached an all time high of 148,000 KW.

x x x

At approximately 5:35 p.m., October 1, equipment owned by the Bumstead-Welford Company, operating in the vicinity of the new 200-E water plant addition, hit a pole knocking the 2300 V aerial emergency feeders out of service. Inspection of the lines did not indicate any damage and breakers were reclosed. Subsequent daylight inspection did not reveal the need for repairs, however, adjustments were made to the relaying on one of the breakers. A fuse in the emergency circuit to the 282 Building was also found blown.

x x x

At 2:08 a.m., October 9, the McNary-Troutdale 230 KV line relayed out causing system frequency fluctuations for about fifteen minutes. The low point was 59.58 cycles. Trouble again occurred at 11:01 p.m. on this line with the frequency dropping to 59.5 cycles. Production was not affected in either case.

x x x

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At 9:43 a.m., October 12, power to one of the two 13.8 KV buses in 151-H substation was lost for approximately one minute while switching operations were being performed on a planned basis during an area down period. Return of power to the 1700 area circuit was delayed due to additional local switching necessary at the 184 Building. The cause was entirely due to 'human error' weakness of the man performing the switching.

x x x

The 100-K Area test power was lost for three minutes on October 14, 1954, due to the erroneous tripping of a relay while it was being checked. This loss of power occurred at 9:31 a.m.

There was no 13.8 KV equipment running at the time and the generators maintained the flow of power to the 4160 volt equipment.

x x x

Equipment Experience

While taking the 7:00 p.m. routine reading at 151-H on October 3, the substation operator noted erratic 230 KV volt meter readings. The trouble was subsequently localized at the No. 6, 230 KV, bushing on OCB 356. Critical power condition Grade "W" was set up at 10:42 p.m. and the breaker was taken out of service. The trouble was found to be due to faulty make-up of the contact at the bushing capacitor terminal. Normal conditions were restored at 11:35 p.m. without lost production.

x x x

Power to 291-U and 222-U was reported off at 1:33 p.m. on October 12. Service was restored at 2:00 p.m. High winds prevailing over previous days had loosened one of the jumper connections to the power transformer bank.

x x x

Following the completion of maintenance work on a 2300 V line in 200-E Area at 10:07 a.m., October 15, sectionalizing switches were being closed to return the line to service. One of the cutout switches blew up and started a phase to phase fault. 2300 V circuit breakers at the Power House and area substation and the 13.8 KV feeder breaker at 251 Substation opened. Power was restored in approximately two minutes, except to the feeder carrying the faulty switch. Replacement of this switch was completed at 11:30 a.m. and service was restored to normal. Subsequent check of the circuit breaker relay settings at the three locations revealed need for better coordination. In cooperation with the area electrical maintenance people, adjustments were made. Cause of the failure of the cut-out switch can only be conjectured.

x x x

At approximately 8:00 p.m. on October 22, it was noted that a line sectionalizing switch in one of the aerial 13.8 KV lines to the 181-B-C pumping plant was overheating. Load was switched to the other line and emergency repairs were completed at approximately 3:15 a.m. Low tension on the spring loaded contacts on one phase apparently caused the trouble.

x x x

Preventive maintenance testing on the five General Electric 230 KV breakers located at 151-B-C and 151-H has revealed that the resistances of the breaker contacts are above recommended operating values. Attempts will be made to improve the condition by breaking heavy applied test current. If such methods fail, it will be necessary to open the breakers and clean the contacts.

x x x

Events Influencing Costs

Section attendance performance for the month was the lowest in many months. The main contributing reasons were: a 15-day absence due to a major operation and an absence due to sickness and death in a family.

x x x

The very unusual number of adverse operating experiences during October were considered from the viewpoint of general inadequacies or indication of employee morale. However, there appears to be no relationship. Each occurred due to different reasons which could not be reasonably anticipated.

x x x

Assistance was given the Plant Accounting Unit in an inventory of the 115-KV line and substations preparatory to transfer of these facilities to BPA. The transfer date has not yet been fixed.

Operating and maintenance responsibility of the two 66-KV substations in North Richland and the short 66-KV feeder line supplying these stations will be transferred to the AEC Community Management Division's North Richland Office, effective November 1, 1954.

x x x

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Plant Development and Expansion

Power to 100-K Area for test purposes is presently being supplied over the west 230 KV leg to the KW substation. Test power to 100-KE is being exported over the 13.8 KV tie line from 100-KW. Power requirements of the 100-KE substation have not required that it be manned. Sufficient personnel for such coverage is not yet available on the plant, but is in process.

x x x

The close relationship of the construction work of CG-558 with existing operating facilities will require constant alertness and attention in order to keep system disturbances to a minimum and prevent accidents.

x x x

ORGANIZATION AND PERSONNEL

Force Summary

	Oct. 1	Oct. 31
Exempt personnel	16	16
Dispatchers	5	5
Electricians	12	12
Linemen	22	23
Substation Operators	29	29
Secretary	1	1
Stenographer	1	1
Clerk	1	1
Storekeeper	1	1
Draftsman	1	1
	89	90
Net Increase	1-replacement lineman	

Safety Experience

Two minor injuries were reported during the month. The normal average is approximately 3.

Radiation Experience

The development of a procedure for control of vehicles and personnel required to leave the main plant roads has considerably clarified our approach to problems related to overall plant radiation problems.

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ELECTRICAL UTILITY SECTION

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POWER STATISTICS
ELECTRICAL UTILITY SECTION
FOR MONTH ENDING OCTOBER 31, 1954

	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)	30220	29300	49000	47200	85.7	83.4
A-4 Out (100-D)	16750	15920	24200	23800	96.1	89.9
A-5 Out (100-H)	9950	7730	14700	15150	94.0	68.6
A-6 Out (100-F)	8520	10190	13700	14400	86.4	95.1
A-7 Out (100-KW)	4224	6720	16000	51500	36.7	17.5
A-8 Out (200 Area)	5700	5940	9600	9900	82.5	80.6
TOTAL OUT	75364	75800	127200**	161950**	82.3	62.9
MIDWAY IN	76058	76597	120800*	148000*	87.4	69.6
115 KV System						
BB1-S3 (Tie)	1566	2043	3780*	4230*	57.5	64.9
Richland	8158	9894	18880*	22400*	60.0	59.4
BB3-S4 Out (300 Area)	2080	2320	4080*	4240*	70.8	73.5
TOTAL OUT	11804	14257	26740**	30870**	61.3	62.1
66 KV System						
B9-S11 Out (100-K)	816	546	2000	1440	56.7	51.0
B7-S10 Out (W. Bluffs)	219	243	720	742	42.2	44.0
Hanford Out	28	47	300**	300**	13.0	21.1
TOTAL OUT	1063	836	3020**	2482**	48.9	45.3
HANFORD IN	1071	845	2700*	2300*	55.1	49.4
Project Total						
230 KV Out	75364	75800	127200**	161950**	82.3	62.9
115 KV Out	11804	14257	26740**	30870**	61.3	62.1
66 KV Out	1063	836	3020**	2482**	48.9	45.3
TOTAL OUT	88231	90893	156960**	195302**	78.1	62.5
230 KV In	76058	76597	120800*	148000*	87.4	69.6
115 KV Out	11804	14257	26740**	30870**	61.3	62.1
66 KV In	1071	845	2700**	2300**	55.1	49.4
(1)TOTAL IN	88933	91699	150240	181170	82.2	68.0

* Denotes Coincidental Demand
** Denotes Non-Coincidental Demand
(1) Includes 100-K metered test power

Average Power Factor - 230 KV System 89.4

MANUFACTURING DEPARTMENT
PURCHASING AND STORES SECTION
MONTHLY REPORT
SUMMARY - OCTOBER, 1954

STATISTICAL AND GENERAL

Successful bidders on the 10,400 GPM pumps and the 4500 HP motors, were DeLaval and General Electric, respectively. Quotations on both transactions are presently being reviewed by the Engineering Department. These items are for Project CG-558.

Procurement of the Vacuum Acid Fractionator for Project CG-598 was changed by the Commission from the proposed Letter Order to an attempt to negotiate a fixed price Purchase Order to cover the design only, with a formula to be used in negotiating a fixed price for the fabrication after the design is completed. Negotiations were carried on with the Lummus Co. and their proposal is being reviewed by the Engineering Department.

The vendor for the boron carbide rings for the horizontal rods on Project CG-558 has shown some improvement in production but was not able to meet promised production rates. Within the next 10 days we should know whether additional sources are necessary.

All 9 1/2" aluminum cans received which did not meet specifications are being replaced by Alcoa at no cost. Alcoa has increased production to make replacement and still meet our current requirements.

All spare parts and equipment previously warehoused in the 200 West Area have been moved to the 2101-E Building. Shelving and Palletizing of the material is complete.

Screening of material orders for Kaiser, Blaw-Knox and Associates has been discontinued with the approval of the A.E.C.

Interest shown in the auction sale of surplus material and equipment was considered very good with a total of 3200 people officially registered to inspect the material. Approximately three-fourths of the material sold had been moved out by the end of the month with a time limit of November 26, 1954.

Automotive parts previously located in the 1131 Garage and the 716 Garage have been moved to the new Transportation Facility without impeding service to the Transportation Section.

Area Stores in the 3706 and 329 Buildings in the 300 Area were closed with twice-a-day delivery from Central Stores replacing the area stores activity.

During October material and equipment valued at $10,286 were withdrawn from excess accounts for use on the Project.

Organization and Personnel	9-30-54	10-31-54	Change
Employees on Roll	282	279	-3

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
OCTOBER, 1954

The following table shows the net dollar value of business, by cost category, and the number of procurement actions placed with different types of vendors.

October, 1954

Cost Category	Government Agency	Small Business	Big Business	Educational and Other
$0 - $ 24.00	$ 24.00	$ 4,357.56	$ 1,976.71	-
$25 - $ 499.00	-	106,861.38	63,915.04	-
$500 - $ 24,999.00	-	352,430.09	322,356.73	-
$25,000 - & Up	-	87,324.00	1,186,086.00	
Total	$ 24.00	$ 550,973.03	$1,573,434.48	-
Number of Actions	1	1421	824	

Vendor Contacts	304
Damage Reports Processed	7
Over & Short Reports Processed	3
Accounts Payable Requests Handled	329
Difference Slips Processed	74
Clearance Slips & Purchase Order Change Approvals	299
Material Exception Reports	397
Return Orders Issued	190

The following is a tabulation of the activity in our utilization of Off-Plant Excess Material and Equipment Program for October, 1954.

	Items Processed	Items Received	*Value of Items Rec'd.	** Cost of Items Rec'd.	Savings to H.A.P.O.
	246	6	$ 8,463.61	$ 3,337.10	$ 5,125.51
Previous Balance	3,015	453	$155,688.15	$74,301.94	$81,386.21
Combined Totals	3,261	459	$164,150.76	$77,639.04	$86,511.72

* Acquisition cost or market value - whichever is lower.
** Includes packing and freight, where applicable.

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
OCTOBER, 1954

	G	D	Total
Requisitions on hand 10-1-54			
Operations Procurement	690	0	690
Construction Procurement	0	124	124
A.E.C. Procurement	155	58	213
Total	345	182	1027
Requisitions Assigned during Oct.			
Operations Procurement	2038	0	2038
Construction Procurement	0	315	315
A.E.C. Procurement	383	57	440
Total	2421	372	2793
Requisitions Placed during Oct.			
Operations Procurement	2061	0	2061
Construction Procurement	0	318	318
A.E.C. Procurement	342	63	405
Total	2403	381	2784
Requisitions on hand 10-31-54			
Operations Procurement	667	0	667
Construction Procurement	0	121	121
A.E.C. Procurement	196	52	248
Total	863	173	1036

Purchase Orders Placed	HW	HWC	Total
Operations Procurement	1727	0	1727
Essential Material	31	0	31
Construction Procurement		317	317
Local Purchase	32	2	34
Total	1790	319	2109

Value of Orders Placed			
Operations Procurement	$ 751,558.24	$	$ 751,558.24
Essential Material	922,744.82		922,744.82
Construction Procurement		410,595.51	410,595.51
Local Purchase	200.91	18.78	219.69
Total	$1,674,503.97	$410,614.29	$2,085,118.26

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	44	32	16	92
Essential Material	4	5		9
HWC Construction	36	20	17	73
Total	84	57	33	174

Value of Alterations	Increase	Decrease	Total
HW Operations	$16,648.72	$ 7,644.40	$ 24,293.12
Essential Material	30,762.16	27,848.13	58,610.29
HWC Construction	36,334.22	8,087.13	44,421.35
Total	$83,745.10	$43,579.66	$127,324.76

Government Transfers	OR	CRC
	0	0

Organization and Personnel	9-30-54	10-31-54	Change
Employees on Roll	21	21	0

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
OCTOBER, 1954

Successful bidders on the 10,400 GPM pumps and the 4500 HP motors, were DeLaval and General Electric, respectively. Quotations on both transactions are presently being reviewed by the Engineering Department. These items are for Project CG-558.

Procurement of the Vacuum Acid Fractionator for Project CG-598 was changed by the Commission from the proposed Letter Order to an attempt to negotiate a fixed price Purchase Order to cover the design only, with a formula to be used in negotiating a fixed price for the fabrication after the design is completed. Negotiations were carried on with the Lummus Co. and were handled by a representative from Purchasing, two representatives from Engineering and a representative of the Atomic Energy Commission. The written proposal of the Lummus Co. is being reviewed by the Engineering Department.

The Asco Sintering Co. showed some improvement in their production of boron carbide rings, but were not able to live up to promised production rates. At month end our Inspector had been able to accept 6518 rings. Every effort is, and will continue to be expended to get rings produced at an acceptable rate, but to date we have not been successful. We should know within the next week or 10 days whether we will be compelled to seek additional sources.

Sixteen aluminum extrusions for horizontal rods had been accepted by month end from the Aluminum Co. of America and no further trouble is anticipated in completing the order. Such is not the case, however, at Reynolds Metal Co. who are attempting to make the aluminum extrusions needed for horizontal rod replacements in the C-Area. Reynolds has run in excess of fourteen die trials in attempting the extrusions and claims to have spent an amount in excess of the Purchase Order price in their work to date. As the order permits cancellation after 120 days at no charge, Reynolds notified us that new dies are presently being manufactured and they will make only one more attempt at production. This trial will be made sometime after the first of November, at which time their final decision will be known.

An emergency order was placed on October 15th with Ilco Tube Bending Works for 3500 replacement pigtails for the 100-KW area. The original shipping promise was October 25th, but two changes in specifications subsequent to the placement of the order, moved the promise back to approximately November 5th. As Ilco has previously produced prototypes of the pigtails, we have every confidence in their ability to produce on time.

Federal Products Co. was the low bidder on the automatic gaging equipment for the 300 Area. Since it was difficult to determine exactly what Federal Products was offering, it was decided to accept their offer to complete the preliminary design work for a fee of $1500. This fee did not represent their full cost of the design work, but would represent our full liability in the event of cancellation prior to start of fabrication. If their design proved acceptable, the $1500 fee would be cancelled by Federal as their original quoted price included the cost of design.

The In-Line Alpha Monitor which was manufactured by Service Metal Fabricators Co. represents quite a controversial piece of equipment, as Service Metal has presented a claim for extras which will be in excess of the total amount of the original price. The amount requested is entirely out of line, although we did recognize certain extra costs they had incurred due to discrepancies in our design. Since their claim appeared to be in the realm of the fantastic, we advised them that they would have to present it in writing with a completely detailed and itemized list of extras claimed. Their claim had not arrived at month end.

Organization and Personnel	9-30-54	10-31-54	Change
Employees on Roll	29	30	1

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT

OCTOBER -- 1954

Statistical and General

The situation with regard to 9-1/2" cans being produced by Alcoa is as follows.

All cans received which did not meet specifications are being returned for replacement at no cost. Alcoa is assuming full responsibility for all charges, including the necessary re-packaging for shipment here. Their production has been increased to a level which is adequate to replace the out-of-specification material and fill our current requirements.

The search for an alternate source of cans is approaching success, in that Harvey Machine Company has submitted a quotation on an experimental lot of 100,000 cans after having previously submitted satisfactory samples. Metal Preparation Section is planning to work with the vendor to iron out the last of the production problems, which should assure a qualified second source for this material.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate -
   Supplemental contract still with the Commission for signature.

2. Nitric Acid -
   Record of Purchase covering the extension of the General Chemical Division contract still with the Commission for approval.

3. Caustic Soda -
   Supplemental contracts have been approved and are in force.

4. Sulfamic Acid -
   Contract completed and in force.

5. Ferrous Ammonium Sulfate -
   Contract completed and in force.

6. Liquid Chlorine -
   Contract written and sent to vendor for signature.

Organization and Personnel

	9-30-54	10-31-54	Change
Employees on roll	34	34	-0-

PURCHASING & STORES SECTION
STORES UNIT
OCTOBER, 1954

STATISTICAL AND GENERAL

All spare parts and equipment previously warehoused in the 200 West Area have been moved to the 2101-E Building. Shelving and palletizing of the material is complete.

A total of 111 items of electrical parts valued at about $50,000 were transferred from the Spare Parts account to the Standby account. These parts are being held for emergency repair of the 230 KV lines.

A total of 624 items were added to the Spare Parts and Equipment accounts.

Receipts of operational spare parts from Kaiser Engineers and Blaw-Know is continuing. However, the bulk of these items are still awaiting transfer.

Screening of material orders for Kaiser, Blaw-Knox and Associates has been discontinued with the approval of the A.E.C.

Interest shown in the auction sale of surplus material and equipment was considered very good with a total of 3200 people officially registered to inspect the material. Approximately three-fourths of the material sold had been moved out by the end of the month with a time limit of November 26, 1954.

Automotive parts previously located in the 1131 Garage and the 716 Garage have been moved to the new Transportation Facility without impeding service to the Transportation Section.

Area Stores in the 3706 and 329 Buildings in the 300 Area were closed with twice-a-day delivery from Central Stores replacing the area stores activity.

In the Excess Material and Equipment Accounts the following items are reported:

Disbursements by store order	$ 10,286
Offsite shipments	216,644
Receipts	72,569

Organization and Personnel	9-30-54	10-31-54	Change
Employees on Roll	185	181	-4

PURCHASING & STORES SECTION

TRAFFIC UNIT

October, 1954

STATISTICAL AND GENERAL

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of October amounting to $1,794.34. This makes a total savings from September 1, 1946, to date of $1,777,143.62.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for October, 1954	Savings from 9-1-46 thru September, 1954	Savings from 9-1-46 to date
Aluminum Sulphate (Liquid)	Portland, Ore.	$ 480.79		
Caustic Potash	Pittsburg, Cal.	341.21		
Machinery	Oakland, Cal.	58.92		
Sulfamic Acid	Grasselli, N.J.	913.42		
		$1,794.34	$1,775,349.28	$1,777,143.62
2. Freight Bill Audit		1,059.86	130,775.61	131,835.47
3. Loss & Damage and Overcharge Claims		453.08	139,121.97	139,575.05
4. Ticket Refund Claims		143.68	42,611.04	42,754.72
5. Household Goods Claims		—	17,641.85	17,641.85
		$3,450.96	$2,105,499.75	$2,108,950.71

Work Volume Report

Completed Travel Requests		142
Reservations resulting from above:	Rail	82
	Air	190
	Hotel	209
Expense Accounts Checked		187
Household Goods & Automobiles	Movements Arranged Inbound	4
	Movements Arranged Outbound	3
	Insurance Riders Issued	1
Ticket Refund Claims	Filed	6
	Collected - Number	11
	Collected - Amount	$143.68
Freight Claims	Filed	12
	Collected - Number	5
	Collected - Amount	$453.08

PURCHASING & STORES SECTION
TRAFFIC UNIT
October, 1954

Work Volume Report (cont.)

Freight Claims (cont.)	Over and Shorts Processed	21
	Damage Reports Processed	17
Freight Bill Audit Savings		$1,059.86
Freight Shipments Traced		48
Quotations	Freight Rates	309
	Routes	232
Bills Approved	Air Freight	2
	Air Express	14
	Carloading	185
	Express	95
	Rail	1,034
	Truck	240
Carload Shipments	Inbound	1,133
	Outbound	0

Report of Carloads Received

Commodity	CMS TP&P	NP	UP	TOTAL
Alumina Sulfate (liquid)	2	1	1	4
Aluminum Ingots			1	1
Aluminum Sulfate (dry)	2	3	3	8
Aluminum Tubing		1		1
Anti-Freeze			4	4
Asphalt (liquid)	2			2
Caustic Soda	13	12	18	43
Chlorine	2	1	2	5
Coal	318	144	540	1,002
Drums (used)		1		1
Wooden Pallets			1	1
Lime			3	3
Machinery & Parts			1	1
Machinery		1	1	2
Methanol		1		1
Methyl Isobutyl Ketone			1	1
Nickel Sulphate		1		1
Nitric Acid		12	16	28
Paint			1	1
Phosphoric Acid		1	1	2
Potash (flake)			1	1
Salt		1	2	3
Soda ash	1	4		5

PURCHASING & STORES SECTION
TRAFFIC UNIT
OCTOBER, 1954

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	TOTAL
Sodium Nitrate			1	1
Steel Angles & Plate		1		1
Sulfamic Acid			1	1
Sulphuric Acid	1			1
Merchandise & Stop Cars	1	4	3	8
Total	342	189	602	1,133

Organization & Personnel	9-30-54	10-31-54	Change
	9	9	0

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TRANSPORTATION SECTION
MONTHLY REPORT
October 1954

Transportation Section personnel forces increased from 489 to 490 by one new-hire, two transfers in, and two transfers out.

Construction of the new Consolidated Transportation Facility was completed during the month subject to relatively minor corrections. The heating system has not as yet operated satisfactorily and seems to be the most serious problem. The remaining exceptions should be completed by contractor personnel in about two weeks. Occupancy of the new facility was begun on October 21 and is virtually complete. All major functions were being performed from the new headquarters at month end although considerable work connected with the move remains to be completed.

Completed the revision of payroll suffixes, cost codes, routine work orders, and expense codes connected with the transfer of the Transportation Section to the Manufacturing Department.

Attended a meeting on October 12 with budget representatives of the Manufacturing Department. General instructions have been received for the FY 1955 Midyear Review along with schedules for personnel, overtime, equipment not included in construction projects, and materials. Key budget assumptions are not yet available and this has stymied most activity. This will have the general effect of tightening all due dates.

Preparatory arrangements have been completed with the Inventory Accounting Unit on the physical inventory of Road Materials (0420-930) scheduled for November 4.

Attended a meeting on October 25 at H. A. Carlberg's office with financial and landlord representatives to discuss accounting and reporting practices on landlord properties. Additional information is to be developed for issuance in Manufacturing Department Guides.

Attended a meeting on October 27 with representatives of the Transportation Section and the Stores Unit to discuss spare parts and related items. The following is a concise summary covering major points:

a. Free issue materials.

   Most materials are to be transferred into Stores inventories. A working supply of the remaining free issue materials is to be maintained in the shops and replenished from the stockroom by Stores personnel.

b. Handling of special shop tools.

   Stores is to be given reasonable compensation following a time study.

c. Preparation of store orders.

   Garage Foremen are to complete the quantity, description, cost coding, and signature. Stores personnel will fill in the part number and inventory credit.

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Transportation Section

d. Escort service.

Stores will furnish escort service for all outside personnel having need to enter the stockroom.

e. Transfer of railroad parts.

Railroad parts from Riverland are to be transferred on SMT's from 0420-932 to 0420-58 concurrent with movement to the new Consolidated Transportation Facility.

The Atomic Energy Commission has discontinued the policy of holding equipment for future construction programs. All equipment will now become available for possible upgrading or to satisfy additional requirements. The Commission has also advised that an allotment of thirty replacement sedans, as scheduled in the FY 1955 Equipment Budget, has been received. A Request for Appropriation is being prepared for the procurement of these units.

Commercial rail traffic during October increased by 138 cars or 6.03% over September as coal receipts were somewhat higher. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	1052	16	13	1061
AEC	87	2	2	74
AEC - Kaiser (cement)	8	0	0	9
Blaw Knox	28	2	0	26
L. H. Hoffman	3	0	0	3
L. A. Hopkins	0	0	0	1
Kaiser Engineers	4	0	0	4
U. S. Army	17	0	0	15
	1,199	20	15	1,193

Railroad process service during October increased by eight cars or 7.27% over September and required 452 overtime hours.

Total car movements including process service totaled 2,763 in October compared to 2,649 in September, 2,293 in August, 1,361 in July, 2,667 in June, 3,110 in May, 2,267 in April, 2,482 in March, 2,624 in February and 2,545 in January.

Locomotive 39-3725 was released on October 20 after being tied up at the 221-T Building for nine days by contamination.

The Plant Bus System transported 1.31% fewer passengers in October than in September. The following statistics indicate the magnitude of service rendered:

Passenger volume	141,365
Revenue - bus fares	$ 7,068.27
Earnings - transit advertising (September)	$ 104.67
Bus Trips	6,492
Bus miles - passenger carrying	182,704
Passenger miles	4,584,845

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Transportation Section

The Plant Bus System began operating from the new terminal at the Consolidated Transportation Facility on October 30. Minor revisions in routes, stops, and schedules were effected at that time.

Special on-plant bus service was provided from October 1 through October 10 for the auction of excess material.

Special bus transportation was provided on October 1 for a tour of the Plant Areas by visiting officials of the General Electric Company and on October 4 for the Northwest Power Study Group.

The Richland Bus System transported 7.06% more passengers in October than in September. The increase in patronage is largely attributable to seasonal factors. The following statistics indicate the volume of service rendered:

Total passengers including transfers	10,586
Revenue - bus fares	$ 676.70
Earnings - transit advertising (September)	$ 4.76
Bus trips	1,149
Bus miles - passenger carrying	6,090
Passenger miles	28,725

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 130 which were rendered to the following locations:

Benton City, Washington	5
Grandview, Washington	3
Hinkle, Oregon	10
Kennewick, Washington	19
Pasco, Washington	58
Pendleton, Oregon	8
Prosser, Washington	3
Spokane, Washington	2
Sunnyside, Washington	7
Walla Walla, Washington	4
West Richland, Washington	7
Yakima, Washington	4

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

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	32,960	22,390	8,900	2,180	150
Received during month	93,486	12,700	26,000	2,560	0
Dispensed during month	98,346	20,950	26,900	2,360	20
Stock at end of month	28,100	14,140	8,000	2,380	130

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Transportation Section

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

Motor Overhauls	33
Class A Inspections and Repairs	122
Class B Inspections and Lubrications	1043
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	75
Semi-Monthly Inspections - Buses	147
Monthly Inspections - Railroad Rolling Stock	10
Other Routine Maintenance Repairs and Service Calls	1850
Accident Repairs and Paint Jobs	32
Tire Repairs	438
Wash Jobs	420
Vehicles Decontaminated	50
	4,220 *

*The number of repair jobs performed was approximately 10% below normal because of time devoted to moving into the new Consolidated Transportation Facility.

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

Code	Type	No. of Units	Total Mileage
1A	Sedans	338	610,219
1B	Buses	103	236,082
1C	Pickup Trucks	464	255,095
1D	Panel, Carryall, Station Wagon	162	159,137
1G	Jeeps	2	824
1H	Power Wagons	50	26,547
1J	Armored Cars	2	2
68 Series	Trucks	222	88,894
		1,343	1,376,800

Discontinued the seasonal repair of lawn mowers for Community.

The winterizing of HO equipment which was begun on September 20 is virtually complete.

Approximately 2,000,000 pounds of material and equipment have been loaded on trucks and railroad cars and 200 vehicles were moved to pickup points following the auction. Approximately 1,400 man-hours and 500 equipment hours were required during October in the disposal of about 50% of the material.

The program of decontaminating grounds in the 200-West Area continued in progress with the plowing of 100 acres; seeding and cultivating 40 acres; covering two acres with 1,500 cubic yards of stabilizing material; and seal coating of three miles of surfaced roadway requiring 10,000 gallons of asphaltic material and 500 cubic yards of mineral aggregate.

The Fall weed control program was begun during October. This will include the spraying of designated locations in the 700, 1100, 3000, and 300 Areas, Electrical Substations, and roadway shoulders with a soil sterilizing chemical to prevent seed germination.

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Transportation Section

A new delivery service was established to the 300 Area for Stores material during the month. This service provides two deliveries and store order pickups daily for each building.

Maintenance of primary roads required 491 man-hours; walkways, parking facilities and other ground maintenance in the manufacturing areas required 339 man-hours.

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

	MC 3	MC 5
Stock at start of month	40.7	4.4
Received during month	38	38.49
Used during month	34.5	16.
Stock at end of month	44.2	26.89

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

	3/4" to 0 Pre-mix Tons	¼" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	261	124	1,572	1,629	1,161
Made during month	488	253	270	0	0
Used during month	663	153	259	203	311
Stock at end of month	86	224	1,583	1,426	850

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ENGINEERING DEPARTMENT

OCTOBER 1954

TECHNICAL SECTION

The recent high canning rejection rates of 20 percent to 90 percent due to porosity of the Al-Si braze of slugs from rods heat treated in carbonate salt in the new submerged electrode furnace at Fernald have been substantially reduced by a six-minute outgassing of individual slug cores in a chloride salt bath at 600-620 C. By approximating in the new furnace as nearly as possible the heat treating conditions associated with the previous Fernald furnace, the porosity encountered during the canning of uranium has been reduced, but is still of such a magnitude to require the slug outgassing as described. The higher hydrogen content of uranium cores which is the cause of the porosity is believed at least in part to be caused by a high water or dissociated water content of the carbonate salt bath in the new Fernald furnace. Process studies and accompanying laboratory investigations are being actively pursued to determine a heat treating and processing scheme to reduce the hydrogen content and therefore the Al-Si braze porosity in an assured manner.

One hundred and seven hot pressed canned, nickel-plated, externally cooled only, cored fuel elements were charged in C Pile on September 29. One tube exposed to 600 MWD/T will be discharged shortly after the first of the year. Somewhat over 100 hot pressed, nickel-plated, internally and externally cooled fuel elements are currently being processed for pile charging.

A total of 192 four-inch unbonded and 192 four-inch mechanically bonded elements have been made by the cold pressure-weld canning method for production test irradiation. These slugs should be charged in the piles the middle of November.

Approximately 600 fuel elements have been canned unbonded using the "C" process with a fusion weld. These also should be charged in the piles the middle of November.

During the month, slug ruptures occurred in seventeen H Pile tubes in an area ten rows high and eleven rows wide. A high density of ruptures and near ruptures was found in individual tubes. A localized hot spot of short duration most probably occurred during a rapid start-up. There was no correlation with metal type. Tubes have been pushed to minimize further incidents.

Two tubes of cored uranium slugs under test at C Pile have now reached 375-400 MWD/T. Plans are under way to charge four tubes of extruded cored slugs at C Pile.

Thorium irradiations now consist of 148 J-Q columns in H Pile and 160 columns at C Pile.

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Decontamination of the uranium product stream in the Redox Plant was impaired by entrainment in the second and third cycle columns. As a consequence only that uranium which passed through silica gel beds met specifications with respect to gamma activity. Extensive laboratory studies conducted by Process Chemistry on plant streams have demonstrated that solids are contributing to the emulsion condition and the resultant entrainment of activity. Correction of the immediate plant problem via the periodic removal of accumulated solids in the interface region by jet transfer is scheduled for testing. Less cumbersome methods directed toward continuous removal of solids and aqueous material from the uranium containing organic stream are being studied from a process and operational and installation viewpoint. Plutonium decontamination and waste losses of plutonium and uranium have continued to reflect excellent performance of most of the process system.

Scavenging of the Waste Metal Recovery Plant aqueous waste stream with nickel ferrocyanide, inaugurated last month, has allowed the routine cribbing of over 25,000 gallons of waste volume for each ton of new uranium processed. A flowsheet has been prepared for treatment of wastes stored previous to the start of scavenging.

Shift operations were started in the Hot Semiworks on October 18 in preparation for the start-up of the Purex-process test program. Conversion of the facility from the Redox equipment is over 98 percent complete.

The fission product activity retention in used TBP Process solvent appears to be caused by reaction products of the diluent rather than by degradation products of tributyl phosphate as has been previously supposed. Treatment of shell diluent with nitric acid produces nitro, nitrate ester and acid fractions, apparently identical with products found in used plant RCW, which when added to clean, simulated plant streams duplicate observed plant difficulties in respect to high fission product activity hold-up, foaming during UNH calcination, unfavorable uranium distribution ratios and failure to respond to sodium carbonate washing. The reactions are accelerated by nitrous acid and inhibited by urea. The implications in regard to specifications for hydrocarbon diluent and possible advantages of a carbon titrachloride diluent are significant.

Addition of nitrite appears to effectively suppress ruthenium distillation during recovery of nitric acid from Purex aqueous wastes.

Laboratory experiments indicate that sparging with ozone during calcination of UNH to UO_3 will increase the decontamination factor for ruthenium from about 10 to about 30.

Eighty-one production line slugs were selected at random and subjected to X-ray analysis. A substantial number possessed pronounced (100) type preferred orientation, which in many cases varied across the radius of the fuel element. Under these conditions dimensional instability under irradiation may be predicted--specifically, a shortening in length and increase in diameter, modified to a "dished" contour in the cases where orientation values for (100) planes are greater at the center than at the periphery of the slug. All of the slugs examined had been beta heat-treated in rod form.

The three unruptured cored IKE slugs which were discharged with a similar ruptured specimen on July 5 after about 1500 MWD/T exposure have been examined. These slugs, originally AlSi canned, were essentially unbonded; cracks, starting at the core, extended nearly to the periphery; although minor deformation of the core profile occurred no appreciable dimensional changes from uranium growth were observed; and hardness traverses did not exclude the possibility that beta phase temperatures were reached in the centers of the slugs.

DESIGN SECTION

Distribution of Design Section effort for the month was as follows: 27.2% to Design Development, 17.7% to the 1952 Hanford Expansion Program; 18.7% to Reactor Plant Modification for Increased Production; 5.9% to the 4-X Program, and 30.5% to other projects and design orders. Significant changes from the previous month include a reduction in design development effort, which is reflected in acceleration of the 4-X Program plus priority attention to other projects and design orders, including 1706 KE Recirculation Facilities.

Total design for Project CG-558, Reactor Plant Modification for Increased Production advanced to 42.6%. Scope design is 91% complete and detail design was advanced 4.3% during the month to 37.4% complete. Design necessary for equipment installation during the first shutdown for replacement of horizontal rods and thimbles and for replacement pressure gages has been completed. Work is nearing completion on the preparation of Project Proposal, Revision 4, incorporating the revised scope of work in accordance with Modifications 5 and 6 of Directive HW-309. The current design estimate for CG-558 is $1,400,000.

Activity on the 4-X Program is continuing on a priority basis. Scope design for Phase I of B & T Plants is 65% complete and detail design is approximately 7% complete. The design criteria for B Plant reactivation are being resubmitted to AEC for approval, incorporating minor changes as agreed with AEC. The Project Proposal, CG-603, incorporating all the work at the Bismuth Phosphate Plants into one project, was completed. Preliminary scope activity continued on Metal Conversion and 300 Area 4-X facilities, with principal stress on studying alternates for the UO_3 Plant capacity increases.

Detail design for 1706-KE Recirculation Facilities was expedited during the month to enable the start-up of construction on the building structure November 1, 1955. The structural drawings were completed and site excavation was started. Total design advanced 22% to 62% complete.

Separation design development activity included the completion of the BPX study for coupling of the B Plant with the TBP Plant and a feasibility report was issued to management for consideration. A Bitrex study was started to analyze the feasibility of coupling the B & T Plants to Redox.

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PROJECT SECTION

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

Project No.	Title	Completion Scheduled	Completion Actual
CG-496	Recuplex	86%	84%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	99.5
	Reactor and Building	100	99.6
	KE - Water Plant	100	94.4
	Reactor and Building	100	92
	General Facilities	100	94.2
CA-513	Purex Facilities, Part "A"	94	79
	Part "D"	100	99
CA-514	300 Area Expansion	68	72
CG-535	Redox Capacity Increase, Phase II	85	81
CA-546	Fuel Element Pilot Plant	54	55

By completion of 353 orders, Inspection reduced the total number of orders requiring inspection to 558, a decrease of 28%. This total included 104 new orders which require inspection.

At 2101-M Building, fabrication of graphite for the Physical Constants Test Reactor was above 95% complete. Mock-up was started on October 28.

Overall completion of the 76 Acceptance Tests was about 65% for 105-KW Reactor. For the KW Water Plant the major portions of Acceptance Tests were completed, although only two had been completed and approved. An unofficial inspection of the KW Water Plant buildings was made, and the list of several hundred incomplete items was discussed with the AEC engineer. One-half of the KE Water Plant was in operating condition, and controls are being completed for the other half. Correction of architectural and structural punch list items for 105-KW Building was about 50% complete. In 105-KE Building, the storage basin monorail was completed with minor exceptions. All steam lines have been tested and flushed. All 105-KE nozzles were installed, including 200 silicone-treated outlet nozzles. Acceptance testing began on the Solids Feed System and the pneumatic test of crossheaders, nozzles, and tubes. A.T.P. 1292, Gas Circulation System in 115-KE, has been completed without exception.

Construction of 202-A Building was estimated at 76.8% complete. Welding in the Hot Pipe Trench was essentially completed, and punch list items are being cleared. Installation of pipe jumpers began in Cell "D," and 26 were completed. Fabrication of jumpers progressed to 724 welded, 590 framed and balances, and 560 tested. Amercoat painting was completed through Cell "F," and painting was completed in the Decontamination Cell, Pool Cell, and Slug Storage Basin. Installation of ductwork throughout 202-A was 81% complete, and heating and ventilation systems were 78% complete. Major equipment installations included five Gallery tanks, three Organic Storage Tanks and one centrifuge, and pumps and agitators in the Galleries.

Calibration of instruments in the Central Control Room progressed to about 50% complete. The 284-E Power Plant Addition was completed, and the 283-E Filter Plant Addition progressed to the stage of clearing punch list items. At 241-A Tank Farm, concrete domes were finished on tanks #101, 102, and 105. Area backfilling was about 75% complete. A contract has been let for new work in the 241-A Tank Farm.

ADVANCE ENGINEERING SECTION

Calculation of isotope yields for homogeneous uranium-thorium alloy slugs, as described last month, was completed and the results were compared with the results of earlier calculations by Applied Research on thorium slugs with a Uranium-235 jacket. The strongly absorbent uranium jacket shields the newly formed uranium-233 from neutrons and the rate of burn-out of U-233 is less rapid in jacketed slugs; this effect suggests that jacketed slugs might be superior for Uranium-233 production. However, this reduced burn-out of Uranium-233 causes substantial losses of reactivity which are much less severe in the case of the homogeneous slug; hence, it is indicated that the homogeneous slug would be preferable in a power breeder operating on re-cycled Uranium-233.

ORGANIZATION AND PERSONNEL

Total on Roll, October 1, 1954	1,477
Accessions	28
Separations	23
Total on Roll, October 30, 1954	1,482

J. R. Wolcott was transferred to the Special Study project during the month, and A. B. Carson of the Technical Section was appointed to take his place as Head, Reactor Design and Development Unit. Effective October 15 and with the dissolution of the Plant Auxiliary Operations Department the statistical function was transferred to the Engineering Administration Section, with L. G. Waters as head of the Statistical Unit.

R. J. Schiewe,
for A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SECTION

OCTOBER 1954

The Hanford Operations Office has approved the disposal of surplus technical journals through the United States Book Exchange. This procedure is in accordance with the recommendations of the AEC Technical Information Panel and has the approval of the General Services Administration. Credit is given for all items sent to the Exchange and items needed will be secured from the Exchange against these credits. This provides an opportunity to secure a return on property which is of little value when disposed of in accordance with the usual procedures for the disposal of surplus materials.

In connection with the 30-day inventories, arrangements were recently worked out with IBM to supply an inventory listing of a small segment of the Classified Files holdings during each 30-day interval. 588 copies of documents in the HW 18,000 series were inventoried during the period in connection with this program. All copies were satisfactorily accounted for.

An outline of a tentative classification guide for HAPO was commenced during the month. The initial objective is to obtain a subject breakdown of Hanford activities. When this has been agreed upon by all Departments, the assignment of appropriate classifications will be undertaken. Responsibility for preparing outlines on topics was assigned to members of Abstracting and Bibliography. It is anticipated that the initial outline can be completed in two to three months.

During the month the following major contract activities were handled:

1. Lease Agreement No. L-2 between General Electric and the Richland Softball Association was approved by the Commission the last day of October 1954 and was forwarded to Richland Softball Association for final execution.

2. Modification No. 1 to Consultant Agreement No. 116 between General Electric and Dr. George Watt covering an extension of time of the agreement has been approved by the Commission and conformed copies were distributed October 11.

3. Special Agreement No. G-49 between General Electric and the University of California at Los Angeles covering the use of University-owned seam welder which was sent to the University for execution September 20 is still pending action of the University. Inquiry made at the University revealed that they had returned the document for revision but the document has apparently been lost in transit. Additional copies of the agreement will be reprocessed for execution, incorporating changes desired by the University.

4. Bids on the printing of Hanford Works Official Telephone Directory were received October 20, 1954. The Columbia Basin News of Pasco

was the apparent low bidder. One exception to the specifications in bidding on a different type style than was specified was taken. Since the use of the type style proposed is acceptable to the Telephone Unit, a recommendation of award will be prepared for submission to the AEC.

5. Special Agreement No. G-51 between General Electric and Haughton Elevator Company providing for the modification of "C" elevators in 100-B, D and F Areas was sent to the Commission October 25.

6. Modification No. 1 to Consultant Agreement No. 122 between General Electric and Stanford Research Institute providing for an extension of time of the agreement was executed by the Institute October 1.

R. J. Schier

R. J. SCHIER, MANAGER
ENGINEERING ADMINISTRATION SECTION

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PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

OCTOBER - 1954

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VISITORS AND BUSINESS TRIPS

T. J. E. Glasson visited here from Knolls Atomic Power Laboratory, Schenectady, New York, October 4 and 5, to discuss KAPL-120 loop.

D. H. Cornell, T. J. E. Glasson, and K. J. Krystyan visited here from Knolls Atomic Power Laboratory, Schenectady, New York, October 20 and 21, for consultations on KAPL-120 loop.

E. Lamb visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 19, to discuss specifications for CO and BE_3N_2 canned for irradiation at Hanford.

R. W. Coyle and R. R. Lee visited here from GE-ANP in Cincinnati, Ohio, October 7 and 8, to discuss availability of irradiation facilities.

D. M. Wilsey is here August 31 through December 31 from Knolls Atomic Power Laboratory, Schenectady, New York, for consultations on KAPL-120 loop.

J. A. Berberet and W. H. Clark visited the ANP Plant at Arco, Idaho, October 25 and 26, to discuss proposed ANP irradiations.

M. W. Carbon and W. F. Ekern visited Brookhaven National Laboratory, Upton, Long Island, New York, October 18 through 20, to present papers at an information meeting.

M. V. Davis, R. O. Gumprecht, and W. E. Niemuth visited Argonne National Laboratory, Lemont, Illinois, October 11 and 12, to discuss reactivity measurements, and then attended a Physics Symposium at Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 13 through 15.

J. H. Rector has been at the Asco Sintering Company, Los Angeles, California, since September 7, for consultations on fabrication of boron carbide rings, and is expected to return during November.

ORGANIZATION AND PERSONNEL

	September	October
Administrative	5	5
Pile Development	62	60
Pile Engineering	74	72
Special Irradiations	25	25
Technical Liaison	6	5
Total	172	167

Pile Development: One Group Head transferred to Pile Engineering Unit, one Physicist II terminated, and one Technical Graduate was converted to Junior Engineer.

Pile Engineering: One Group Head transferred in from Pile Development Unit, one Technical Graduate - Rotational transferred in from Operations Analysis, one Engineering Assistant 17 was reactivated from military service, one Group Head transferred to Applied Research Sub-Section, one Technical Graduate transferred to Project-Inspection, and one Engineer II, one Junior Engineer, and one Engineering Assistant 12 terminated.

Technical Liaison: One Physicist transferred to Design-Process Engineering.

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PROCESS TECHNOLOGY

Power Level Limits

During October the power levels of the D, DR, and H Piles continued to be limited by a maximum tube outlet temperature of 95 C. Until the middle of the month, the power levels of the C and F Piles were similarly limited by 95 C and that of the B Pile by 100 C. The limits at these three piles were then raised 5 C. The new "trip-before-instability" tube boiling limits are now near to being limiting at the B Pile. Also, throughout the month, power levels of the C Pile were limited by low reactivity imposed by selected graphite temperature helium concentration. The limitation is correctable by addition of more enrichment.

Process Changes

Three revised Process Specifications - Reactor Process were approved. Specification 2.00 and 32.00 were made applicable to the K Piles. Specification 11.00 caused "trip-before-boiling" tube boiling limits to be replaced by the new "trip-before-instability' limits.

Slug Ruptures Except for Those in the H Pile

At D Pile a rupture occurred in a wafer slug charged under PT 105-514-SI. The jacket wall was split indicating the possibility that one of the uranium wafers had split, tearing the jacket.

Al-U^{235} Alloy Slug Failures

Ruptured "J" metal pieces were discharged from five tubes at DR Pile. All five ruptured pieces exhibited cracks in the jacket wall.

Slug Ruptures at the H Pile

During the month slug ruptures occurred in 17 H Pile tubes in an area, ten rows high and eleven rows wide. A high density of ruptures and near ruptures was found in individual tubes.

The probable cause for the outbreak is concluded to be from unusual operating conditions. A localized hot-spot of short duration most probably occurred during a rapid startup. The conclusion is supported by (a) the fact that the ruptures are located in a localized region of the pile, (b) a lack of correlation between rupture and/or near rupture and metal type, and (c) information indicating the possible occurrence of such an event during at least one startup.

To prevent further rupture in the region, tubes have been pushed as knowledge of the extent of the damaged region has been obtained by (a) location of the ruptures, and (b) examination of metal discharged from tubes.

A determination of whether tube pushes have completely eliminated the defective region can only be gained through further operation.

Shutdown Water Flow Stoppage at the H Pile

Because of an operational error the flow of cooling water through tube rows 27 and 28 was stopped for a period of about 2-1/2 hours after shutdown but while considerable heat generation was occurring. This occurred from a failure to valve properly on the rear face. The correct sequence of valving operations are routine and are standard procedure. From heat transfer calculations the maximum slug temperature reached about 425 C and maximum process tube temperatures about 250 C during the incident.

After analysis of the problem, it was concluded that no serious damage to the slugs had occurred on the basis of: (a) visual examination of slugs discharged from a region on header 27 which should have experienced maximum conditions, (b) successful backseating of charges in all tubes on header 27, and (c) consideration of likely corrosion and metallurgical effects expected from the time-temperature conditions imposed on the slugs.

It was concluded that no serious damage had occurred to the process tubes on the basis of: (a) successful pressure testing of all tubes on the header to 400 psi, (b) successful pressure testing of 2770-H to 600 psi, and (c) consideration of possible loss of mechanical strength expected from the time-pressure-temperature conditions imposed on the tubes.

On the basis of these findings, operation was resumed with no slug discharge or process tube replacement because of the incident. In seven days of operation since the incident no difficulties have arisen because of the incident.

Irradiation of New Fuel Slugs

Cored Slugs - Production Test 105-570-A - This production test authorizes the irradiation to failure of 4 tubes of cored-uranium lead-dip slugs and 4 tubes of standard control slugs at both high and lower tube powers. Four tubes charged at C Pile have operated for three months (375-400 MWD/T) without incident. The four tubes charged in F Pile September 14, have reached 140-185 MWD/T without incident.

Mechanically Bonded Slugs - Point Pressure Closure - Production Test 105-575-A - Two tubes each containing two four-inch, mechanically-bonded, point-pressure-welded slugs centered with normal uranium pieces were charged in D Pile. One tube scheduled for 200 MWD/T has been discharged. Preliminary examination indicates that the slugs are in very satisfactory condition. The remaining tube, scheduled for 600 MWD/T is currently at 360 MWD/T.

Powder Metallurgy Slugs - Production Test 105-576-A - This test authorizes the exposure of 5 control tubes at C Pile, 10 control tubes at F Pile, and about 40 supplementary tubes in F Pile. Two ruptures will be incurred in C Pile, and all slugs in F Pile will be discharged at normal goal exposure, 675-775 MWD/T. The C Pile tubes were charged September 16 and have reached 140-150 MWD/T. The F Pile tubes are scheduled for charging November 8.

Unbonded Slugs - Production Test 105-578-A - This production test authorizes the irradiation to failure of "C"-process-canned solid and cored uranium slugs, and of nickel plated "C"-process-canned solid uranium slugs. A total of sixteen tubes will be charged, and six of these will be irradiated to rupture. The slugs are being canned and will be charged late in November.

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Hot-Press-Canned Slugs - Production Test 105-577-A - This production test authorizes the irradiation of solid slugs with fusion and diffusion welds, cored slugs with fusion welds, and control slugs. Fifteen tubes were charged, and four of these will be irradiated to rupture. Current exposure is about 200 MWD/T.

Unbonded Slugs - Point Pressure Closure - Production Test 105-580-A - A total of 8 four-inch pieces, spaced with normal slugs, were charged in three tubes during September and are to be irradiated to 200, 400 and 675 MWD/T for metallurgical examination. A fourth tube, containing 4 unbonded cored enriched pieces centered by 18 unbonded cored pieces and solid aluminum dummies will be charged later in November and irradiated to rupture.

Development Tests 105-582-A, 105-581-A, and 105-592-A, Irradiation of IQS-7, 8, and 9 Metal - These tests have been approved and authorize the irradiation and special pickup of a total of 16 tubes in H Pile. The metal under these tests came from rods which were rolled from ingots which differed slightly from the ingots from which standard production metal rods are rolled. Pre- and post-irradiation measurements will be obtained. No ruptures are anticipated.

Unbonded and Mechanically Bonded Point-Closure Slugs - Production Test 105-584-A - A production test to authorize irradiation of unbonded and mechanically bonded point-closed slugs has been written and is circulating for approval. Lead-dip control slugs will also be irradiated for comparison. Three tubes of each of three slug-types will be charged. Irradiation will continue until one rupture has occurred in each of the three types of metal. Charging is planned for late November.

Production Quantities of Cored Slugs - Production Test 105-591-A - Approval is being requested for this test which has been written to authorize the charging and irradiation of production quantities of cored slugs (both extruded and drilled) until 100 and 300 Area process specifications have been issued. The first slugs, arriving in October, may be charged in November.

Irradiation of Extruded Cored Slugs - Evaluate Process Development - Development Test 105-588-A - Approval has been received for this test which authorizes charging three control tubes for metallurgical inspection from each month's supply of cored slugs received at HAPO during the development period of cored slug production. One tube of extruded cored slugs already available for charging is also authorized. Equal numbers of drilled cored slugs, when available, will be charged in the same tubes. Exposure will be limited to 900 MWD/T and no slug failures are expected.

Irradiation of Extruded Cored Slugs - Test Ultimate Performance by Irradiation to Rupture - Production Test 105-590-A - This test has been proposed and is being written. Four tubes of extruded cored slugs and four tubes of standard production metal will be charged in C Pile. Irradiation will continue until both types of metal experience two ruptures.

Uranium Silicon Alloy - Production Test 105-586-A - Approval is being requested for this test which authorizes the irradiation of silicon alloy solid slugs from ingots (1 tube) and from Dingots (4 tubes) also silicon alloy cored slugs (3 tubes). The four tubes from Dingot stock will be irradiated until two ruptures occur. Standard production metal (4 tubes - 2 ruptures) will serve as control. The cored slugs will be irradiated to 900 MWD/T.

Internally and Externally Cooled Slugs - Production Test 105-587-A - This test has been proposed and is being written to authorize irradiation of 7 tubes of I and E slugs in C Pile. Three tubes will be discharged at exposures up to 900 MWD/T. Four tubes will be irradiated until 2 ruptures occur. Standard production metal (4 tubes - 2 ruptures) will serve as control. It is planned to measure outlet water temperatures in the core and in the annulus.

Manufacture of Other Products

Preliminary Irradiation of J-Q Columns - Production Test 105-567-A - The third scheduled discharge of one column from the H Pile J-Q block loading will be made soon at about 110 MWD/tube.

A second revision to the exposure plans for the remaining eleven columns is necessary to meet AEC requirements, and Supplement A (revised) will be issued in November. It is planned that ten tubes will be exposed to about 175 MWD/tube.

Quantity Irradiation of J-Q Columns - Production Test 105-579-A - There are now 148 J-Q columns in H Pile and 160 J-Q columns in C Pile under this test. Exposure revisions at the request of the Commission have resulted in many changes to the original test and Supplement A. These will be recalled and replaced by a revised test during November.

High Exposure Thorium - Production Test 105-551-A - This test has been discharged and the final report has been written (HW-33324). Data on heat generation versus exposure for thorium slugs are given in the report. The report concludes that B process canning is unsatisfactory for high exposure thorium.

PILE PHYSICS

KW Pile Startup Program Planning

Crews have been selected for the KW startup tests, a detailed schedule has been prepared by Reactor Section, data forms have been prepared for reproduction, and all special equipment is on order or being fabricated, if not already available. Sufficient volunteers are available from the physics groups of Applied Research and Pile Technology to staff the three shift coverage with little additional technical assistance from other groups. Training sessions will be held prior to startup to acquaint the crews with the tests and with the individual jobs.

The dry temperature coefficient test authorization has received most of the required signatures. A new portable gas analyzer for checking helium concentration in the process tubes during the test was ordered on an emergency requisition when it became apparent that the device on hand could not be made to operate.

KE Pile Startup Planning

A rough draft of the technical portion of the authorization for the KE Pile startup program has been prepared and forwarded to the appropriate Reactor Section personnel. All tests contemplated prior to fully loading the pile are with no water in the tubes; these tests include dry cylindrical critical loading, determinations of VSR strength in their shadowed array in a flattened pile by measurements of both scram transient

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and buckling of critical slab heights with and without the 9 central VSR's inserted, and finding the number of control elements required to hold the fully loaded cold dry pile sub-critical.

Product Yield and Quality

A study is underway to determine the best manner in which product quality vs. neutron "temperature" data may be obtained in conjunction with the high temperature graphite test being planned for C Pile. A detailed check is currently being made of the exposure history of the 20 ton control batch from which the plutonium was ultimately fabricated into shapes and counted for neutron background.

Pile Safety Studies

Numerical solution of the series expansion solution for the pile power transient following loss of water has been worked out for the most extreme case: loss of water at full power (800 kw central tube power) following a cold startup. In this case, the power level will reach 5 to 6 times the initial level within 1/2 second after boiling starts and will rise exceedingly rapidly after that. In such a case, a nuclear accident may result before the vertical safety system can take effect.

Present calculations are being extended to attempt to include the effect of the VSR system. If an excursion were to take place following equilibrium operation, the effect of the higher graphite temperature would be to reduce the reactivity gain appreciably; the time and rate at which the VSR's entered the pile would then have a significant effect on determining the potential hazards of the excursion. After proper solutions have been obtained, detailed calculations will be carried out by IBM methods.

C Pile Rod Life

Calculations of cadmium burnout as a function of exposure were reviewed to ascertain whether or not an immediate problem would result from a delay in the C Pile HSR replacement program. These calculations indicate that the present effective control strength of the C Pile rods should be very close to that at time of C Pile startup, and that any decrease in control strength over the next few months prior to replacement should not be sufficiently great to have an adverse effect on pile operation.

Gamma Shielding Effectiveness of Water

In connection with a 200 Area problem, bucket storage of irradiated uranium in shallow water was simulated in measurements using a storage area dummy elevator. The uranium slugs used in the measurements were the centering slugs contained in 11-pair J-N columns which had been irradiated to approximately 100 MWD per column and had been discharged approximately 100 days previously. Approximately seven feet of water above the top of the slugs was sufficient to reduce the reading approximately to background level. The observed intensity increase between seven feet and five feet was a factor of ten per 13 inches decrease in water depth.

Shield Damage Studies

Nuclear track photographic plates have been placed over the DR test well containing the simulated 60 per cent masonite burnout configuration. It is hoped that sufficient

indication will be obtained of the fast neutron spectrum above 0.5 Mev. to permit a good approximation of the biological dose; calculations indicate that the predominant portion of the total dosage due to all forms of radiation leakage through the deteriorated shield would be due to fast neutrons in the region of 1 Mev.

Thermal and resonance neutron data are now being evaluated on iron-limonite concrete which had been heated to an equilibrium temperature of 175 C.

HEAT TRANSFER

Cooling-by-Boiling Studies

Based upon realistic assumptions, and using the data from the 189-D mock-up facilities, it was calculated that a boiling reactor could produce overall steam qualities of 20-35 per cent. This steam quality would be obtained from a 3220 tube, enriched pile operating at a power level of 1800 MW at a pressure of 1200 psi and a maximum tube power of 800 KW with cosine heat generation. The higher quality was predicted with the use of (a) devices to permit reasonable flow control on each tube, (b) a front-to-rear control system which would result in cosine heat generation, (c) individual tube flow monitors, and (d) individual tube exit quality monitors. The lower quality would result if the exit quality monitors were not available and if vaporization were prohibited in a small percentage of the tubes which would be used to measure tube powers. The pile qualities indicated above are not the maximum values that can be reached, rather, they are reasonable values for the conditions chosen.

Equipment Procurement and Installation

Installation of the new generator in 189-D is proceeding in an orderly fashion. It is anticipated that operation of the generators and mock-up can be resumed late in November.

The design efforts necessary to permit modification of the process tube mock-up are nearing completion. It is estimated that all of the necessary equipment will be on order by the end of November. All items requiring long delivery periods have been ordered previously. Estimates of the time and expense required to perform the modification are being obtained at the present time.

Procurement activities are in progress to obtain heater tubes capable of withstanding high pressures. These activities are two-fold. Contacts have been made with an industrial concern to determine whether that company can supply tubes at a reasonable cost. Preliminary results appear optimistic even though the company has never made such tubes and even though all previous contacts with other companies have produced negligible results. The second attempt results from a design originated in conjunction with Fuel Technology personnel. It is expected that a tube of this second type may be available for testing late in November. The design and procurement of other high pressure components such as hydraulic seals and gas seals are continuing.

The mock-up facilities are being modified to permit safety studies on the K Pile process tube geometry. Special heater tubes for these studies were procured by Design Section personnel, and these tubes are being further modified to permit accumulation of additional desired data.

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Status of Tube Temperature Limits

A quick survey was made to determine the tube Δt limits at each pile based upon the Panellit settings. It was found that the outlet temperature limit for B Pile is essentially 105 C for a 10 C inlet. Presumably F Pile orificing and instrumentation could be adjusted to attain the same limits. Reorificing D Pile to correspond to B would allow 105 C in all tube rows except a few at the top of the pile. Other steps would be required to reach that limit in the top DR and H Piles, if reorificed, would be similar to D after reorificing. At C Pile, an effective 105 C may be attained at the present time.

C Pile Panellit Gage Reliability

The results of an up-to-date study on the reliability of the C Pile Panellit gages are contained in HW-33528, "C Pile Tube Pressure Monitoring System Reliability," H.H. Greenfield, 10-25-54. It was concluded that the reliability of the gages and system is essentially unchanged from the time of the initial installation in December, 1953.

Hydraulics Laboratory Testing

Due to the emergency at KW Pile regarding pigtail and temperature monitor failure, extensive assistance was given to Design personnel in (a) testing the present K pigtails to demonstrate that they are satisfactory for use on the rear face, (b) developing a method of testing pigtails under vibrational and cavitational flow conditions along with cyclic flexural stresses, (c) testing proposed rubber and aluminum replacement pigtails under adverse flow conditions, and (d) testing the resistance-type thermoelements under adverse flow conditions. No thermoelement failure could be induced under reasonably normal operating conditions.

Two different devices which will eliminate the severe vibration problem at KE Pile during pile flow acceptance testing were developed and tested. These devices are cheap and easy to install in each tube, and Design personnel presently plan to use one of these types.

Temperature Limits of 1706 KE Semi-Works

A study of the maximum allowable outlet temperature for tubes of the 1706 KE Water Studies Semi-Works was started. It is desired to operate the tubes at the highest permissible temperature consistent with pile safety from boiling considerations.

Internally and Externally Cooled Slug Studies

Tests of the flow through process tubes loaded with production-type internally and externally slugs were performed. These results were then used to calculate the temperatures to be expected under the production test which is being planned. These temperatures are reported in HW-33451, "Calculated Temperatures for Solid, Cored and Internal-External Cooled Slugs in C Pile," F.E. Tippets, 10-18-54.

Selection of the flow instrumentation and specification of the trip settings necessary to provide adequate pile safety under production test conditions are being completed. It is probable that a 40 psi Panellit trip range will be required for high permissible outlet temperatures.

Plans are being made to install thermocouples in the production test process tube just downstream of the charge in order to measure the Δt's across the hole and annulus. These data will serve to confirm the theoretical calculations.

An universal method of calculating the temperatures in internally-externally cooled slugs was prepared and is presented in HW-33434, "Heat Transfer Analysis of Internally-Externally Cooled Slugs," F.E. Tippets, 10-15-54.

EXPERIMENTAL PHYSICS

Prototype Physical Constants Test Reactor

The fabrication of graphite components for the Prototype Physical Constants Test Reactor was completed during the month and the initial lay up of the reactor was begun in the 2101 building. The control rod assemblies are fabricated with the exception of the fuel and poison slug loadings. The disc safety system is also completed. The mechanism to move the face is under fabrication and the flux leveling mechanisms are in the final phase of design. It is expected that the reactor will be assembled in 189-D building next month for performance testing of mechanical components. The construction of the building to house the reactor (305-B), which is being provided as Project CA-566, is proceeding on schedule.

Fuel element fabrication priorities at Oak Ridge may delay the delivery of the lead-uranium oxide fuel elements. Attempts are now in progress to transfer this portion of the fuel fabrication to Metal Controls Corporation who state that they can meet a January 1 delivery date. Oak Ridge will meet the above delivery date on aluminum-uranium alloy elements. The summary report on nuclear hazards - HW-32791 - "Summary Report of Reactor Hazards for the Prototype Physical Constants Test Reactor" has been transmitted for submission to the Advisory Committee on Reactor Safeguards.

Slug Rupture Detection

An inspection of the engineering capabilities of Radiation Counter Laboratory, the vendor awarded the contract to procure the spectrometer units for projects CG-578 and 579, reveals that they are presently sub-standard as a result of recent organizational changes. It is felt that there is a strong possibility that we will now receive sub-standard instruments unless some remedial action can be taken. It has been recommended that the contract be negated and renegotiated if possible at this time; the remaining alternative is that of providing the vendor with detailed comments and assistance during the developmental phases of the effort.

The prototype gamma monitor at H Pile detected ten rupture incidents during the month; several of these incidents involved multiple ruptures. In every case, the prototype performed very well relative to the beta system. Some detailed integral and differential gamma ray spectra were obtained on effluent prior to shutdown for a rupture which yielded encouraging information in support of slug rupture detection in recirculating system design. Quite substantial fission product gamma activities were observed to possess energies in excess of 3 Mev. Thus it may be possible in this application to employ a dual energy channel spectrometer with a signal channel located above the 2.7 Mev. Na^{24} contaminant which is pronounced in recycling systems.

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The major portion of the laboratory development of the "gamma-scan", a remotely scanning unit to isolate sources of high activity on the rear face, has been completed. The mercury jet scanning switch has been adapted to this application, the first twelve-detector unit has been built and tested, and effort is proceeding on detector development for larger systems.

The design of a fuel element rupture detector for the KAPL-120 recirculation loop has been initiated. The effluent in the loop will be at 600 F, 2500 psi, and recirculating with a twenty second period. The basic requirements are quite similar to those which would be experienced in an HDPR type operation and most of the development effort should yield results applicable to that case.

Neutron Economy Studies

The distribution of fissions in 1.36 inch O.D. natural uranium slug as measured with U-235 detectors and natural uranium detectors may be normalized to permit the ratio of the fissions in U-235 to the total to be extracted, thus yielding a measure of the fast effect. The data presently available yield a most probable value of 1.041 for this constant; this result is to be compared with the value of 1.033 which is currently in wide use at Hanford. The higher experimental value may presently be in error by as much as one per cent but it is believed that contemplated measurements aimed specifically at determining this constant should reduce the uncertainty to about 0.4 per cent.

Fuel Element Studies

The reactivity of several modified fuel element designs has been determined by a combination of theory and experiment. The cases evaluated include (1) 1.390 inch O.D. solid slugs with and without nickel cladding, (2) 1.390 inch O.D. hollow slugs with nickel cladding and 0.375 inch and 0.313 inch I.D., and (3) 1.336 inch O.D. - 0.375 inch I.D. hollow element clad with Al-Si. These specific assemblies have been evaluated in support of the Fuel Technology program; the results are given in HW-33587, "Reactivity Calculations on Special Slug Designs - I," A. W. Thiele.

K Pile Startup Planning

The instrumentation for the monitoring of the approach to critical, post-critical reactivity measurements, and the measurement of neutron distributions has been assembled and the major portion of the modifications required have been made. Special fuel elements and neutron detectors have been fabricated for use in neutron economy studies in special loadings. The gamma spectrometers required in the program of special studies are now being assembled and calibrated.

Instrument Development

The U-235 fission counter and associated electronics which make up the sub-critical pile neutron multiplication monitor have been assembled and tested in the laboratory. The system yielded adequate separation of the pulses from fission products and background; the capability of operating in intense gamma fields will be determined through tests with irradiated slugs. The mechanism for removing the assembly from the reactor as post-critical levels are reached is being fabricated. The mechanical components for the test hole installation at DR Pile have been designed by Mechanical Development and are being assembled. It is expected that the in-pile installation will be made at DR Pile next month.

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Progress has been made in developing an electronic controller unit which activates the safety system as a predetermined ion current level is exceeded. This system is now being fabricated and will be employed in the prototype Physical Constants Test Reactor; it may also be adequate as a trip device for the K Pile safety systems.

Test Pile - Routine Tests

Regular metal testing proceeded routinely with quality of bare slugs continuing to improve. Fourteen Mallinckrodt billet egg lots yielded TDS values ranging from 10 to 13. Twenty-one Fernald billet egg lots yielded TDS values ranging from 11 to 19. The TDS of an egg from recycle uranium was determined to be 59; tests are underway to ascertain the U-235 content of this poor quality material.

Test Pile - Special Tests

Several samples of graphite were tested for North American Aviation in support of the SRE program. The tests yielded dih values ranging from -0.04 to -0.67. These values are to be compared with +0.255 for unpurified graphite in the K Pile reflectors and +1.0 for the purified material in the K Pile active region.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

One vendor fabricated expanding metallic spline for segmental discharge was received during the month. Modifications are being made to connect the spline to the other equipment for testing. A coated fabric spline is being assembled on plant to evaluate this type of construction and another fabric spline of different design was received from a vendor.

Re-design of the mechanical holding slug for segmental discharge was completed during the month and three pieces fabricated. Testing will commence within the next two weeks.

The fluorescent Markal paint stick for the ruptured slug segregating device was received during the month and tested. Testing showed it to be completely unsatisfactory from the standpoint of facilitating segregation of the marked pieces. Further compounds are being formulated and will be tested in an attempt to perfect this system.

Horizontal Rod Studies

One engineer was still in Los Angeles this month providing technical assistance to the Asco Company in the fabrication of the boron-carbide rings. Latest information indicates the company is now in production but at a rate greatly reduced from that originally expected.

The first production samples of the seals for the new horizontal control rods were received and tested this month. Sealing qualities were found to be excellent.

The three replacement rods of the new design all continue to function properly.

The ribbed sphincter seal installed on the "A" rod at C Pile continued to operate with no leakage.

Vertical Rod Studies

The problem of the galling in the external thimbles of the K vertical safety systems was eliminated during the month by removing 1/8 inch from the diameter of the piston. When used with the original bronze piston rings, this was found to completely prevent scoring or galling of the cylinder. All of the rods installed at K were modified in this manner. Further work is being performed in an attempt to improve the Ball 3X tie-in switch.

The washer seal installed on VSR 16-C has now operated for one year with no apparent leakage.

Supplemental Control

A rough draft of document HW-32681, "Re-Assessment of Disaster Control Systems," is being circulated for comment. In brief, the document discusses all of the various disaster control systems which have been proposed and describes the degree of protection it is believed that each will afford. Work continues on the experimental determination of cooling rate and water distribution for a graphite wetting system.

Continued development work on the boron poison spline has indicated that the best approach is to roll the splines. Some success has been achieved by this method, however, further modifications are necessary to eliminate twisting in the spline. Boron grain size and rolling pressures have been standardized to give the desired spline cross section. Fabrication of the shielding cask has been started.

Work on the BF_3 supplementary control system continued during the month. The control valve leakage problem was eliminated by using a teflon to stainless steel seat. Accurate control has been obtained by the use of hand operated valves, while the motorized valves have been unsatisfactory.

Process Tube Assembly and Piping

Considerable concern was generated early this month by the failure of the aluminum connectors on KE Pile during pump flow tests. Abnormal conditions pertained in that the process tubes were empty, thus greatly lowering the back pressure on the venturis, and creating a severe cavitating flow. Excessive vibration was set up in the connectors and because of improper grain size, sections of the aluminum literally "popped" out. A joint GE-AEC task force, set up to analyze the problem, placed an order for sufficient rubber hose connectors to permit scheduled start-up of KE Pile. Samples of these rubber connectors were tested to determine their suitability. It was our conclusion and recommendation from a study of the results of these tests that the hose connector constitutes a satisfactory temporary expedient until a more suitable connector of either rubber, aluminum, or preferably stainless steel, can be developed, tested, and procured.

At month's end, tests are in progress on samples of aluminum connectors of proper grain size.

The appropriation request for the flexible connector test facility was approved early this month and shop work and procurement of purchased items has been started.

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Two Resistoflex teflon hose connectors were installed on the rear face of C Pile under Production Test 105-585-A. A bursting test was made on one of these connectors which had been severely kinked along its entire length. No deleterious effects were noticed as a result of this kinking.

Shop work was started on the high pressure test loop for the evaluation of thermal shock on flange connections. Most of the equipment for this loop is being purchased from vendors and further work is delayed pending its receipt.

Physical Constants Testing Reactor

Work orders have been issued for all mechanical components on the vertical safety system and all major components of the horizontal control-safety system. Graphite fabrication is essentially complete with layup scheduled to be started before November 1. Concrete pours for the 305-B Building have been completed for all exterior walls, the reactor pads and the TTR trench. The designs for the movable face, flux leveling device, face support frames, and the Boral jacket are well advanced.

Other Engineering Development Work

A survey was made of possible means of providing instrumentation for a boiling pile that will permit measurement of outlet steam quality. Results of the survey were encouraging and it is believed that a suitable instrument can be developed.

Investigation was made during the month of the possible application of ultrasonic methods for cleaning contaminated dummy pieces. This system is being combined with one which alternately sorts slugs from perfs and conveys the perfs to the decontamination station.

Development of under-water saws for process tube examination work is now essentially complete. Only two saws remain to be perfected, one for cutting zirconium tubing and the other to permit removal of stuck ruptures from sections of tubes.

Additional tests for new rubber samples have been scheduled by the Special Irradiations Unit. Eighteen additional samples have been mounted and will be exposed to pile effluent conditions.

GRAPHITE STUDIES

Dimensionally Stable Graphite

A definite expansion rate has been established for Korite coke graphite produced by Battelle Memorial Institute. Low exposures indicated dimensional stability of this material under irradiation at low temperatures (approximately 50 C). Recent exposures of between 2100 MD/CT and 2500 MD/CT coupled with previous data indicate an expansion rate of about 0.2 per cent per 1000 MD/CT. Pile grade CSF graphite exhibits an expansion rate of about 0.8 per cent per 1000 MD/CT at exposures in excess of 1000 MD/CT.

Thermal Conductivity as a Function of Graphitization Temperature

A dependence of pre-irradiation thermal conductivity of graphite upon graphitization temperature has been demonstrated. All thermal conductivity measurements were made at room temperature. The rate of change of thermal conductivity was found to be greatest between graphitization temperatures of 2000 and 2300 C, for both warm molded Texas graphite and extruded Cleves graphite. This rise may be associated with a perfection of crystal structure.

Effect of Pile Operation on Graphite, PT 105-1-P

Four cold test holes at D, F, and H Piles are currently charged with graphite samples under this production test. Routine irradiation for graphite comparisons and evaluations will continue. Two tubes at F Pile which contained papoose loadings were discharged recently and the samples are being measured in the laboratory.

Controlled Temperature Irradiation of Graphite, DT 105-538-E

Two ten-day irradiations, one at 25 C and one at 85 C, were completed for twenty-four samples. The accumulated exposure was approximately 60 MD/CT. Length measurements and C_0 spacing measurements have been completed. The current loading at 85 C will be used to determine if the damage will saturate.

Irradiation in Recirculation Loop, PT 105-506-E, Supplement A

The graphite samples in the H recirculation loop were discharged during the month and await physical measurement. The samples were irradiated for ninety days with inlet water temperature 40 C and outlet 150 C.

GEH-2 Program, MTR Irradiations

A comparison of Battelle E201 with Speer SGBF graphite is being carried out in the L-45 position in the MTR. The samples were charged during October and will receive a six weeks' irradiation.

Pile Graphite Sampling Device

Additional testing and improvements were made on the core borer. A positive acting device for removing the cores from the saw has been incorporated. Suitable devices for preventing personnel and equipment contamination are being fabricated for possible use with the core borer.

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High Temperature Irradiation Facility

The design of the high temperature facility to be installed at the MTR is fifty per cent complete. Testing of heater designs is being carried out. A goal for startup has been set at February, 1955.

C Pile Uncooled Test Hole

The design of an uncooled irradiation facility in the Y test hole at C Pile has been approved and construction has started. Special Irradiations Unit is handling the project.

Special Study Report

Data requested by the Special Study group were accumulated and turned over to them. This report included analysis of graphite procurement problems associated with the Special Study pile. This report has been generalized and will be issued soon as an informal document.

Graphite Oxidation Studies

A series of graphite burnout monitoring samples were removed from process channel 2577-DR at DR Pile on October 19, 1954. These samples have been exposed for 181 operating days. The burnout rates observed for the central samples was 0.2%/1000 days for large samples and 0.8%/1000 days for small samples. Maximum graphite temperature has averaged about 480 C.

A similar series of samples was removed from channel 1960-C at C Pile. These samples showed approximately the same rate of burnout at slightly higher graphite temperature.

The final series of samples authorized under PT 105-504-E have been analyzed. The following results were obtained:

1. Samples of graphite and a 30 per cent helium - 70 per cent carbon dioxide gas mixture showed a reaction rate of 0.2%/1000 days based on the decrease in partial pressure of carbon dioxide.

2. Samples of graphite and approximately 1 gram of liquid water indicate reaction rates of approximately 0.4%/1000 days. The proposed reaction is $C + 2H_2O \longrightarrow CO_2 + 2H_2$. No carbon monoxide was found in the reaction mixture.

3. Samples of graphite and nitrogen saturated with water indicated rates of 0.02%/1000 days. No oxides of nitrogen were observed.

4. Samples of aluminum and carbon tetrafluoride were irradiated in quartz ampules. The reaction observed was $CF_4 + SiO_2 \longrightarrow CO_2 + SiF_4$. The reaction was essentially 100 per cent complete.

Additional surface area measurements have been made on the full sized graphite bars removed from the "G" test hole of C Pile. Measurements taken on samples

removed from the corner of the bars indicated an oxidation of approximately 0.2 per cent. A cross section of one bar was sectioned into six pieces and surface area measurements made to determine the oxidation gradient across the bar. The data indicate a decided gradient across the bar. The minimum oxidation value was less than a factor of 3 lower than the maximum observed value. From this it can be concluded that the major portion of the oxidation of these bars occurred on the geometric surface.

Pile Distortion

Recent traverses at D and B Piles indicate that there has been little or no change in the fringe zone expansion. The data indicate that the center zone of B Pile has annealed to such an extent that the vertical height of channel 4674-B is now less than the nominal layup value at a point 20 feet from the front face. It is now evident that all piles with the possible exception of F Pile have annealed or shrunk as a result of high temperature operation to such an extent that the center point of the top of the pile stack is below layup. Continued contraction of the central zone graphite can result in a decrease in the radius of curvature at a point 10 feet from the front face.

WATER PLANT DEVELOPMENT

Flow Laboratory

Operation of the five in-pile tubes at 105-D Laboratory continued. Current tests include filtered water at pH 7.3 and 0.2 ppm dichromate, pH 7.0 and 0.2 ppm dichromate, and unfiltered water at pH 7.0 and 5 ppm dichromate. All tubes are scheduled for discharge at the next shutdown. A mock-up test was initiated to investigate reducing process water pH as a means of increasing the temperature at which calcium carbonate scale is deposited in tubes. Preliminary test results indicate that reducing pH from 7.7 to 6.5 increases scale-out temperature from 135 C to 170 C or over. Examination of steel coupons exposed to various water qualities showed excessive corrosion at 90 C with pH 7.0 and 0.2 ppm dichromate. Subsequent tests indicate that at elevated temperatures both pH and dichromate have marked effects on steel corrosion in the ranges currently under evaluation for process water use.

Preparations for shutdown of the laboratory early in 1955 were begun. All work being performed in the Flow Laboratory will be transferred to the 1706-KE Semi-Works. Construction of the 1706-KE Building proceeded. The building is essentially complete; major equipment items yet to be installed include in-pile process pumps, chemical addition equipment, and instrumentation. Overall completion is estimated at 80 per cent. At month's end, half of the Sub-Unit personnel were transferred to office facilities in the K Area.

Plant Tests

The half-plant test of pH 7.3 process water continued at 100-F. Two charges of metal are awaiting corrosion examination. It is hoped this information will provide the final needed data on slug corrosion at reduced pH. Investigation of tube corrosion is still in progress. Operation of the half-plant test of 0.5 ppm dichromate process water continued at 100-D.

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A test was conducted to determine the hydraulic limits of the KW filter plant. Results of preliminary runs indicate the filter plants will not be limiting up to pile flows of 170,000 gpm and probably up to 180,000 gpm. Further testing is planned after minor revisions to control instrumentation.

Recirculation Studies

A zirconium process tube was installed in the in-pile loop at 100-H, and charged with regular metal slugs. The system was operated at 175-180 C outlet temperature. One of the three circulating pumps was inoperable due to a faulty mechanical seal; however, this loss did not require shutdown of the system. ELMO-2 operated most of the month at 185 C using aluminum slugs in a zirconium process tube. Evidence obtained to date shows very little tendency toward increased corrosion of aluminum in contact with zirconium in high purity water. This information is further confirmed by short runs (up to one week) in ELMO-4, at a temperature of 230 C. Tests in ELMO-4 are now being conducted at 260 C.

Arrangements were initiated for fabrication of the carbon steel loop by code qualified welders. Off-site procurement of an additional high temperature loop proceeded. Further assistance was given Design in the KER project. A test was conducted to determine required flow rates to flush demineralizing resin from the top and bottom of a column. Construction of the KER Building was begun by Kaiser Engineers.

Boiling Studies

No in-pile boiling tests were conducted this month because of the faulty circulating pump in H Loop and because of operating difficulties at H Pile. Aluminum slugs exposed to 10 per cent quality steam at 190 C, 110 fps, for 15 weeks shows a slight weight loss. All shorter exposures had yielded weight gains up to 0.7 mg/cm^2. The mock-up boiling loop, ELMO-3, was discharged after 42 days operation at 180 C, 10 per cent quality. Some rib grooving was observed on slugs from the boiling portion of the tube. The loop has been refitted for a test to determine effects of a slug rupture in a recirculation system under boiling conditions. Primary purpose of the test is to obtain data on rate of dissolution of the slug and ability of the clean-up system to remove the rupture products.

PILE COOLANT STUDIES

Production Tests

Tubes 2071-C and 2276-C operating at average outlet water temperatures of 92.7 C and 95.7 C, respectively, under PT 105-519-E were discharged on September 15, 1954. These tubes had reached an exposure of 479 MD/T and had operated at 722 KW per tube. It is estimated that 10 mils of aluminum had been removed from the slug jacket of the maximum corrosion slug. Although the corrosion rates of the slugs from these two tubes are somewhat higher than would be predicted from theoretical considerations, they are in line with the corrosion rates reported in the previous monthly report for tubes 2679-C and 2975-C which operated under approximately the same conditions.

The far side of D Pile has operated throughout the month without incident under PT 105-542-E which authorizes 0.5 ppm of sodium dichromate in the water to one-half pile. This test has now been in effect for four months.

The first tube of metal to go to high exposure under PT 105-539-E was discharged at F Pile with a total concentration of 973 MWD/T. The metal is now awaiting examination and weighing.

Development Test 105-544-E to determine the effects of 72-S aluminum perforated dummy slugs on the corrosion of the rear portion of the process tube was started on September 15, 1954. Process tubes were replaced in channels 2071 and 2276 at C Pile. Tube 2071 was loaded with a normal rear dummy pattern of 2-S aluminum perfs. Tube 2276 was loaded with a rear dummy pattern of 72-S aluminum perfs. At the completion of the test, process tubes 2071 and 2276 will be removed from the pile for a comparison of the corrosion rates of the two tubes.

Installation of two 63-S, 72-S clad, process tubes in D reactor under PT 105-543-E is awaiting the convenience of the Manufacturing Department. Six additional 63-S tubes will be prepared for installation in B, D, F or H reactors.

Corrosion Monitoring

Six and one-half process tubes were examined during the month revealing no new or unusual corrosion. Inspection of the 105-B south high tank revealed the presence of a large number of barnacles on the inside of the tank. Examination of the metal under these barnacles revealed no deep pits. Inspection of the 105-C north high tank showed it to be in good condition; however, some paint was peeling off the roof of the tank. No corrosion of the exposed metal was observed.

The borescope modified for inspection of rear Van Stone flanges was tested on the rear face of H Pile. The test was not too successful due to the borescope disturbing the water and restricting the flow. Further modification of the borescope has corrected this condition.

Laboratory Corrosion Studies

After four months operation on cold pH 7 water the front tube mock-up was inspected. The four tubes that had operated with no dichromate in the water averaged about 80 times the number of barnacles per foot as compared to three of the tubes operating with 0.2 ppm sodium dichromate. A fourth tube operating with 0.2 ppm sodium dichromate had about the same number of barnacles as those tubes operating with no dichromate in the water. In all of the tubes a slimy film, which spectrographic analysis had indicated to be aluminum oxide, has deposited evenly. This deposit was similar to the film observed in short sections of tubes run on the low pH side of F Pile. It is believed that the film is a result of diminished solubility of Al_2O_3 at a pH 7.0 to 7.3 compared to pH 7.6.

The flow laboratory test to determine corrosion characteristics of hot pressed slugs has been in operation for 14.5 days. The type of slugs being used in this test are internally-externally cooled slugs, solid slugs with small grain cans, and solid slugs with large grain cans. The first group of slugs will be discharged after 20 days of operation at 110 C.

A test to determine the corrosion rates of 2-S aluminum slugs in pH 7.3 water at 140 C exposed in aluminum and zirconium tubes was completed during the month. Corrosion rates, as determined by plots of weight loss versus exposure time, show values of 0.73 $mg/cm^2/day$ for the Al-Al system and 1.44 $mg/cm^2/day$ for the Al-Zr system.

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A test of the corrosion characteristics of high purity aluminum base +1/2 per cent magnesium slug jacket material is now being run at 140 C in aluminum and zirconium tubes. Initial data have indicated that this alloy has better corrosion resistance at 140 C than 2-S aluminum.

The use of brass fittings on K Pile rubber pigtails was reviewed. It was concluded that no serious corrosion problems will arise from this source. Five of the rubber pigtails, coupled to aluminum sacrificial fittings have been placed on test in cold process water to check this conclusion.

SPECIAL IRRADIATIONS

The accumulated exposure for the energy release in a single process channel (Bluenose, 0706-84) at C Pile is approaching the desired 600 MWD/T. Discharge of the fuel elements will take place at the next shutdown. Recently, the calibrations of the temperature-sensing elements were checked and found to agree with the initial calibrations within the limits of experimental error.

The ninth experimental assembly pertaining to the study of the creep of nickel was charged into F Pile October 19. The experiment was successfully completed October 25, with the rupture of the last of the creep specimens. This assembly was the last planned for this series of irradiations.

The major design for the modification of the high pressure, high temperature recirculating loop for KAPL is essentially complete. The majority of components is on order. Out-of-pile components of the existing loop not required in the modification have been removed to the burial grounds. Removal of the in-pile tube is scheduled for the period between December 15 and January 15.

Equipment for studying the effect of pile atmosphere impurities on zirconium and zircalloy-2 (HAPO-105) is still being assembled. Instruments to control the temperature of heaters is the main item remaining to be completed. The experimental assemblies are scheduled to be charged into F Pile during a November shutdown.

Removal equipment in support of the removal of zirconium and zircalloy-2 process tubes (HAPO-110) from a pile has been assembled. This equipment consists of a guillotine of beefed up design actuated hydraulically from a remote station. Testing of this equipment and the actual irradiation of tubes continues to be delayed by the lack of arrival of process tubes.

The high temperature graphite exposure facility (HAPO-128) is now being fabricated in the shops. Plans call for this facility to be installed at the beginning of calendar year 1955.

The three tubes at H Pile charged with experimental assemblies to study the in-pile reaction of nitrogen and graphite at ambient pile temperature (HAPO-140) continue to be exposed. Difficulties experienced in maintaining a satisfactory gas flow through these tubes have been removed. Satisfactory operation has been achieved in all phases.

Auxiliary equipment in support of irradiation studies which have been designed include a high intensity cobalt facility and a highly sensitive ionization chamber. The ionization chamber has a 26-liter volume and can be pressurized to operate at atmospheric pressure. A 4π geometry has also been employed in the design.

The Cd-Co ration has been measured in tube 0777 at C Pile at equilibrium power level using 6 mil aluminum foil containing 0.08 per cent cobalt. A value of 14.4 was obtained for this quantity.

Liaison activities in support of KW Pile continue. A program for the testing of the pneumatic facility has been agreed upon. An in-pile test of the K-Rashield pieces used in the general purpose test holes has shown that the hydrogen released from the innermost pieces by radiation damage from fast neutrons could give rise to an explosive mixture in the facility. Iron and canned graphite have been substituted for these pieces.

Isotope production continues as scheduled. Extended assistance has been given in support of numerous research and development programs in the performance of in-pile irradiations.

TECHNICAL LIAISON

Project CG-558

The bulk of the activities concerned further scoping of the F and H Area portions of the project. Scoping for these two areas is about 72 per cent complete, and is 86 per cent complete for the entire project. Detailed design is about 43 per cent complete.

Consideration was given to the proposal that the project include the preparation of as-built drawings for all buildings affected (i.e., should complete new drawings be prepared for the 105 Buildings since these are being modified, in a way, by the project). Since the need for new as-built drawings arises from many other projects, it was concluded that it would not be appropriate for this work to be considered as a part of Project CG-558.

Consideration was given to a request by Manufacturing that nozzles be modified to conform to a scheme for changing tubes without removing nozzles. Lacking firm details of the proposed tube and nozzle design, the project representatives agreed to postpone nozzle procurement one month to provide time for the feasibility and economic justification to be demonstrated. If the feasibility and justification are not demonstrated within this time limit, the nozzles will be procured as now approved.

Other Projects

No project representative meetings were held during the month.

ECONOMIC ANALYSIS

Studies during the past few months on the effects of lattice spacing, specific heat generation, power level, and in-pile boiling on the economics of single and dual purpose piles culminated in the formulation of recommendations for the Design Section to consider larger lattices, low specific power, and in-pile boiling in future design feasibility studies. The studies indicated that pile economics are not markedly affected by lattice spacing, that power levels of about 1600 MW are in the region of reasonable economic efficiency, and that the economic gains from in-pile boiling are sufficient for the recommendation that this method of operation be examined in greater detail.

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Pilot studies are now in progress on the effect of lattice spacing in fail-safe-arrays on slug temperature effects, and on the factors determining whether minimum required slug density increases or decreases with lattice spacing. Results to date are not conclusive.

A previous study determined the effect on required fuel exposure and allowable reactor capital cost of the various elements which determine the price of power. Results of this study were extensively revised and re-worked in light of recent capital cost data.

INVENTIONS

All persons engaged in work that might reasonably be expected to result in inventions or discoveries, with the exception of that listed below, 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. 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.

Power Measuring Device — John M. Roberts

R. B. Richards

R. B. Richards, Manager
Pile Technology Sub-Section

[redacted]

HW-33589 DEL

SEPARATIONS TECHNOLOGY SUB-SECTION

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VISITORS AND TRIPS

R. C. Feber visited here from Knolls Atomic Power Laboratory, Schenectady, New York, October 4 through 8 for consultations on Redox.

F. A. Owings visited here from Washington AEC, October 12 on revision of the Reactor Handbook.

E. Lamb visited here from ORNL, Oak Ridge, Tennessee, October 18 and 19 to discuss radioactivity assistance for ORNL.

E. Miller visited here from Washington AEC, October 27 to discuss current redox uranium contamination problems.

R. J. Sloat and F. W. Woodfield visited ORNL, Oak Ridge, Tennessee, October 19 through 21 and Mallinckrodt Chemical, St. Louis, Missouri, October 22 for separations process consultations.

ORGANIZATION AND PERSONNEL

	September	October
Administrative	2	2
Contact Start-Up Engineering	4	4
Chemical Development	83	82
Plant Processes	49	48
Analytical Laboratories	33	33
Total	171	169

Chemical Development: One Junior Engineer was transferred in from Plant Processes, one Chemist II was transferred in from Analytical Laboratories, one Technical Graduate was transferred to Analytical Laboratories, one Rotational Trainee was transferred to Design and one Rotational Trainee was transferred to Applied Research.

Plant Processes: One Junior Engineer was transferred to Chemical Development.

Analytical Laboratories: One Junior Engineer was transferred in from Reactor Section, one Technical Graduate was transferred in from Chemical Development, one Chemist II was transferred to Chemical Development, and one Rotational Trainee was transferred to Project.

PUREX DEVELOPMENT

Chemical Engineering Development

Pulse Column Studies - Nineteen 3 inch diameter and twenty-one 8 inch diameter Purex pulse column studies were carried out with "cold" uranium. The main objectives of this work were (a) to investigate the throughput capacities of the scrub sections of the A-type columns; and (b) to test modified IB Extraction Column sieve-plate and louver-plate designs which might increase the capacity

of that column from the approximately 17 ton/day instantaneous uranium processing capacity of the present plate design (specified in Document HW-29688) to at least 25 tons/day.

Purex Chemical Flowsheet HW #3 was employed as the basic chemical flowsheet, with indicated experimental modifications in some of the runs. The highlights of the new findings are as follows:

1. (a) The complete flooding capacity of a 3 inch diameter HA Column scrub section at 0.6 inch pulse amplitude and 40 cyc./min. was found to be 750 gal./(hr.)(sq. ft.), sum of flows, corresponding to 30 tons U/day in a 32 inch diameter (Purex Plant size) HA scrub section. (Local flooding was not encountered below the complete flooding threshold.) The plate section consisted of 13 feet of "standard cartridge" sieve plates (stainless steel plates with 1/8 inch holes, 23 per cent free area, 2 inch plate spacing). A dual scrub was employed, with water as the terminal scrub, and the intermediate scrub (HAIS, 5 M HNO_3) introduced 8 feet below the top plate. The sieve-plate design, plate section height and pulse amplitude simulated those designed for the Purex Plant. The flood originated in the lower (acid-scrub) section.

(b) With the scrub column operated with a single scrub (3 M HNO_3), introduced at the top, the flooding capacity decreased to 620 gal./(hr.)(sq.ft.), sum of flows, corresponding to 25 tons U/day in a plant-size 32 inch diameter column. The decrease in capacity appeared to be an effect of the lengthening of the acid-scrub section (from 5 feet with the dual scrub to 13 feet with the single scrub).

2. In an 8 inch diameter IBX Column of full Purex Plant height (28 feet high plate section), the throughput capacity was limited, by cyclic local flooding to 650 gal./(hr.)(sq.ft.), sum of flows, corresponding to 17 tons U/day in a 27 inch diameter (Purex plant size) column. Complete flooding occurred about 20 per cent above the cyclic local flooding threshold. These findings, at 0.8 inch pulse amplitude and 40 cyc./min. with the present Purex Plant plate section design ("standard" sieve plates and 18 per cent free area louver plates), confirms earlier results with a shorter (13 feet high) 24 inch diameter IBX Column plate section.

3. (a) It was found possible to increase the cyclic local flooding capacity of the 28 foot high, 8 inch diameter IBX Column to approximately 35 tons U/day and the complete flooding capacity to over 40 tons U/day (equivalent, 27 inch diameter basis) by employing the following, more open plate section design:

Stainless steel sieve plates with
- 3/16 inch holes,
- 33 per cent free area,
- 4 inch plate spacing.

25 per cent free area louver plates,
- at 4 foot intervals,
- louvers oriented up,
- 6 inch plate free section above and below each louver plate.

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Technical Manual

On October 25 the preparation of the Purex Technical Manual was approximately 55 per cent complete.

Mechanical Development

Pump Development - A 5-hp submersible regenerative turbine pump fabricated by the General Engineering Laboratory equipped with CSGBF pile graphite bearings and stainless steel journals was inspected after pumping Purex 1CU at 14 gal./min. against a 45 foot head for 3205 hours. Diametral bearing and journal wear of less than 0.001 inch indicate pile graphite to be a satisfactory bearing material for the service imposed.

Irradiation of Kel-F - The flexural fatigue testing continued on 10 sample coupons of Kel-F sieve plates irradiated in dissolver solution and by the F-Pile basin gamma source to between 2.6×10^5 and 2.6×10^7 rads. The coupons have been flexed without failure for 2.8×10^8 cycles (equivalent to 5.5 plant years) at a stress of 75 lb./sq.in. which is about 2 1/2 times as high as will be attained in the Purex Plant columns.

URANIUM RECOVERY DEVELOPMENT

Process Studies

Processing of Unneutralized Current $BiPO_4$ Process Uranium Waste - All current uranium metal waste from the $BiPO_4$ Plant is being neutralized and routed to underground storage tanks. Some time later it will be necessary to remove the wastes from the tanks by hydraulic mining for processing in the TBP Plant. Means are being considered for processing successfully the "new" metal wastes to permit direct coupling of the $BiPO_4$ Plant with the TBP Plant so that intermediate neutralization and storage can be eliminated.

A direct coupling flowsheet (TBP HW #7 Flowsheet) presented in HW-33708 is similar to the TBP HW #6 Flowsheet. This "two cycle plus tail end" flowsheet is predicted to provide marginal decontamination with the uranium product containing approximately 120 per cent of aged natural uranium gamma fission product activity. Of this activity approximately 50 per cent is expected to be ruthenium, the major portion of which will be removed in the calcination operation. Since the predicted decontamination would optimistically result in satisfactory decontamination of current $BiPO_4$ process waste, the #7 Flowsheet is being proposed as the basis for a plant test processing current metal waste. Deviations from nominal flowsheet operating conditions could well result, however, in off-standard batches requiring rework.

Process Chemistry

Effects of Diluent Degradation Products - A sample of the products of the reaction of Shell Deodorized Spray Base (E-2342) with 2.25 M HNO_3 under total reflux for 28 hours, isolated chromatographically (by the Chemistry Unit, Applied Research

Sub-Section) was investigated in the Process Chemistry Laboratory. These products were shown to be the same as those found in Uranium Recovery Plant RCW (spent solvent), namely alkyl nitro compounds and carboxylic acids, plus alkyl nitrites and nitrates, the latter two being minor constituents. This material was spiked into carbonate-washed laboratory synthesized 20 per cent TBP in Shell Deodorized Spray Base (to the extent of 4 volume per cent) which was then used in a series of batch solvent extraction contacts. The data show that these HNO_3 Shell Spray Base reaction products strongly complex fission products, principally Zr-Nb. The uranium distribution ratio, Ea, under dilute strip column conditions ("C" contact) was found to be 0.28, (in contrast to an average Ea for Plant solvent of 0.005 to 0.01) indicating that the materials also strongly complex uranium. Foam tests on calcination of 50 ml. aliquots of 2 M U solutions in stainless steel beakers showed that 210 parts of the HNO_3 Shell Spray Base reaction products per 10^6 parts of U caused severe foaming and 40 parts/10^6 parts U resulted in a slight foam. In addition, the material was found to give a false positive test for DBP (DBP was known to be absent), the 4 volume per cent solution analyzing 50 mg./l. as determined by the standard disengaging time method employing zirconyl nitrate solution.

Continuous Calcination

The 16 inch diameter by 8 foot long agitated trough ("screw") calciner was installed at the test location in 321 Building. Installation of the off-gas system, the electrical wiring, and the heating units is in progress. Following installation of thermocouples and lagging of the reactor, initial test operation is expected early in November.

MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

Process Studies

Alternative Methods of 200 Area Processing - A comparison of operating costs for a number of 200 Area processing schemes was issued as Document HW-33394-RD. This document, covering studies discussed in last month's report, presents the relative technical, operation, and economic merits of the BPX, TBX, Redox Phase IV, and Bitrex schemes for processing low MWD/T irradiated uranium.

Ferrocyanide Scavenging of TBP Stored Waste - With the initiation last month of routine scavenging of current TBP Plant waste, design emphasis has shifted to the scavenging of the TBP Plant wastes which have already been stored. A chemical flowsheet suitable for the scavenging of such wastes has been prepared and transmitted to the Design Section in Document HW-33536.

HOT SEMIWORKS

Conversion to Purex

Conversion of the Hot Semiworks facilities for operation on the Purex process was 98.3 per cent complete as of October 25. Twenty-four hour shift operations, seven days per week, in preparation for startup of the Hot Semiworks Purex-process test program, were started on October 18.

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REDOX PROCESS TECHNOLOGY

Process Performance

Considerable variation in overall uranium decontamination factors have been experienced during the period. As indicated in the following table, the primary difference has been in First Cycle uranium decontamination. Second Cycle decontamination has not changed appreciably, and the reduction in Third Cycle decontamination factor is attributed to recontamination of product solutions by activity being removed with solids from equipment.

	Gamma Decontamination Factors (dF)			
	U			Pu
	9/24-30	10/1-7	10/15-21	
Head-End	0.2	0.1	0.1	0.2
First Cycle	4.0	4.5	4.3	4.2
Second Cycle	1.1	1.3	1.2	2.4
Third Cycle	0.9	0.6	0.4	1.0
Overall	6.2	6.5	6.0	7.8

Basically, the inferior uranium decontamination is apparently the result of entrainment of highly active aqueous phase and solids with the organic phase overflowing the decontamination columns to the stripping columns. Plutonium decontamination continued to be excellent.

Testing and evaluation of recent changes in Uranium Cycle flowsheets were continued. After several weeks of elevated (70 C) IAF temperatures with no noticeable effect, the IAF temperature was returned to approximately 50 C because of a thermohm failure. No significant changes in the Second and Third Cycle decontamination factors were noted as a result of the three flowsheet changes initiated last month: (1) and (2) 3DA and 2DA composition changes to 0.5 M HNO_3 and (3) routing of sodium hydroxide directly into the ICU Concentrator F-2 pot instead of tower. However, because of the apparent contaminated state of the columns, any effect may have been masked, particularly in the latter case. The significant improvement in the First Cycle decontamination factor appears to be due to the elimination of the addition of non-routine and non-standard Z-Plant recycle to the IAF. While the quality of these solutions is being improved at Z-Plant, (i.e., elimination of emulsifiers and filtration of solids), these non-standard solutions are being processed via the 2AF, vice IAF.

An automatic 2DU solution gamma monitor was put into operation on September 25 and is to be used for evaluation of tests. However, to date it has been of negligible value because a representative sample has not been obtained continuously. However, after several minor revisions to the sampling system, the unit is beginning to respond better so that evaluation of future tests may be more rapid.

The "temporary" silica gel tail-end facility for filtration and adsorption of zirconium and niobium from uranium product has been used during the month to decontaminate the 3EU to the shipping specification. Approximately 73 per cent of Redox uranium shipments during the period were direct to the 224-U Calcination Plant (without rework through 221-U Metal Recovery Plant).

Feed Preparation

Until October 11 the dissolvers were charged with uranium having an average pile exposure of 587 (520-678) MWD/T and "cooled" an average of 110 days. For the remainder of the period, charging was performed so that, by the end of the report period, metal exposed for approximately 900 MWD/T was being charged. On October 25, approximately 66 per cent of the high MWD/T (760-900) currently scheduled for processing had been completed.

All IAF batches were oxidized with the permanganate Head-End treatment procedure using chromium(III) nitrate as the reductant and employing manganese dioxide scavenging for most batches. Because of the G-5 Centrifuge Feed Tank agitator failure (bent shaft because of whipping) on October 19, two runs were purposely processed without scavenging.

Non-standard Z-Plant recycle additions to the IAF were discontinued on September 21 because of their potential effect on First Cycle decontamination. Only supernates, filter boat cleanouts, reprocessed filter boat cleanouts, and sample can cleanouts are being processed in IAF. Non-standard and non-routine Z-Plant recycle solutions have been added to the 2AF occasionally since October 2. There appears to have been an increase in the frequency of 3A Column overflow line binding during the month (such as that experienced from plant start-up until April 1953). Although occasional binding has previously occurred after extended periods of 3A Column operation without a flush, this difficulty may indicate impending difficulties of continually adding such recycle solutions to the 2AF. Steps are in progress in Z-Plant to improve the quality (i.e., decrease the solid and emulsifier content) of these solutions prior to Redox processing.

The H-5 Ruthenium Scrubber pump was replaced on October 25 in order to seal a large air leak at the flange of the former pump which limited the H-4 Oxidizer vacuum.

Waste Processing

The D-13 Waste Receiver was replaced on October 7 so that processing rates subsequent to this date were no longer limited by this tank. The D-8 Waste Neutralizer agitator failed on October 21 after 650 hours of service and forced a plant shutdown. This agitator was the first of the agitators of the new design having a process-lubricated lower bearing and gas-purged labyrinth seal. There was no indication that the agitator failed because of the new bearing or seal design.

The supernate in the three foot diameter test tank in the 241-SX Waste Tank Farm apparently started to boil on about October 7. The supernate temperature in this tank rose to a maximum of 223 F, presumed to be the boiling point. At the time the supernate stated to boil, the sludge temperature began to decline, gradually

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dropping from a fairly steady 270 to 271 F to about 258 F. Subsequently, the zero-level temperature again rose to 273 F. It is postulated that the drop in bottom temperature was due to agitation caused by boiling in the supernate and sludge. The temperature gradient in the tank indicates that the sludge layer is 8 to 9-feet deep.

The supernate temperature in the 241-SX-101 Tank is 211 F at report time. The temperature at the bottom of this tank averages 275 F.

The pressure recorders on the 241-S-101 Tank were again placed in service on October 8. Five surges varying in duration from 10 to 30 minutes and in maximum pressure from 22 to 27 inches of water were recorded between October 8 and 25.

Process Chemistry

Redox Plant Emulsions and Entrainment in U Cycle Organic Streams - During the past month, most of Redox Process Chemistry effort has been concentrated on attempting to characterize and alleviate the entrainment of "hot" aqueous and solid particles in the hexone extract streams. This entrainment appears to account for failure of the Redox recovered uranium stream to meet radioactivity specifications most of the time since installation of the larger, Phase II solvent extraction columns in July of this year. Highlights of recent Plant performance and supplementary laboratory tests are summarized below:

1) During the middle two weeks of October, Redox operation were characterized by an almost continuous increase in decontamination. The final batch of product solution, before a forced shut-down on October 21 due to a waste tank agitator failure, had a gamma ratio of about 3.2 relative to the gamma activity of aged natural uranium.

2) It was shown in the laboratory that the removal of the "solids" from the uranium product solution by filtration gave an arithmetic gamma decontamination factor of 2 to 5 during the week immediately preceding the shut-down. Comparative data for the 2DU stream samples taken from the plant are given in the following table:

ENTRAINMENT IN 2DU

Sample Date	Entrainment, Vol. %	Gamma Ratio,* as Received	Gamma Ratio,* After Removal of Entrainment	D.F. from Laboratory De-entrainment
9-16-54	0.2 (plus black "solids")	76	0.9	84
9-17-54	1.0 (plus black "solids")	415	29	14

ENTRAINMENT IN 2DU (Continued)

Sample Date	Entrainment, Vol. %	Gamma Ratio,* as Received	Gamma Ratio,* After Removal of Entrainment	D.F. from Laboratory De-entrainment
9-20-54	0.2 (plus black "solids")	200	10	20
9-30-54	1.0 (clear)	3.3	1.1	3
10-14-54	0.7 (clear)	8.3	0.7	12
10-18-54	0.2 (plus black "solids")	114	2.2	52

* Ratio of the gamma activity from fission products to the gamma activity of aged natural uranium.

3) A sample of F-4 (3DF) solution containing similar particulate matter was decontaminated from a gamma ratio of 330 to 60 by filtration.

4) The particulate matter from a sample of the uranium product solution (E-12) was examined under the microscope (up to 250 power) and appeared to be almost entirely amorphous. Each "speck" was composed of thousands of minute spheres -- thus indicating thet the "solids" are primarily globules of highly stable emulsion. When treated with various agents such as concentrated HNO_3, the emulsion was slowly dispersed (some evidence of actual dissolving was noted -- perhaps finely divided metallic iron) and a black scum was formed such as that which might be expected from powdered graphite.

It has been pointed out that since Phase II equipment changes in the Redox Plant there has been no really satisfactory operation with the exception of the short period prior to the October 5 shutdown. Even that was due to an unprecedented rise in first cycle decontamination, and the second cycle decontamination has never returned to "normal". Regardless of the reason (or reasons) for entrainment it has been positively established that 2DU entrainment does occur, in which both liquid and particulate matter are involved. Since by far the worst of the fission product contamination accompanying the entrainment is associated with the particulate matter, it must be assumed that the fission products themselves either cause the emulsification (seen under the microsope) or are accumulated as a result of the emulsification. Since no way has yet been found to prevent the formation of such interfacial sludges or to eliminate from the process the materials which make them up, current laboratory tests are aimed at developing means of preventing them from being carried through to the final uranium product. The most promising short-range methods of removing these highly radioactive emulsions and solids from the process streams are (a) the installation of jets (such as in the top disengaging section of the 2D Column) to remove the emulsion layer periodically, and (b) coalescing or "filtering" the emulsion and solids from the 2DU stream.

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De-entrainment in U Cycle Organic Streams - The 2DU stream was selected for the study of de-entrainment for a number of reasons, viz.: (a) it consistently contains more entrained material than any of the other streams; (b) the second cycle decontamination performance is abnormally low; (c) it is the point at which the greatest benefit is to be gained (i.e., the largest F.P. decontamination factor) from removal of the extraneous material; (d) accumulated data show that with normal first cycle decontamination plus the removal of entrained materials from the 2DU, most of the Redox uranium product would meet specifications in two cycles. Because a temporary de-entrainment device is under consideration for the Redox Plant, work has been started in the laboratory to determine the feasibility of coalescing the entrained aqueous by passing the organic stream downward (co-current flow) through a packed chamber and removing the coalesced aqueous phase by a simple phase separator. The most effective packing tested to date has been Pyrex glass wool, which permits essentially 100 per cent removal of entrained aqueous in laboratory prepared aqueous-in-organic suspensions. The glass wool was effective regardless of its packed density or its pre-treatment with Dri-Film or cleaning solution. However, up-flow (counter-current) through glass wool was less effective in obtaining the desired phase separation. Preliminary tests indicate that glass wool may give a prohibitively low flow capacity, and thus exploration of other potential media is being continued and evaluation of favorable media will be extended to obtain data on pressure drop, effective life, and apparent fission product decontamination.

Tail-End Silica Gel Treatment of Uranium Product - An improved silica gel decontamination of the final Redox uranium product solution (E-12) was demonstrated by a laboratory run in which the solution was made 1 M in HNO_3 and refluxed for 24 hours before passing through the silica gel. The composite product stream was decontaminated from gamma emitters by a factor of 7.3 after 30 volume displacements and by a factor of 4.8 after 60 displacements, compared with factors of 2.3 and 2.0 for the same solution without acidification.

Metal Removal

Three tank farms, operated at an overall time efficiency of about 22 per cent, produced about 40 per cent of the uranium processed through the TBP Plant. Approximately 5770 net gallons of stored metal waste, with this volume increased by an additional 4070 gallons through the use of water for sluicing, were removed for each ton of uranium processed. Feed uranium was aged a minimum of 3.1 or 3.2 years from pile discharge after irradiation to an average 459 or 371 MWD/T. Major production curtailments were due to lack of TBP Plant demand. Tank farm equipment difficulties resulting in down time included replacing of plugged slurry transfer jets at BXR and a 104-C Johnston supernatant transfer pump failure. A heel jet installed in 104-C has replaced the pump.

Feed Preparation

Routine acidification after an average 60 volume per cent boiloff gave 3 M titratable nitric acid in concentrated tank farm feed, using 13,570 pounds of 100 per cent nitric acid per ton of uranium.

The major portion of the feed uranium processed was rework from RCU and Redox UNH requiring additional decontamination. In general, these UNH solutions were blended and acidified to give a feed at one pound of uranium (0.5M), and one pound of nitric acid (2M) in each gallon. Rework RCU was concentrated before acid butting.

Waste Handling

Approximately 10,770 gallons of neutralized waste, containing about two per cent of the tank farm feed uranium, were returned to storage for each ton of new uranium processed. This average waste volume includes operation for less than one week using waste concentrators and for over three weeks processing unconcentrated nickel ferrocyanide-scavenged waste, and includes wastes produced during rework operations. Waste scavenging, initiated on September 29, was continued routinely. About 25,060 gallons, containing 0.05 per cent of the new uranium, were routinely cribbed for each ton of new uranium processed.

Of significance to the overall waste scavenging program are the following pertinent items: (a) when processing a large percentage of rework the buffering effect of phosphate ion is lessened to a considerable degree resulting in a pH system that is highly sensitive to even minor changes in acid or base concentration, (b) strontium activity, as measured in 110-BY samples, may be above the recommended lower limit of 0.1 microcurie per milliliter when the pH falls below about 8.5, and (c) cesium activity, as measured in 110-BY samples and in earlier 101-T samples, is below the lower recommended limit of 0.1 microcurie per milliliter at pH values up to at least 10.2, and probably up to 10.5. Off-standard pH conditions could result in failure of cast-iron and bronze pump bearings with resultant down time, or in unsatisfactory fission product scavenging requiring an uneconomically large crib area. Thus, to minimize the probability of encountering these conditions the pH in the neutralizer has been increased from 9.0 ± 1 to 9.5 ± 1 and every stream going to the WR-001 receiver without passing through the neutralizer is to be neutralized.

Solvent Extraction

Operating Conditions - The solvent extraction batteries operated at about 35 and 64 per cent on-stream time efficiency, for "A" and "B" Lines, respectively, under essentially TBP HW #4 Flowsheet conditions modified to the use of dual-scrub RA Columns, 20 volume per cent TBP in hydrocarbon diluent as organic phase, RCX and RAF at 55 ± 5 C, RAIS at 6 M HNO_3 after September 28, and the use of three weight per cent sodium carbonate as solvent wash. Nominal instantaneous single line operating rates ranged from 100 to 200 per cent of nominal design input rate to give an overall plant processing rate of 71 per cent of design. The total uranium processed included 40.3 per cent tank farm feed, 40.5 per cent Redox rework, 16.3 per cent RCU rework, 1.8 per cent 224-U Conversion Plant rework, and 1.1 per cent 221-U, TBP Plant, rework from process wastes and sump materials. The tank farm feed gamma activity averaged 0.38 curies per gallon, equivalent to 5×10^6 per cent of aged natural uranium gamma. Difficulties with waste transfer caused the major down time, and additional minor down time was experienced for "A" Line RAF pump (P-19-6) replacement, and a steam outage.

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General Performance - RAW losses were 1.3 and 0.4 per cent of the feed uranium in "A" and "B" Lines, respectively. Steady state losses were generally low, ranging from 0.01 to 0.05 per cent of the feed uranium, but transient high losses of up to 10 per cent during unstable operating periods, in "A" Line, or siphoning of the interface cleanout jet, in "B" Line, resulted in the higher overall average values. The "A" Line instability was due to the presence of organic phase from RAU spill-overs by way of the RA Column vent into the RA Feed Tank.

RCW losses were 0.02 and 0.07 per cent of the feed uranium in "A" and "B" Lines, respectively. The two-to-ten-fold improvement in "A" Line RC Column losses, compared with the previously reported operating period, reflect the use of 70 per cent of nominal flowsheet RCX flow when the pulse frequency was reduced due to instability to less than 80 cycles per minute. The higher "B" Line losses reflect a period of operation at up to 110 per cent of the target uranium feed rate during the processing of concentrated rework RCU, and short transient high losses of 0.3 to 1.0 per cent during rapid rate and RAF composition changes. Gamma decontamination factors are uncertain because of blending of Redox UNH, RCU rework, and miscellaneous feeds in varying proportions with tank farm feeds, the effects of startups and shutdowns, and column instability due to reasons extraneous to the process. An overall calculated average blended feed gamma activity, irrespective of source, of ca. 2×10^6 per cent of aged natural uranium was reduced, by one or two cycle operation, to about 220 per cent. Plutonium, nitric acid, and total metallic impurities in RCU product averaged 4.7 parts per billion parts of uranium, 0.08 pounds per pound of uranium, and 140 parts per million parts of uranium.

Project CG-562 (changeover to two-cycles) - Cell 16 was successfully decontaminated by a series of chemical flushes including caustic-permanganate, caustic, hot water, nitric acid-ferrous ammonium sulfate, and finally hot water. Initial radiation levels of over 16 rads/hr. were reduced to about 60 mrads/hr. Provision of a working platform, the cell key block, and a plywood cover reduced working exposure levels to about 20 mrads/hr. at which exposure level a four-inch diameter hole was successfully drilled through the section 8 dividing wall into Cell 15. This hole will be used to permit installation of the 8-1 (Concentrator) to 8-7 (Concentrator Receiver, new) gravity flow line. The "A" Line (second cycle) equipment has received a series of flushes.

Solvent Treatment - Two and one-stage solvent washing with three weight per cent sodium carbonate was continued in "A" and "B" Lines, respectively. No improvement in solvent quality due to the use of two similar stages rather than one stage is evident from a comparison of "A" and "B" Line data. Solvent consumption, for the period, included 8 gallons of TBP and 34 gallons of diluent for each ton of uranium processed.

URANIUM CONVERSION PROCESS TECHNOLOGY

An average production rate of 54.5 per cent of the nominal design capacity, for electric and gas-heated pots, was sustained. Major production curtailments were due to lack of feed. Of the uranium calcined 49.5 per cent was received directly from the Redox Plant, 24.7 per cent was Redox source uranium reworked in the TBP

Plant, and 25.8 per cent was of tank farm origin. Total metallic impurities, fission product gamma activity and plutonium in product UO_3 averaged 118 parts per million parts of uranium, 91 per cent of aged natural uranium gamma, and less than 5 parts per billion parts of uranium. An average of 0.04 weight per cent sulfamic acid additive was used during calcination with a resultant 1.17 average reactivity ratio to standard UO_3.

Test operations included (a) resumption of gas-fired calcination pot operation, with evidence that satisfactory quality powder may be produced, without undue pot stress due to expansion, if heat input is controlled to conform to heat requirements and heat transfer characteristics of the pot charge during the calcination cycle, (b) continuation of agitator torque testing in electric pots, leading to the not yet completely confirmed observation that at 30 revolutions per minute time cycles are not adversely affected, whereas at values below 30 rpm the heating cycles are extended, (c) continued successful use of Dow Corning AF Emulsion as a foam inhibitor, and (d) initial successful testing of a proprietary detergent, "Actane 33", along with a surfactant, "Enthone", in decontamination of equipment for contact maintenance.

Operation of T-A-1, Absorber, to give 53 weight per cent nitric acid by recycling acid from the Cooler to plate 2, 4, or 6 is planned to start about November 1. An RCU filter, with a filter cloth element, is being fabricated for early testing. Cleanout of the E-D-6 (60 to 100 per cent) Evaporator is planned using the "Enthone" surfactant and HF.

Equipment experience included (1) the removal of a 12 inch diameter circle from the center of the failed Luckey pot, No. 20, (2) failure of an X-3, unloading system, Orlon bag by tearing after 30 days in service, and (3) the failure of the removed liner from electric pot No. 2. The cause for the electric pot liner failure has not been determined, but this pot, and other electric pots, have been in essentially continuous service for over two years.

Radiation levels, in the pot rooms, have increased from an average of 28 to 45 mrads/hr. over the past three months and, despite shielding, are a potential problem. Unshielded pot radiation levels range from 100 to 1800 mrads/hr.

Routine steam stripping operations, using E-D-1 and auxiliary steam, resulted in a condensate loss of 0.02 per cent of the uranium processed through the stripper.

Nitric acid recovery operations, using a continuous chloride purge in the T-A-1 Absorber, led to recovery of an indicated 935 pounds of 100 per cent nitric acid per ton of uranium calcined. This acid, in approximately 40 weight per cent solution, was returned, along with about 0.76 per cent of the uranium calcined, to tank farm blending operations.

IN-LINE INSTRUMENTATION

The Redox 2DU gamma monitor failed initially to reflect known changes in activity of the 2D Column organic overflow stream. The monitor does register and record accurately the activity associated with an entrainment-free 2DU stream. Cyclic

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operation of the sampler jet by manual means showed that the activity of the first portion of a sample was much greater than the final, steady sample activity after five to ten minutes' operation. Therefore, cycle timers were installed to obtain automatic control of the sampler jet in such a manner, and preliminary evaluation indicates that the envelope of recorded activity peaks will give a qualitative picture of the variations in 2DU-overflow activity.

Demonstrated superiority of the new, rigid, stainless steel pH sample cells resulted in their adoption and permanent installation to replace old-style glass and Scotchcast models at both the caustic-addition and effluent-end samplers of the Pooled Waste Neutralizer at the TBP Plant. In addition, Chemistry Unit personnel furnished schematic flow and wiring diagrams and a complete sequence controller for the installation of a demand-type two-point pH buffering system. This will permit remote standardization of pH meters from the TBP Plant operating gallery, as required.

Installation of the T Plant pH instrumentation was completed during the report period. Operational checks of the installation, including the remote rinse and buffering system, were satisfactory. Preliminary investigations and consultations have been made of the feasibility and desirability of automatic pH control for TBP Plant neutralized aqueous wastes.

Shop drawings and work orders were submitted for fabrication of a gamma absorption photometer and associated components for the monitoring of uranium in UO_3 Plant calcination pot feed. A packaged Cs^{137} gamma source of the intensity required for this device has been requested from the Oak Ridge Radioisotope Sales Department.

Z PLANT PROCESS TECHNOLOGY

Wet Chemistry (Task I)

The porous Kel-F equipped filter sticks were removed from Cell 4 vessels when one unit collapsed at a hole in the backing plate. Both filter plates were covered with a fine black substance which had penetrated to the vacuum side. The in-line filter for filtering F-10-P solution performs satisfactorily when normal solids are encountered in the solution. On the otherhand, a short duration return to the N-1 filter was required when abnormal quantities of solids were encountered. These solids caused plugging of the in-line unit before a complete run was filtered. The cause for the formation of a white precipitate appearing when the peroxide cake was dissolved in nitric acid was traced to the presence of phosphoric acid in the 60 per cent nitric acid.

Dry Chemistry (Task II) and Reduction (Task III)

Based upon the fluoride powder color, 26.1 per cent of the runs entering Task II required rehydrofluorination. This compares to 25.7 and 25.2 per cent for August and September, respectively. The pink powders produced during October was 47 per cent of the total as compared to 32 and 25 per cent for August and September, respectively. Double batches accounted for 75 per cent of the runs processed. The average reduction yield was 98.5 per cent as compared to 98.7 and 98.6 per cent for August and September, respectively. Yields from six off-standard runs are included in this months 98.5 per cent yield figure.

Final Inspection

Rejections this month included three pieces with loose coatings, one piece with a blistered coating, one piece with a high alpha count and one positive electrolytic test. Rejections also included two assemblies which failed to meet the primary gap specification, one assembly that failed to meet the polar diameter specification and one assembly seizing on the primary surfaces.

234-5 DEVELOPMENT

Effect of Grease Components on Solvent Extraction Systems

The greases used in process equipment in the concentration building have been found to contain water-soluble, surface-active, organic compounds. The presence of these compounds in hexone-aqueous systems caused increased disengaging times, making necessary a pretreatment, such as washing with an inert solvent, to make F-10-P compatible with a hexone system. The compounds do not appear to affect carbon tetrachloride systems beyond causing an increased entrainment of organic in the aqueous phase.

Continuous Task II

Assembly of continuous Task II calcination and fluorination reactors has been completed except for installation of the hood panels. The screw conveyor feeders, vibrator drives, and electric furnaces have been tested on stand-in powders and were found to perform satisfactorily. The air, oxygen, and hydrogen fluoride gas supply systems remain to be calibrated before final cold testing of the equipment can be completed.

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Recuplex Development

Studies of various methods of valence adjustment of plutonium in F-10-P and Redox 3BP, for make-up as Recuplex feed, have shown that (1) the use of hydrogen peroxide, followed by sodium nitrite to reoxidize plutonium(III), should be satisfactory; (2) ferrous ammonium sulfate is effective, but is objectionable because it means the addition of sulfate to the solution; and (3) neither oxalate nor nitrite gave reduction of plutonium(VI) to (IV) in a reasonable length of time.

Studies of the Recuplex solvent extraction system have continued, giving the results that (1) increasing the system temperature to 40 C caused essentially no change in Ea values for the extraction column but reduced the Ea values for the stripping column by factors of 1.2 to 7.6; and (2) in batch contacts representing the dilute region of the stripping column, the aqueous phase plutonium concentration increased by as much as 30 per cent over a 15 minute contact period, indicating that equilibrium in this region is reached slowly.

Measurements of the specific gravities of a series of plutonium nitrate-nitric acid solutions have given the general relationship:

$$\text{Specific gravity} = 1 + 0.031\ (HNO_3 \text{ molarity}) + 0.35\ (\text{Pu molarity}).$$

Materials of Construction

Tests of the durability of six cements (Minnesota Mining and Manufacturing Company's EC-801, accelerator EC-807 and EC-1120, accelerator EC-1031; Phenoline 300; Pennsalt's Furan cement and Asplit cement; Barber-Webb Company's Paroline 1700) in simulated Recuplex waste solution (CAW saturated with CCl_4-TBP) have been made, with the conclusion that none is completely satisfactory. Of the six, Minnesota Mining and Manufacturing Company's EC-801 gave the best results.

Corrosion rates for weld-metal coupons of Haynes Alloy 25 were found to be, at the boiling point, 3.96 mils per month in 65 per cent HNO_3, 29.6 mils per month in 15.8 M HNO_3 - 0.14 M HF, and 24.9 mils per month in 2 M HNO_3 - 2 M HF. Corresponding corrosion rates for non-sensitized 309 SCb were 0.38 mils per month, 58.2 mils per month, and 81 mils per month, respectively. Exposure at higher skin temperatures (obtained by boiling the solutions in a Haynes 25 vessel on a hot plate) gave corrosion rates about double those listed above.

RECUPLEX CONSTRUCTION

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 78 per cent completed. Installation of the process pumps and agitators has commenced.

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Directive No. HW-279, Modification No. 6, authorizing the expenditure of an additional $118,000 for the Recuplex installation, was issued by the Atomic Energy Commission on October 22, 1954. Approval of the remaining $100,000 of the $218,000 requested by General Electric Company (for completion of construction, procurement of chemical storage vessels, and modification of nine process vessels) is not within the authority of the Hanford Operations Office and will therefore be submitted to the Washington D. C. office of the A. E. C.

ANALYTICAL LABORATORIES

General Chemical Laboratory - A temperature range of 300 C to 400 C is optimum for the determination of moisture content of uranium fluoride salts. This was determined by heating the salt to drive off water and then reabsorbing of the water on Anhydrone (magnesium perchlorate). Weight loss and water absorbed compare within one per cent in this temperature range; however, at higher temperatures there is a breakdown of the salt causing a weight loss in excess of water content.

A technique worthy of note has been developed for cleaning the small platinum dishes used in fluorometric analyses. Considerable trouble has been experienced in the past due to the difficulty of removing the last traces of uranium from the dishes during the cleaning process. Glass racks, slotted to hold seven dishes in such a manner as to eliminate dish to dish contact, have been made. Five racks of dishes can be cleaned at once. The frequency of dish rejection following the cleaning operation has been noticeably reduced.

Radiochemical Laboratory - Responsibility for the operation of the Plutonium Fission Counter was accepted from the Chemistry Unit and is now in use for the determination of Pu-240.

Fluoride analysis by the standard pyrohydrolysis method is incomplete for heavy metal fluorides containing alkali or alkaline earth metal. Intimate premixing with U_3O_8 prior to pyrohydrolysis was found to give proper fluoride recovery.

It has been found that direct sodium hydroxide titration of monobutyl phosphate (MBP) in a tributyl phosphate (TBP) matrix is readily possible to a lower limit of 0.5g MBP/l. Large amounts of dibutyl phosphate (DBP) do not interfere. If necessary the sensitivity could probably be increased by extraction of MBP in 10 per cent sodium carbonate.

Spectrochemical Laboratory - The arc-spark source enclosure for radioactive samples, referred to in last months report, is still under test for electrical current leakage. Progress is being made in this regard.

Mass Spectrometer Laboratory - Cracking pattern studies of liquid tributyl phosphate samples have been discontinued pending evaluation of data obtained.

Marked progress has been made and results are now being reported on the isotopic content of uranium samples analyzed by the 300 Area Consolidated Mass Spectrometer. Electronic troubles are still causing excessive downtime of this instrument.

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Conversion of a part of the 325 Building decontamination room to a Mass Spectrometer Laboratory is about 90 per cent complete. Moving of the 108-B Building Mass Spectrometer Laboratory will be started next month.

Water Quality Laboratory - The determination of iron in process water by the Bathophenanthroline procedure is still under investigation.

Work volume statistics for the Analytical Laboratories are as follows:

	September		October	
	Number of Samples	Number of Det'ns.	Number of Samples	Number of Det'ns.
Research & Development				
Applied Research	893	2162	903	2156
Pile Technology	265	1380	206	1992
Fuel Technology	40	456	112	1038
Separations Technology	934	1189	445	807
Process Assistance	72	334	56	223
Other Customers	91	277	99	2595
Total	2295	5798	1821	8811

INVENTIONS

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(s)	Title
M. H. Curtis	(HW-33415) "Reactor Fuel Decanning and Dissolving and Separations Process Feed Solution Preparation" (Mercury-catalyzed dissolution procedure for fuel elements.)
A. E. Smith	The use of Induction Heating for Heating Solutions in Glass Vessels.
B. A. Chandler W. R. Hamilton	A Valve for Use with Corrosion Gases or Liquids Incorporating a Teflon Bellows Seal and a Floating, Multiple Chevron (corrugated), Teflon seat.

V. R. Cooper

V. R. Cooper, Manager
Separations Technology Sub-Section

VRC:bp

November 8, 1954

APPLIED RESEARCH SUB-SECTION

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Applied Research Sub-Section

VISITORS AND BUSINESS TRIPS

Kenneth Street and W. J. Ramsey, UCRL, Livermore, California, visited Hanford October 12 to discuss metallurgical fabrication problems.

Eugene Lamb, ORNL, Oak Ridge, Tenn., visited Hanford October 18-19 to discuss HAPO experiments with remote handling devices and waste treatment.

Bruce W. Gonser, BMI, Columbus, Ohio, spent October 20 at Hanford for metallurgical consultations.

T. W. Evans and D. C. Kaulitz visited Phillips Petroleum Co., Idaho Falls, Idaho, October 5-7, to discuss Hanford slug irradiations.

W. J. Ozeroff, R. E. Heineman, H. Neumann, R. W. Woodruff, G. W. Stuart, C. R. Richey, E. D. Clayton, D. E. Davenport, B. R. Leonard, and D. D. Lanning attended the Reactor Physics Conference at ORNL, Oak Ridge, Tenn., October 12-15.

B. R. Leonard spent October 12 at ORNL discussing neutron spectrometry and D. D. Lanning spent the same date at ORNL discussing critical mass problems.

D. E. Davenport spent October 18 at the Electronics Associates, Princeton, N. J., discussing computing equipment and October 19-20 at BNL, Upton, N. Y., discussing exponential measurements.

B. R. Leonard visited ANL, Lemont, Illinois, October 18 to discuss neutron diffraction spectrometry and cross-section measurements.

D. D. Lanning spent October 18-22 at KAPL, Schenectady, discussing the operation of small reactors and October 25 at the Metals and Controls Corp., Attleboro, Mass., discussing fuel elements for the PCTR.

T. K. Bierlein presented a paper at the Light Microscopy Symposium by the Armour Research Foundation of Illinois, October 11-13 and the Twelfth Annual Meeting of the Electron Microscopy Society of America, October 14-16, both at Highland Park, Illinois.

F. W. Albaugh spent October 18 at BMI, Columbus, Ohio, discussing fuel element development programs; October 19 at Ohio State University, Columbus; October 20-21 at the University of Michigan, Ann Arbor; and October 22 at Michigan State College, E. Lansing, recruiting Ph.D. candidates.

F. J. Leitz attended a Thorex Information Meeting, October 19-20, at ORNL, Oak Ridge, Tenn.

W. R. Smith spent October 25 at Arcos Corp., Philadelphia, Pa.; October 26 at Rem-Cru Titanium, Midland, Pa.; October 27 at Babcock & Wilcox, Beaver Falls, Pa.; October 28 at Allegheny Ludlum Steel Corp., Breckenridge, Pa.; and October 29 at Crucible Steel Co., Midland, Pa., discussing development of corrosion resistant materials with the various manufacturers and development laboratories listed above. Mr. Smith attended the National Metals Congress, Chicago, Illinois, on October 30.

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L. A. Hartcorn and T. K. Bierlein attended the AEC Metallographic Committee Meeting at BMI, Columbus, Ohio, October 27-28, where Mr. Bierlein presented a paper.

T. K. Bierlein visited ANL, Lemont, Illinois, October 29, to discuss cathodic vacuum etching and electron microscopy. He also attended the American Society for Metals Seminar, Chicago, Illinois, October 30-31.

S. H. Bush presented a paper at the American Institute of Mining & Metallurgical Engineers, National Metals Congress, Chicago, Illinois, October 30-31.

ORGANIZATION AND PERSONNEL

Personnel totals as of October 31 were as follows:

	Exempt	Technical Graduates		Non-Exempt	Total
		Permanent	Rotational		
Physics Unit	26	0	0	7	33
Metallurgy Unit	43	0	2	25	70
Chemistry Unit	50	0	2	14	66
Administration	1	0	0	4	5
					174

CHEMISTRY

Uranium Recovery Process Solvent Stability

A specific method of chemical analysis for dibutylphosphate was devised and employed in a series of experiments designed to measure the rate of dibutylphosphate formation in synthetic RCU containing 0.25 M UNH, 0.05 M HNO_3, and 150 mg/l TBP.

The formation of dibutylphosphate was found to increase linearly at a rate of 13 ppm of uranium per 24 hours at 48 C. At 34 C, the dibutylphosphate concentration at the end of 66 hours was only 0.4 mg/l or one-fifth that produced in the same time interval at 48 C. Thus, the hydrolysis rate of tributylphosphate is extremely temperature dependent. In contrast to the temperature effect, increasing the acidity of the synthetic RCU from 0.05 M to 0.15 M HNO_3 had little effect on the rate of dibutylphosphate formation over a 27-hour test period.

The rate of dibutylphosphate formation in a two-phase system was measured by contacting a synthetic RCU containing 136 mg/l with a 20 percent TBP-Spraybase organic phase. The volume of the organic phase was quite small -- 4.5 percent that of the aqueous phase -- and was employed in order to simulate solvent entrainment in RCU. After 27.5 hours of contact time at 48 C, the organic and aqueous phases were analyzed and found to contain 1.05 and 22 mg/l dibutylphosphate, respectively. If it is assumed that the dibutylphosphate is transferred to the aqueous phase during steam stripping, the resulting aqueous would contain 2.0 mg/l or 34 parts dibutylphosphate per million parts of uranium. The results of this experiment demonstrate the desirability of removing any entrained solvent from the RCU stream quickly and efficiently.

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The analysis of degradation products in used plant solvent RCW has shown the presence of alkyl nitrite and nitrate esters. The radioactivity in used solvent appears to be associated with these nitro, nitrate esters and with acidic fractions arising from the diluent, but not with the degradation products of tributylphosphate as had been supposed earlier.

The reaction between Shell Diluent and nitric acid at room or elevated temperature apparently produces the same materials found in used solvent RCW, as evidenced by infrared spectra. The reaction rate is not only highly temperature dependent but is also nitrite dependent. The reaction rate at 70 C in the presence of 2.25 M HNO_3 increased several orders of magnitude on the addition of 0.01 M HNO_2, but an excess of urea was shown to completely inhibit this fast reaction. Nitration products of Shell Diluent were separated and submitted to Chemical Development for use tests. Definitely harmful effects were shown in that 40 parts of the nitration products per million parts uranium caused foaming during UNH calcination, four percent mixed in RAX raised the "C" contact uranium distribution from 0.005 to 0.28, and increased the fission product activity retention in the solvent 500 times above normal. Other tests showed that solvents containing nitration products could not be cleaned up by washing with sodium carbonate solutions. Efforts to find a diluent more resistant to nitration and to find means of destroying these nitration products are continuing.

Radiation Damages to Purex Solvent

To test the effect of an aqueous phase on solvent irradiation damage, two-phase mixtures of 30% TBP in carbon tetrachloride and synthetic HAFS were irradiated for various lengths of time under constant agitation. Similar experiments were performed using Shell Spraybase as a diluent. The chloride and dibutylphosphate yields obtained were comparable to those obtained for single phase experiments, indicating no unusual effect. A uranium stripping test indicated normal C column operation is to be expected for exposures as high as 10^5 R.

Waste Treatment

High intensity radiation appears to have a deleterious effect on the scavenging of cesium from Uranium Recovery RAW. This effect may become important if fresh material from B and T plant is processed during the 4X program. Nickel ferrocyanide scavenging of simulated RAW followed by ten days' standing of the resulting slurries gave cesium decontamination factors for the unirradiated control and for material exposed to a $Sr\text{-}Y^{90}$ beta radiation source of 1200 and 260, respectively. The beta source intensity was 1.5×10^6 ergs/ml-hr (0.04 watts/l), approximately that expected for fresh RAW. The observed reduction in cesium decontamination is about the same as that previously reported using the 100-F basin gamma radiation facility and is to be compared with a decontamination factor in the order of 500 desired for cribbing.

Plant test of the nickel ferrocyanide scavenging of current Uranium Recovery waste is now in progress. Cesium decontamination has been very effective, the Cs-137 concentration of the cribbed waste being less than 10^{-2} μ/ml. Some difficulty with pH adjustment has been experienced, leading to poor strontium decontamination when the pH falls below eight.

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Thorex Process

Addition of phosphate to the aqueous phase in the 1A column has been incorporated in both the ORNL acid-deficient and the KAPL acid Thorex flowsheets in order to complex protactinium into the 1AW stream. Even with head-end recovery of protactinium, such further separation is required to achieve adequate decontamination of the product streams from protactinium. The nature and strength of the protactinium-phosphate complex has recently been established by determining the distribution coefficient of protactinium in a 5 M HNO_3-50% TBP system as a function of total phosphate concentration. The observed decrease in protactinium distribution into the organic phase with increased phosphate concentration can be explained assuming a single protactinium-phosphate complex having a negligible organic solubility and containing one phosphate per protactinium atom. The formation constant for the complex in this system has the raw value 3×10^3, ignoring such factors as acid complexing of phosphate and activity coefficients. Further study of this complex is planned as a function of hydrogen, thorium and aluminum ion concentrations, all of which are prospective constituents of Thorex feed solution and competitors with protactinium in phosphate complex formation.

Ruthenium Studies

Any volatilization of ruthenium occurring during nitric acid recovery from Purex aqueous wastes should be substantially suppressed by the addition of nitrite to the system, according to recent laboratory experiments. Addition of 0.05 M $NaNO_2$ to concentrated nitric acid containing 1.2×10^{-2} M "volatile Ru", followed by digestion for 30 hours in a closed system, yielded a solution whose nitric acid distillate contained only 2×10^{-6} M Ru. Without nitrite addition, essentially all of the "volatile ruthenium" redistills. Volatilization of ruthenium from lower nitric acid concentrations to simulate flowsheet conditions are under investigation, with and without nitrite addition.

Extension of the time of heating to 150 C from 1/2 to 4 hours produced no further improvement in ruthenium decontamination in studies of the effect of ozone sparging during calcination of unheadended concentrated 1CU. Over this range of heating times, a ruthenium decontamination factor of about three is obtained on heating up to 150 C. Above this temperature ozone rapidly decomposes; however, an additional ruthenium decontamination factor of about ten is obtained on heating to 460 C. Thus, total ruthenium decontamination factors of about 30 and 10 are obtained during calcination with and without ozone, respectively.

Flurex Process

Additional Flurex Process (direct conversion of uranyl nitrate to uranium tetrafluoride by electrolytic reduction) runs have been made producing sodium uranic fluoride ($NaUF_5$). These runs were made to establish whether the less expensive sodium salt would be as satisfactory as the potassium salt. Using an old model electrolysis cell, a run with over 80 percent current efficient was obtained; repeat runs on a new model cell have given less than 20 percent current efficiency. The low efficiencies have been traced to a short circuit in the new cell. The product in all runs is similar to the potassium salt obtained in previous work and is composed of dense, compact, easily centrifuged and washed crystals. Bomb reductions on both the sodium and potassium salts are pending.

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Isotope Separation

Mass spectrometric analyses of samples from the thermal diffusion column run reported last month showed no significant change in the isotopic composition from natural uranium. These samples had been analyzed previously by a tracer technique that showed a large apparent separation. It appears that tracer analyses must be interpreted with extreme caution in isotope separation experiments to avoid misleading conclusions.

A new stainless steel thermal diffusion column was placed in operation this month. A run using aqueous uranyl nitrate in dilute nitric acid was completed; no analytical data have been obtained to date. This run emphasized a major difficulty in making thermal diffusion experiments on solute-solvent systems; a steep uranium concentration gradient is developed as a consequence of the Soret effect. This leads to the undesirable result that the concentration of the uranium at the top of the column (where the light isotopes are expected to concentrate) decreases to well below one gram per liter. The dilution of the uranium makes it necessary, in order to avoid materially disturbing the column equilibrium, to sample daily over a period of two or three days to accumulate sufficient material for a mass spectrometric analysis.

Heavy Element Chemistry

The apparatus and techniques for the neptunium-239 experiment are being assembled and tested. The equipment for the introduction of the sample into the pile, and for the withdrawal from the pile has been tested, and found satisfactory, except for a water pump which will have to be replaced with one of larger capacity. Only a few parts remain to be fabricated before installation of equipment can be initiated at the pile site.

Very thin and uniform deposits of plutonium on disks are required by Physics personnel for their neutron spectrometer studies. The Chemistry Unit has undertaken the responsibility of preparing these special disks. In order to determine precisely the uniformity of plutonium deposits prepared by electrodeposition, an autoradiographic technique is being investigated. Source holders of known geometry are being used to calibrate a nuclear emulsion film required by the technique, so that a series of standard densities of film darkening will be available.

Analytical Development

An extraction method for dibutylphosphate in organic samples which concentrates the DBP by a factor of 10 was developed, and revised analytical procedures for dibutylphosphate in both aqueous and organic samples have been issued to the 200 Areas control laboratories. In addition, a subject report, "The Determination of Dibutylphosphate," has been issued as HW-30643, Revised.

In support of a proposed study of the distribution of mercury in the Redox Process, analytical methods were required for mercury in many process samples. Some difficulty has been encountered in the application of the usual methods to recycled hexone solutions. A study of this problem revealed that the recycled hexone contains an impurity which oxidizes some of the reagent, dithizone. This results in

a reagent blank absorptivity which varies from sample to sample and thereby produces inaccurate results for mercury. Although a reducing pretreatment of the sample with sulfite was found to virtually remove the interfering impurity, a better solution to the problem, which is more rapid and accurate, involves measurement of the absorption at a different wavelength which is not influenced by the reagent concentration. A satisfactory procedure has been prepared for the determination.

The plutonium in ten microliter samples of a Redox Process dissolver solution was determined by coulometric titration using a preliminary separation of the plutonium by precipitation of plutonium(III) fluoride on lanthanum fluoride. The results (ave. 0.297 g/l) agreed closely with the value obtained by radioassay of the solution (0.305 g/l), and show a standard deviation of ± 1.2% for a single result. Radiation exposure to the analyst was less than 8mrep per sample. This work confirms the results obtained previously with snythetic dissolver solutions, and concludes the investigation on the coulometric determination of plutonium. A final report on the investigation is being prepared.

A spectrographic method was developed for the determination of zirconium in pile cooling water in order to support studies of zirconium in-pile corrosion rates. The method uses the porous cup procedure reported last month. With a detection limit of about one ppm and a precision of ± 20% at ten ppm, pile water samples need to be concentrated by a factor of about 250 before analysis. Techniques for improving sensitivity are under study.

In research on an ion exchange method for concentrating the metallic impurities in water, a study involving aluminum, copper, and ferric ions showed that yields were good for aluminum and copper, but iron is not always retained on the resin (Dowex-50) at concentrations in the part per billion range. This is believed to be due to the hydrolysis of the ferric ion to a nonionic hydrous oxide. Methods for overcoming this problem are under investigation.

A measurement of the influence of slug diameter on gamma absorption by "C" slugs was completed. The data provide correction factors to be used in routine assay for uranium in "C" slugs by the gamma photometer. Within the range of 3.5 to 4.5 percent uranium, and 1.332 to 1.364 inches diameter, the correction is +0.0105% of uranium per mil of diameter deficiency (versus the standard slugs).

Miscellaneous analytical development activities included the determination of the ionization cracking patterns in an analytical mass spectrometer of tributylphosphate, diethylbutylphosphate and triethylphosphate. These patterns will be used for comparison with those to be obtained from samples which have been subjected to radiation.

Analytical assistance was supplied to 100 Area control laboratories in revisions to the Manual of Standard Analytical Methods, Reactor Section, Document HW-30589, to Separations Technology Analytical Laboratories in mass spectrometer trouble-shooting and data interpretation, to Recuplex studies in testing lubricating oils for deleterious additives by infrared spectroscopy, and to research activities in sorting out depleted uranium samples by the rapid spectrographic method reported last month.

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The standard sample program involved 71 determinations in 100, 200, and 300 Area service laboratories. These included test samples of simulated river water for 10 elements; of plutonium for Chemical 70-58; of plutonium nitrate for specific gravity and plutonium by two methods; of five organic uranium solutions (HAP) for uranium; and of UO_3 for seven metallic impurities. Results in all cases were quite acceptable.

In-Line Analysis

Most of the components required for in-line analytical instrumentation in the Hot Semi-Works are ready for installation. The electrical wiring for these instruments in the 201-C Building is about 40 percent complete and the plumbing installation has been started. The plumbing associated with gamma monitors, including valve assemblies, gamma cells, degassers, and hold-up cups, has been assembled, leak tested, and delivered to the Hot Semi-Works for installation. Assembly and testing of the solution flow lines and cells for uranium photometers, polarographs, and pH units are about 90 percent complete. Several installations require solenoid valves which use Teflon or fluorothene rather than neoprene for seats, because of contact with organic solvents. Since Teflon and fluorothene are relatively hard, they do not seat well and stiffer springs have to be installed in the valves to reduce leakage to tolerable levels. An investigation of several alternate seat materials failed to yield an acceptable substitute.

The polarographic and pH sensing units are ready for use, and the fabrication of photometer sensing units (two types) is about 90 percent complete. The pH console has been tested and is satisfactory, the polarographic console has been fabricated but testing is not complete, and the uranium photometer consoles are about 70 percent complete.

A commercial constant current power supply was received and in the laboratory tests it proved to be applicable to the photometer light source control problem, having a stability adequate to control the photometer signal to within ± 0.5%.

In further studies of the colorimetric determination of uranium in organic Purex streams, the influence of the color of recycled solvent was considered. The progressive yellowing of TBP-Shell Spraybase extractant constitutes an interference in the uranium determination. Although the recycled extractant (at 100 receiver) will be monitored for yellow color, only a partial correction can be made since a remaining source of error is that the extractant has a more intense color after contact with sodium carbonate in the 10 column than after the acidic contacts in A and B columns. Studies this month revealed that the extractant contains variable amounts of at least two yellow constituents; one of these constituents behaves like a base indicator, becoming yellow upon contact with an alkali such as sodium carbonate. Therefore, the monitor for color at the 100 sampler, reading just after a carbonate scrub, will give high and variable results. A study including tests of the acid-base response of several samples of used extractant showed that the error in the correction factor for the uranium value will probably be as high as ± 5% of the uranium value.

Research on the use of solid micro electrodes for uranyl nitrate polarography resulted in elimination of the previous difficulty with varying hydrogen overvoltage by using an amalgamated gold electrode, and by incorporating an anodic

treatment for a fraction of each cycle. Sensitivity of the electrode is comparable to that of a dropping mercury electrode, and it varies directly with the electrode area and the stirring efficiency. The stirring is accomplished by bubbling helium gas through the sample which also frees the solution of oxygen. The Purex waste composition (HAW) permits a useful range of 0.04 to 0.8 g/l uranium, with linear response, and an electrode has been running polarograms on a synthetic HAW continuously for eleven days without evidence of loss of sensitivity or other electrode failure. Polarograms of uranium can be obtained on Metal Recovery Plant waste (RAW) in the range of 0.11 to 2.5 g/l without stirring or inert gas sparging. No life tests have been run on RAW as yet.

The in-line pH monitors in the Metal Recovery Plant waste neutralizer were modified during the month to increase reliability in support of the cesium scavenging process. The controllers were redesigned and fabricated to enable the standardization of the electrodes by automatic introduction of buffer solutions at either pH 7 or pH 10 upon demand. It was recommended that these controllers be installed in the operating gallery rather than in the canyon. During the month a subject report entitled "pH Monitoring of Metal Recovery Neutralized Waste" has been issued as Document HW-33148.

Design details for the pH monitoring installations in the Purex plant are about 90 percent complete. Five units will be required, some of which will be used manually and intermittently for batch neutralization of wastes. In addition to waste neutralization, the solvent treatment process will be monitored for pH.

Other in-line activities included assistance to Separations Technology personnel in the installation of a gamma monitor in the Redox Plant and in the design of a pH monitoring system for the waste neutralizers in the Bismuth Phosphate Plants, design and fabrication of a testing instrument for troubleshooting in-line photometer sensing units, incorporation of a four cycle logarithmic counting rate meter in the Hot Semi-Works gamma spectrometer to eliminate the need for range switching during a gamma energy scan and provision for a pulse generator to calibrate the counting rate meter. One of the aluminum gamma monitor sample cells was tested for ease of decontamination using a process sample of about 3000 microcuries per liter. A flush with dilute acid and water after the test resulted in complete decontamination.

Laboratory Decontamination and Waste Disposal

A test modification was made in three filter canopies in the basement of the Radiochemistry Building. This included the insertion of an 8" venturi tube in the duct above the C.W.S. filter and a similar tube below the filter. By attaching an instrument to these tubes, the pressure drop across the filter can be read directly. Pressure drop data were collected when two old filters were removed and new filters installed. On the basis of the data obtained the predicted life of the average filter is somewhat greater than one year. Cost of individual filters is approximately $60. It appears that this method of checking the air flow is more convenient and speedy than a check of face velocities at the hood openings in the laboratories. A similar modification of the other filter canopies is planned in the near future.

Sixty thousand gallons of "cribbing" waste were transported to 200 West Area for disposal.

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One million gallons of retention level waste were processed to ground.

A limited use equipment supply room was set up in Room 11-3B. It is being used primarily as a display room and an emergency source of supply. Three deliveries a day from Central Stores have been started, and deliveries within Building 325 are being made by Stores personnel.

All other decontamination, laundry, and building service functions were accomplished in a routine manner.

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Irradiation Effects

The remaining twelve assemblies in the study of various types of preferred orientation irradiation stability have been discharged from the pile prematurely because of an assembly rupture. This completes the exposure of the sixteen assemblies required for this production test, and the uranium specimens will be examined and given physical measurements as soon as possible. Although the cause of the failure has not been completely ascertained at the present time, it is interesting to note that this ruptured assembly contained the uranium which possessed the highest preferred orientation of any of the samples exposed.

Metallurgical Techniques

Necessary calibrations and calculations for conducting in and out-of-pile experiments on the diffusional behavior of U-Al sandwich couples are continuing. The couples currently being prepared for MTR irradiation consist of a U-Al-U-Al-U sandwich; this arrangement provides a symmetry which will permit prior calculation of expected temperatures at various positions in the U-Al interfaces. Temperature monitors in the form of low melting alloys will be introduced in one of the uranium disks and after irradiation will provide a means for checking the calculated temperature distribution within the sandwich assembly. Since the sandwich assembly will be constrained mechanically, tests have been conducted to determine semi-quantitatively the torque required to produce a mechanical loading of 2 tons/in^2 at room temperature. This loading should be sufficient to maintain interfacial contacts and permit diffusion to occur at axial temperatures of 450 C. Heat transfer calculations indicate that for the geometry and compositions used, a flux of 7.5×10^{13} nv will be required. Such a capsule will be filled with NaK and the diffusion disks as soon as the NaK canning facility is in operation. In order to establish the validity of such an in-pile test, an out-of-pile test performed under similar conditions is being conducted. In this study, accurate control of annealing temperatures is possible. The furnace and ballast arrangements provide a temperature constancy of ± 1.3° at a nominal temperature of 450 C within a time period of 64 hours. The out-of-pile test will provide a necessary standard state for comparison with the in-pile experiment.

Fuel Element Studies

Two of the four mechanically bonded fuel elements being irradiated in the central zone of D Pile have been discharged after 400 MWD/T and are in the process of examination in the Radiometallurgical Laboratory. No evidence of preferential

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or non-uniform corrosion has been found in the vicinity of the point closure on either slug although one slug was somewhat pitted on the base end cap and side wall. Similar pits have been observed on AlSi canned fuel elements. The cap and base of one slug have been removed. Visual examination of the slug ends revealed nothing indicative of diffusion or interaction between the uranium slug and aluminum cap or base. The two pieces remaining in D Pile have reached an integrated exposure of 500 MWD and are scheduled for discharge at 600 MWD/T.

The two four-inch mechanically bonded fuel elements which were irradiated for approximately seven weeks in the pressurized H Pile facility have been examined using the underwater viewer in the DR pile basin. No preferential corrosion could be observed in the vicinity of the point closure and no unusual slug surface conditions were noted which would indicate unsatisfactory performance of the slugs. These slugs had accumulated an exposure of approximately 200 MWD/T with coolant temperature of 130-140 C. The pieces are scheduled for further examination in the Radiometallurgical Laboratory.

Unbonded slugs, canned by the room temperature point closure technique, are being tested to determine their rupture resistance and to determine whether a uranium to aluminum bond is essential for heat transfer requirements under Hanford conditions. Two unbonded solid slugs were charged in C Pile September 16 and were discharged October 26; the tubes operated normally during the test period. Slug AR 14, charged at the center line, operated a maximum specific power of about 47 kw/ft and accumulated an exposure of about 280 MWD/T. Slug AR 13, charged at the downstream end of the tube, operated at about 9 kw/ft and accumulated an exposure of about 56 MWD/T. These slugs were examined in the 105 C viewing basin October 26. Underwater examination indicates that the slugs were in good condition except for three or four pits which were observed in the base of each slug. The pitting was apparently not dependent on specific power, since the slug operating at low power was pitted to about the same extent as the slug that operated at the higher power. There were no apparent burned spots or other evidence of non-uniform heat transfer on either slug. The 400 MWD/T goal exposure unbonded slugs and the 625-750 MWD/T unbonded slugs were charged in H Pile September 30. The tubes are operating normally, the slugs having accumulated exposures of about 100 MWD/T.

Since the 200 MWD/T slugs from C Pile showed no evidence of gross damage resulting from pile exposure, a tube charge of 36 unbonded cored natural slugs and 4 unbonded cored enriched slugs will be charged in C Pile. A sufficient number of slugs to make up this charge had been prepared; however, upon completion of metallographic and x-ray examination of the slugs involved, it was found that 19 our of 41 natural uranium slugs had preferred orientation values too high to allow their inclusion in a tube charge to be irradiated to rupture. Additional uranium was examined (see "Quality of Production Slugs") and acceptable slugs machined to replace the defective material. Charging of this tube charge is tentatively planned for November 22.

Five natural uranium slugs, insulated from the aluminum jackets with a Martin hard coat anodic layer on the sides and zirconium wafers on the ends, were canned by the cold closure technique with a modified cup. To date, one cored and two solid slugs have been canned in cups with 0.001 inch insulating layers and two cored and two solid slugs have been canned in cups with 0.003 inch insulating layers. During November the present insulated slug program including solid and cored natural uranium slugs with insulating layers of 0.001, 0.003, and 0.005 inches, and cored enriched slugs with insulating layers of 0.003 and 0.005 inches should be readied for pile charging.

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The objective of increasing rupture resistance in Hanford fuel elements has induced a paper study of the feasibility of radically different geometrical configurations. A bundle six small rods operating at high specific power has been considered. In addition, a study of plate-fuel elements, which are characterized by low temperature drops, has been initiated. The temperature distributions in plates and strips having prescribed surface temperatures or Newtonian boundary conditions have been determined. The results of these calculations, which include the development of the equations for the temperature distributions, will soon be published in an unclassified report.

Quality of Production Slugs

As a consequence of discovering that a number of slugs intended for a production test were unsuitable because of marked preferred orientation, 81 additional regular production slugs were picked at random from the canning line and subjected to x-ray examination in order to obtain replacement slugs. The x-ray results disclosed a condition that appears relevant to current production operations. A substantial fraction of the 81 slugs possessed a very pronounced [100] type of preferred orientation which in many cases varied along the radius of the fuel element. On the basis of past tests and experiments, fuel elements with this type and degree of orientation may be expected to be dimensionally unstable during irradiation under the present conditions of pile operation. A prediction can be made to the effect that slugs possessing a high degree of [100] preferred orientation will shorten in length and increase in diameter. In addition, in the cases where the orientation values for the [100] planes are much higher at the center than at the periphery, a dishing phenomenon can be expected to occur. The production slugs from the 81 specimens chosen had all been beta heated in rod form.

MTR Fuel Element Testing Facility

The first three slugs to be irradiated in the testing facility were scheduled for discharge October 18 at an exposure of approximately 550 MWD/T. During the week of October 10, however, fission product activity was detected in the effluent water of the reactor and since that time the reactor has been operated intermittently at 10 or 20 MW while attempts were made to find the source of the trouble. The Hanford A-block was still in the reactor at the end of the month. It is not known at present when the MTR will resume normal operation except that it will not be before mid November.

Scheduling conflicts arose about October 1 when Hanford was informed that it would be necessary that the fuel element specimens be charged in B-blocks rather than in A-Blocks. Design and fabrication of a B-block was started immediately in an attempt to have it ready for the scheduled November 8 shutdown. The two charged A-blocks were shipped back from the MTR, cut open and the slugs removed and transferred to the B-block and it was shipped to the MTR on October 20. The fuel elements will operate at a power level of approximately 75 kw/ft in the position allotted for this experiment.

Fuel Material Studies

The first four zirconium capsules containing uranium-magnesium fuel material have been decanned and bend tests have been performed on the specimens in the Radiometallurgy Building. These samples were irradiated in the MTR facility for 773

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hours in an average flux of 8.75×10^{13} nvt or the equivalent of about 934 MWD/T. Visual examination of the pieces showed that no distortion had occurred and the ease with which the pieces were decanned indicates that the material is dimensionally stable. Their appearance after irradiation was the same as before they were charged into the reactor. Four of the capsules remaining in the MTR now have an exposure of about 2500 MWD/T and will be discharged at 5000 MWD/T in December. The other four now have an exposure of about 5000 MWD/T and will be discharged at 10,000 MWD/T in January.

Bend tests were completed on two types of U-Mg fuel material in both the unirradiated and irradiated conditions. The samples were all of one-inch gage length and 0.401 ± 0.002-inch diameter. The first type, which contained only U and Mg, failed at loads ranging from 335 pounds to 450 pounds with deflections from 0.011 to 0.015 inches in the unirradiated condition. Similar irradiated samples failed at loads ranging from 1110 pounds to 1530 pounds with deflections from 0.009 to 0.010 inches. The second type, containing silicon in addition to the U and Mg, failed at loads varying from 360 to 926 pounds with deflections from 0.012 to 0.018 inches in the unirradiated condition. The irradiated samples failed at loads varying from 850 to 1180 pounds with a deflection of 0.010 inches. Difficulty was experienced in removing the samples from the zirconium jacket because of insufficient clearance between sample and jacket.

Two uranium-magnesium fuel elements have been made using uranium shot that was received from the Mallinckrodt Chemical Company. The fuel elements contain 64 volume percent uranium in a magnesium-silicon alloy matrix. The slugs will be canned in Zircaloy-2 cans and one will be exposed in the MTR to the equivalent of 5000 MWD/T. At the end of this exposure, the sample will be examined metallographically and also for dimensional stability. These slugs are 0.880 inches in diameter and 4.0 inches long. They will be canned in Zircaloy-2 cans with a 0.025-inch can wall which will be sized onto the slug and a cap welded in place. This will be followed by autoclaving in 100 psi steam for 150 hours. The slug to be irradiated in MTR will be located adjacent to the active lattice where it will be subjected to an unperturbed flux of about 1.4×10^{14} nvt or an effective flux of 1.1×10^{14}nvt. In this position, it will be generating about 45.2 kilowatts per foot which is 6.2 kilowatts per cubic inch of element or 9.7 kilowatts per cubic inch of uranium. Fifty kw/ft in a slug of Hanford geometry is equivalent to 2.9 kw/cubic inch of uranium. The core temperature will be 500 C for this power generation. This sample will accumulate exposure at the rate of about 20 MWD/T per day. It is also planned to make reactivity measurements on this material before irradiation.

Impurities in the available thorium metal used in preparing thorium-uranium alloy melts has caused difficulties in the interpretation of the metallographic structures of the cast, wrought, and heat treated alloys. High Si and Fe content of the thorium is believed responsible for these difficulties. With the proper use of etchants and microscope magnification, the thorium-uranium eutectic may be delineated from other constituents and its distribution following various metallurgical treatments is being studied. Tentative planning in the thorium-uranium alloy investigation include MTR exposures of capsule specimens of several metallographic structures to 1000, 5000, and 10,000 MWD/AT followed by radiometallurgical examination and evaluation.

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Zircalloy capsules containing UO_2 have been prepared for irradiation in the MTR at various fluxes, exposure times, oxide densities, and 235/238 ratios.

Zirconium Metallurgy

Two water cooled annulus tube modifications to a process tube are scheduled to be installed in 100-F pile in November and loaded with zirconium specimens to study the effect of pile irradiation on the reaction between zirconium and pile gas. One of these charges of four heater assemblies has been tested in a mock-up tube and found to operate satisfactorily. The relationship between the equilibrium temperature of the zirconium test specimens and the amount of heat generated in the core was established by applying known power to the heater resistance elements while the charge was in a water cooled mock-up tube. From these data, knowing the weight of the heater cores, good values for gamma heating of stainless cylinders versus pile power should be obtainable from measured temperatures of the in-pile specimens. If the gamma heating of stainless steel is assumed to be 0.2 watts per gram, exposure temperature between 300 C and 450 C can be maintained satisfactorily.

Weight gains of zirconium and Zircaloy-2 exposed out of pile in dry CO_2 at 650 C have been observed until the scale started to fall from the specimens. Zircaloy-2 gained weight at a nearly linear rate of 22.5 $mg/cm^2/100$ hrs., and zirconium gained weight at a rate of 2.4 $mg/cm^2/100$ hrs. The rate of reaction of these materials with CO_2 at 650 C is about the same as it is with air at 650 C. A rough extrapolation of the in-pile data indicates that the Zircaloy-2 gains weight at an average rate of about 4.0 $mg/cm^2/100$ hours which is only 20 per cent of the out of pile rate. The in-pile specimens also maintain a bright surface free of corrosion products. Since the Zircaloy-2 specimens exposed in-pile were contained in a quartz tube, it was hypothesized, to explain this difference in behavior, that an in-pile phenomenon could coat the specimens with a silica film. Silica films were therefore placed on zirconium and Zircaloy-2 specimens by evaporation, and these specimens exposed out of pile to CO_2 at 650 C. The reaction proceeded at the same rate observed in the absence of SiO_2 coating, the coating remaining undisturbed as the reaction product formed underneath. It appears that formation of a SiO_2 coating on the zircaloy exposed in the "F" pile does not explain the unscaled surface observed on these specimens.

Data have been accumulated on the weight gain of zirconium and Zircaloy-2 in air at 500 C as a function of gas velocity. Specimens prepared from 0.06 inch 65 per cent cold worked sheet were put in tube furnaces with air velocities of 0, 3, 5.5, 11, and 22 feet per minute. During 500 hours exposure the reaction rate of both zirconium and Zircaloy-2 has been independent of the air velocity. The weight grains of the zirconium specimens have approximated a cubic law as have the zircaloy samples during the initial seventy hours; following this induction period, however, the weight has increased linearly with time.

Zircaloy-2 impact and bend test specimens exposed at 150 C in the "H" loop from August 6, 1954 to September 28, 1954 are available for testing by Radiometallurgy. The impact specimens contain about 20 ppm hydrogen and have pre-irradiation Charpy impact strengths changing from 23 ft. lbs. at 100 C to 47 ft. lbs. at 250 C.

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Uranium Reduction Studies

The preparation, decomposition, and reduction studies of ammonium uranium fluoride have been concluded. This salt is easily filtered, centrifuged, and washed. Solubility losses during these operations are not excessive. Iron contamination in the final uranium metal has averaged 600 ppm and reduction yields on a 20 gram scale are about 80 per cent. The yields should be increased to above the 95 per cent level with further development. X-ray patterns have shown that $UF_4.CaF_2$ is a true double salt and not a mixture of the two fluorides. The molecule is apparently hydrated which will necessitate a dehydration step prior to bomb reduction to the metal.

Double salts, such as $UF_4.CaF_2$, $UF_4.MgF_2$, $UF_4.NaF$, $UF_4.KF$, which can be prepared directly from UNH solutions, may prove valuable in several respects. Aside from the conventional bomb reduction techniques these materials would be suitable substitutes for UF_4 in several proposed reduction procedures as the moving-bed reactor or continuous green salt reduction process. The advantages the double salts offer are low preparation costs, both in equipment and in feed materials, ease of preparation and handling, and essentially complete elimination of corrosion problems which are serious in the preparation of UF_4. Since the precipitation reaction is carried out at low temperature the reactors could be either fabricated from or lined with any number of materials which will not be attacked by solutions containing fluoride.

Radiometallurgy Examination

Incomplete metallographic examination of the first group of cold worked zirconium samples in a production test to determine the influence of prior mechanical cold work on changes occurring during irradiation indicated that there was no change in the material due to the irradiation detectable in a metallographic examination. The second group of samples to be discharged was delivered to the Radiometallurgy Building where they were uncanned and visually examined. No unusual surface conditions were noted.

One cylindrical, powdered metallurgy uranium specimen which had operated at a calculated temperature of 800 C was lapped and the average hardness measured. A uniform increase of 8 points to 93 R_G was observed over the length of the sample.

A study of the changes occurring in uranium fuel elements was conducted upon samples sectioned from an 8-inch beta heat treated slug which had received an exposure of approximately 520 MWD/T. Longitudinal samples with approximate dimensions of 1/2" x 3/8" x 1/8" were obtained and mechanically polished to a uniform cross section. Bend strength tests on two samples whose maximum stressed fibers were located along the slug axis and at 3/8-inches from the slug axis indicate an increase in bend strength from 110,000 psi to 124,000 psi respectively. The bend strength decreased approximately 40 per cent from 196,000 psi which was obtained for a non-irradiated sample. The longitudinal location of the maximum stressed fibers was 2.4 inches from the cap end of the uranium. The modulii of elasticity of the irradiated samples was 18×10^6 psi as compared to 12.3×10^6 for the non-irradiated specimen. A hardness traverse on a transverse sample sectioned 3 3/4 inches from the uranium cap end showed an increase in hardness from 90 Rockwell G

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at the slug center to 94 R_G at the outer edge. A uniform average hardness of 93 R_G was obtained over the length of the bend test sample cut 3/8 inches from the slug axis. However, hardness values on the centrally located bend test sample appear to show an increase in average hardness from 91 to 95 at distances of 3 1/4 inches and 1 3/4 inches from the cap end respectively.

Work on the one ruptured and three unruptured slugs from a test to evaluate the effect of irradiation on cored Ike slugs included sectioning, length measurements, molding, and hardness measurements. On a transverse section of the rupture there were numerous small cracks and one main split which opened to the 3/8 inch core at the slug axis. Very little corrosion had taken place in the core. The three normal pieces were cracked the length of the slug on opposite sides of the core. These cracks started at the core and extended to the outer fibers on sections at the center of all slugs. On longitudinal sections obtained over half the length of two of the normal slugs minor deformation of the core outline and numerous small cracks in the uranium were seen. In cutting the cap and base from two of the unruptured slugs it was evident that no bond existed between the end of the uranium and the cap on either of the slugs. Incomplete bond between the slug sides and jacket could be seen on sections. Rockwell hardness readings obtained on a cross section of one unruptured slug indicated a drop in hardness between the periphery and core of the slug of 20 Rockwell G points - similar to the pattern of hardness on a slug known to have been heated to the beta phase temperature zone at the center. The hardness pattern obtained on a section of the rupture indicated the possibility of more heating in this piece than in the others. The average Rockwell G number was about 80 with none of the values in the range 90-95 R_G usually observed on regular uranium. An etch pattern developed in cleaning the cut surfaces with an HNO_3 electrolyte showed concentric zones of shading indicating a variance in chemical reactivity between the outer fibers and the core of the slugs. No appreciable dimensional changes from uranium growth were observed.

A section through the principal areas of corrosion on the thorium slug which failed on April 22, 1954 showed the corrosion to have taken place in discrete areas rather than over a large area and gave evidence that some mechanism other than a simple reaction between the Th and pile water may have been involved in the failure. There were cracks present in the thorium metal that did not appear to result from corrosive action. Hardness measurements obtained in a cross section of this slug were fairly uniform across the section and indicated an average hardness of 68 Rockwell B.

Further examination of the enriched fuel slug rupture, No. J-18, which had suffered some melting of the jacket over an area of about 1 sq. inch revealed that some melting on the surface of the U-Al alloy slug had taken place. Fused metal was intermixed with the oxide which covered the alloy surface. Additional chemical analyses of the jacket metal are being obtained to check the one analysis which indicated a 10 per cent cadmium content at one point in the fused area of the jacket.

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One 8-inch Truline slug from PT-24M was examined and the dish in the base and cap ends measured. The slug fractured transversly at a pronounced necked down area near the center of the slug after being dropped in the 105-basin five times. A second necked down area was observed at the cap-slug junction, however, it was not as pronounced as the one near the center. The cap was removed and appeared to be poorly bonded. The base and cap ends were observed to be dished 0.020 inches and 0.026 inches respectively.

The caps were removed from two more hot pressed J3 slugs (J3-C48-33 and 53-C48-48). Examination after cleaning in nitric acid revealed no evidence of corrosion or water penetration at the diffusion weld closures of either cap. Two relatively large areas of pitting attack were observed near the edge of the cap from slug #33, however, this attack may have occurred during the three month period they were stored in the 327 basin.

Failure #376 (cap type) from a production test to evaluate slugs formed from beta treated rods was examined and measured. The cap assembly was completely separated from the slug and the can wall was necked down at the point of failure which was approximately 1/8 inch below the end of the uranium core. A hole approximately 1/2 inch in depth, was located in the central area of the exposed end of the uranium. The base was removed and the dish in the end was found to be 0.31 mils. The cap end also appeared to be dished. The length of the uranium was measured 1/2 inch from the center and the average length was 8.360 inches.

One irradiated slug from a production test to measure the thermogalvanic effect on slugs was observed and photographed. No evidence of corrosive attack due to thermogalvanic effects was detected. One unirradiated slug from this PT was also photographed for comparison purposes.

A stainless steel pot used in the 200 Area for calcining developed a leak near the bottom. A disk containing the leak was cut out and sent to Radiometallurgy for examination to determine if a new section could be welded in to repair the pot. All tests to date show that this could be done successfully. A spectrochemical analysis showed the sample to be 347 stainless steel. Tensile test results showed the mechanical properties to be those of 347 stainless steel in the annealed condition. Metallurgical examination of the material revealed a normal stainless steel structure. Tests for sigma phase were negative.

Radiometallurgy Facilities

The cut off box began operation on October 8, 1954, and approximately 30 samples cut for further examination. Optical and etching problems within the metallographic cell caused the cell to be opened for repair. Only a limited number of samples could, therefore, be mechanically polished and no metallographic work could be accomplished. The electropolisher was removed from the cell and the cathodic etching equipment prepared for installation. About 1 hour is required to cathodically etch one sample. Arrangements for making rare gas analyses on irradiated materials were started by obtaining a vacuum furnace system from the Fuel Technology Unit. The canning and de-canning of samples of radioactive materials in conjunction with examination problems was improved. Length and diameter measurements of irradiated fuel elements were routinely obtained and

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the molding equipment was successful in obtaining accurate replicas of the 4-inch cored Ike slugs. Design and drafting was completed for a photographic quality lead glass cell plug which is proposed to improve the observation and photography of irradiated materials.

Separations Plant Corrosion Studies

In addition to the three precipitators, the D-1 and E-1 from B plant and the D-1 from T plant, which were examined last month (see HW-33200-R), two catch tanks, the D-3 and E-3 vessels in B plant, were examined this month. The corrosive attack on these catch tanks appears to be of the same type as was found on the precipitators, i.e., preferential attack of the welds with respect to the wrought material. For instance, the welds in the D-3 catch tank are corroded generally to a depth of approximately one-sixteenth of an inch with respect to the plate and some of the weld crators are corroded to a depth of one-fourth inch with respect to the plate. It is believed that the D-3 vessel from B plant could be judiciously placed in service with only minor repair to the weld seams and re-welding of the weld craters. The E-3 catch tank on the other hand has had only light corrosive attack of the welds, leaving them flush with the plate material. Only one crater was found in this vessel which had been attacked preferentially and it was corroded to a depth of about one-eighth of an inch with respect to the plate material. Thus the E-3 vessel could be placed in service with confidence that it would render several years of useful service before failure.

The failure of two submerged pumps in the WR 001 waste storage tank with service lives of five and six days respectively caused much concern and precipitated an immediate investigation. The material of construction of the pumps was mild steel throughout. Samples of the waste solution were taken from the bottom and the top of the tank and were found to have a pH of 2.2 and ~6 respectively. Visual examination of the pumps and an agitator during removal revealed gross dissolution of the mild steel. The pump torque tube and the agitator paddles had holes dissolved completely through them. This corrosive attack has been attributed to the presence of nitric acid in the normally basic waste solution. Steps have been taken to prevent the reoccurrence of this situation and no further investigation is considered necessary at this time.

Six type 304L stainless steel bayonet type heat exchangers, operating at 85 psig steam pressure, were exposed to boiling synthetic Purex 1WW waste concentrate (Purex Flowsheet #2) for 10 days. Qualitative and semi-quantitative examination following exposure revealed uniform corrosive attack over the entire surface of the bayonets. The vapor phase attack appeared to be of the same order of magnitude as in the liquid phase. Weight loss measurements indicate a uniform average corrosion rate of 0.0023 ipm. However, recent modifications to the Purex flowsheet, wherein both the acid concentration and salt content of the waste solutions were altered, have rendered these data invalid except for calibration and evaluation of the mock-up corrosion test unit which met design expectations and should be a valuable tool in performing heat transfer corrosion experiments which approximate plant operating conditions.

Applied Research Sub-Section

Welding Studies

During repair of faulty welded reinforcing the Purex waste concentrator overflow sections required plugging of many holes in the wall where faulty welds had been removed. The procedures followed by construction forces and the design of the plugs used to fill the holes were such that the penetration of the root pass was uncertain and uninspectable due to the inaccessability of the backside, and the completed plugs were cracked due to overmelting the plug which caused severe restrained shrinkage through the hot-short temperature range of austenitic stainless steels. A plug utilizing the general geometry of the G. E. type pipe joint was conceived and tested in the welding laboratory and put to use in repairing the concentrators. This plug design allows the penetration of the root pass to be inspected from the outside of the vessel at the completion of the pass and increases the amount of metal at the top of the plug to prevent the overmelting mentioned above. Apparently the plug design has proved successful and has resulted in good penetration and sound welds.

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Applied Research Sub-Section

PHYSICS

Lattice Physics

Some additional buckling measurements have been made with the large hollow slugs (I.D. = 1.11"; O.D. = 1.66"). These were done in the 10-3/8" lattice and the values are 73.4 and 29.7 x $10^{-6}cm^{-2}$ for the dry and wet cases respectively. The 1.36" diameter slug was also measured in this lattice giving 61.5 and 26.0 x $10^{-6}cm^{-2}$ for the dry and wet cases. The latter measurement was made in the core of a large exponential pile; its accuracy is therefore limited to about I 6 x 10^{-6} cm^{-2}.

The detailed measurements of flux distribution in a lattice cell being made to explore the degree of asymmetry in this distribution, are continuing. Data has been obtained for the dry cell, it is now being obtained for the case with cooling water. A very small BF_3 counter (I.D. = 1/16", length = 4"), is being developed to facilitate such measurements.

A recent measurement by M. V. Davis at the Test Pile, has shown that ca. 2.7 per cent of the fissions in U235 are caused by neutrons having energies above the cadmium cutoff energy. This result has led to a new formula for the multiplication factor of a lattice, namely:

$$k = m\varepsilon\, p\, f\, (p_{25}) \left(\frac{1}{1-\varepsilon\bar{\nu}_R p\,(1-p_{25})}\right)$$

in which the old formula is modified by the two factors in parenthesis. In this formula, p_{25} is the resonance escape probability of the U235 and $\bar{\nu}_R$ is the intermediate energy value of the number of neutrons per absorption in U235. Preliminary values for these two factors are 0.98 for the first and 1.015 for the second.

This new procedure has been used to calculate the bucklings of the 8-3/8", 5-3/16", and 4-3/16" lattices loaded with J slugs. The results, though improvements over earlier calculations, are yet off by 10 per cent in the case of the 8-3/8" lattice and 5 per cent in the other two.

Experimental Physics

The neutron flux drop across the C pile annulus has been measured in the Test Pile. The results are that the flux drops by 5 per cent in the empty annulus and by 30 per cent when it is filled with water. This measurement is difficult to make on account of the small dimensions involved. The same measurement will be repeated at elevated temperatures in the K pile. This information is needed in estimating temperature coefficients of reactivity.

Some Zn S buttons have been made and tested. These buttons are used as fast neutron detectors in conjunction with photomultiplier tubes. The existence of such detectors makes possible a measurement of the variation of ν with energy. This experiment will be done at the spectrometer facilities for U235.

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Applied Research Sub-Section

Physics Problems Connected with Plant Operation

The "allways safe" dimensions of a fissionable material depend, among other things, upon the value of γ, the number of neutrons per fission. It is well known that, in the case of plutonium, γ increases very sharply at high neutron energies. If, therefore, one considers a system in which the plutonium concentration is so high that most fissions occur at high neutron energies, than a higher value of γ obtains and the "allways safe" dimensions become smaller than for thermal, i.e. low energy, systems. The possibility that these conditions may occur at the "Recuplex" process has been examined. It has been shown that thermal "allways safe" dimensions apply up to an $H/_{Pu}$ ratio of about 50. Below this, smaller dimensions are needed. It turns out that the space concentrations in highly concentrated plutonium solutions of the various constituent atoms are not well known so that the limitation to an $H/_{Pu}$ ratio of 50 or more in all stages of the process can be made only tentatively at present. This matter is being further investigated by the "Recuplex" personnel.

INVENTIONS

All Applied Research Sub-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 October, 1954. 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.

F.W. Albaugh

Manager - Applied Research
ENGINEERING DEPARTMENT

FWA:md

G-1532, 1-D

GENERAL ELECTRIC COMPANY

[redacted]

HW-33585 DEL

RICHLAND, WASHINGTON . . . . . HANFORD ATOMIC PRODUCTS OPERATION

November 4, 1954

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MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

OCTOBER, 1954

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A PRIME CONTRACTOR FOR THE U.S. ATOMIC ENERGY COMMISSION

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VISITORS AND BUSINESS TRIPS

Name	Date	Address	Purpose
Glenn Murphy Richard Othman	10/12-14/54	Ames Laboratory Ames, Iowa	Discussion of fuel element technology
A. G. Ahsnust	10/25/54	Otis Elevator Co., San Francisco, Calif.	Elevator inspection in 329 Bldg.

Name	Date	Place Visited	Purpose
W. T. Kattner	10/1,2/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Consultations on uranium metallurgy
		Nat'l. Lead Co. of Ohio, Cincinnati, O.	Same as above
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above
		Bridgeport Brass Co., Adrian, Michigan	Same as above
		Battelle Memorial Inst., Columbus, O.	Same as above
		Ames Laboratory, Ames, Iowa	Same as above
J. W. Riches	10/1,2/54	(Same as W. T. Kattner above)	
R. L. Dillon	10/2,6/54	American Electro-chemical Society, Boston, Mass.	Attend meeting
F. B. Quinlan	10/2,12/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Discuss electronic equipment
		Carboloy Company, Detroit, Michigan	Drilling problems
D. C. Worlton	10/2,9/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Discuss electronic equipment
O. W. Rathbun	10/10,16/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Fabrication of uranium

VISITORS AND BUSINESS TRIPS

Name	Date	Place Visited	Purpose
G. E. McCullough	10/11,17/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Discussions of fuel element technology
		Mallinckrodt Chem. Wks., St. Louis, Mo.	Same as above
P. J. Pankaskie	10/16,20/54	KAPL, Schenectady,N.Y.	Metallurgical discussion
W. P. Wallace	10/16,22/54	du Pont Co., Augusta, Ga.	Discuss zirconium can and tube fabrication
		Superior Tube Co., Norristown, Pa.	Same as above
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above
E. A. Evans	10/16,23/54	du Pont Co., Augusta, Ga.	Coatings & corrosion problems
		Battelle Memorial Inst., Columbus, O.	Same as above
		Owens Corning Fibre-glass Co., Newark, O.	Same as above
J. W. Riches	10/20,29/54	Bridgeport Brass Co., Bridgeport, Conn. & Adrian, Mich.	Fabrication of uranium
H. L. Libby	10/29,31/54	Argonne Nat'l. Lab., Chicago, Ill.	Testing problems and attend Society for Non-destructive Testing

ORGANIZATION & PERSONNEL

Personnel totals as of October 31 were as follows:

	Exempt	Technical Graduates Permanent	Technical Graduates Rotational	Non-Exempt	Total
Fuel Assembly Unit	17	1	--	13	31
Fuel Element Development Unit	13	1	3	11	28
Fuel Evaluation Unit	12	--	--	13	25
Coatings & Corrosion Unit	10	1	--	7	18
Testing Methods Unit	7	--	--	3	10
Technical Shops Unit	4	--	--	24	28
Administration	1	--	--	4	5
Totals	64	3	3	75	145

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FUEL COMPONENT DEVELOPMENT

URANIUM QUALITY

Hydrogen in Uranium

The material, selected to be pile tested to study effects of hydrogen on the irradiation characteristics of uranium, has been ultrasonically tested at FMPC and the "cloverleaf" pattern marked on each rod. The straightened rods should be on-site by November 10. At HAPO the rods will be machined into eight-inch slugs and the "cloverleaf" position will be marked on each slug. The slugs will then be heat treated in the molten chloride salt used for production purposes at HAPO. Half of the heat treated slugs will then be outgassed, then all of the pieces will be lead dip canned by the standard F canning process. Testing these pieces under identical pile conditions should indicate the effect of hydrogen (in quantities associated with normal production) on the irradiation characteristics of the metal, and at the same time reveal the relationship between ruptures and the "cloverleaf" pattern.

As reported elsewhere, the recent high canning rejection rates, of slugs from rods heat treated in the new furnace at FMPC, have been substantially reduced by a six minute treatment in a molten chloride salt followed by a water quench prior to the pickle inspection and lead dip canning operation. HAPO personnel recently present at FMPC have found that the K_2CO_3 salt, although purchased on a calcined basis of 99 per cent K_2CO_3, contains 8 - 10 per cent moisture. It is also known that industrial molten salt baths are frequently diluted with water or steam to improve certain characteristics, so it can be assumed that some of the moisture in the charged K_2CO_3 will remain in the molten bath. This is a probable source of the hydrogen which is causing difficulty in the lead dip canning process at HAPO.

Heat Treatment

End dishing has now been observed on irradiated triple dip canned uranium. One eight-inch slug, irradiated to 741 MWD/T at 105-H was examined in Radiometallurgy after stripping, This slug was observed to be dished approximately 26 mils on the cap end, and 20 mils on the base end. This indicates that end dishing effects during irradiation are not limited to lead dip canned uranium.

Tentative conclusions from studies of the effect of various heat treatments on uranium are: decreased speeds of the beta to alpha transformation will reduce the columnar region present in heat treated rods, will yield a more uniform macrostructure and grain orientation, will reduce residual stresses by allowing more complete recovery, and should reduce the average slug orientation which is affected by beta heat treating and quenching. These data must be further expanded and substantiated not only for an adequate understanding of heat treatment effects on present slug cores but also on alloy materials proposed for future use.

URANIUM DEVELOPMENT

Fabrication of Uranium

Fifteen unalloyed uranium billets were extruded to hollow rod with a 3/8" I.D. at Adrian in September. The scheduled extrusion of alloy tubes was unsuccessful as a result of insufficient pressure at the press. In order to increase the effective unit pressure on the billet, the nominal seven-inch diameter billets are being machined to 6.2 inch diameter. With the resulting increase in unit pressure, it is expected that extrusion of the alloys will be possible with the present Adrian facilities.

The hollow rods extruded at Adrian in August have been received from FMPC and are being machined. The general appearance of the rod surfaces is good though there is some evidence of surface cracking. The holes in the slugs which have been machined appear relatively round and concentric. Some of the rods are still warped to an extent which causes slug rejection as a result of failure to clean up in machining. This indicates that improved rod handling is necessary during extrusion to reduce rod warpage.

The technique used in making cluster castings of fuel elements in zirconium cans has been successfully developed. A cluster casting of nineteen fuel elements resulted in apparent good bonding in all nineteen slugs. Modifications to the furnace arrangement have allowed better heat distribution in the mold increasing the bonding characteristics of the castings. Installation of thermocouples has allowed for improved melting controls during the casting operation. One thermocouple was placed in the crucible stopper rod to determine the melt temperature and one was placed in the can mold wall to determine the can temperatures.

Woodsplitter testing of some of the initial direct cast slugs resulted in failures occurring in a relatively few cycles. These slugs were capped by inert gas fusion welding unbonded zirconium wafers on the end. One piece failed by can rupture in an area in which the bond had apparently failed. Several additional pieces failed at the weld. The weld failures may possibly have been caused by deformation to the fuel core in the form of end bulging. This raises the stresses on the weld to a point which might conceivably cause failure. One possible cause of the bond failure and ultimate can wall failure could be the difference in coefficients of thermal expansion between uranium and zirconium. Uranium having a much higher coefficient of expansion as well as an asymmetrical temperature distribution would expand more than the zirconium jacket resulting in possible plastic deformation to the jacket. On cooling, the jacket would contract slower than the uranium and the bond would buckle at its weakest point causing the failure. Further extensive investigations into the cause of these failures is contemplated.

JACKETING COMPONENTS

Cold Closure

The cold pressure-weld canning of elements for PT 313-43-MT was completed this month; a total of 192 four-inch unbonded and 192 four-inch mechanically bonded elements were made; the machining of the can wall to size has been completed

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and the can wall thickness was checked out by non-destructive test methods. The autoclaving of these slugs as well as the lead-dip canned controls will begin in a few days. Pile charging is scheduled for November 15.

Aluminum Alloys

A shipment of 636 cans of 63S composition was received from ALCOA this month. Visual inspection as well as various other tests were underway, following which some 350 cans will be used for canning by the F process. After canning, random samples will be sent to 100-D flow laboratory for corrosion studies. This work is part of our over-all program concerned with the selection of better corrosion resistant alloy than our present 2S can stock.

Zirconium Tubes

A full length H type annulus zirconium tube was installed in the H loop to facilitate heat transfer studies as well as providing initial pile performance data of zirconium tubes.

FUEL ASSEMBLY DEVELOPMENT

High Reactivity Slugs for Low Goal Exposure

It has been estimated that approximately 190 inhours of reactivity per pile loading of low goal exposure material can be gained by fabricating lead dip slugs with larger diameter cores and reduced jacket thicknesses without significant failure risk. The "F" process specifications are being revised accordingly. This type of slug could be put into production in about 3 - 4 months depending on time required to procure the necessary jacketing components.

Hot Press Canning of Aluminum-Uranium Slug Cores

Shakedown of the hot press canning facilities was continued by the Metal Preparation Section using dummy slug cores for trial canning. It was necessary to order die housings made from Inconel-X to replace the Potomac steel housings originally supplied by the Project Section. In addition, it appears necessary

to use solid die inserts to avoid extrusion of the soft uranium-aluminum slug cores into the can wall at the points of flash when using split dies - which effectively reduces the residual can wall at these locations. Formal specifications are being prepared for the hot press canning of "J" and "C" alloy cores that specify the use of solid dies, the caustic-Diversey component preparation technique as an alternate to abrasive preparation, and the optional use of fusion welding to test the quality of the diffusion-welded closures. Manufacturing plans to hot press can about 5000 "C" alloy slug cores as part of their present commitments starting in November.

Fillerwelding

Chemical cleaning of the 2S aluminum Fillerwire immediately prior to use has improved the quality of Fillerwelded closures on unbonded slugs, particularly by leading to cleaner finished welds. The reduction of surface oxide and other foreign materials on the weld surfaces has in turn improved the reliability of bubble test. Fillerwelding is being instituted at this time as the production welding method for "C" process slugs.

Preparation of Zirconium - Jacketed Slugs

Efforts were continued to provide a limited number of zirconium-jacketed slugs for corrosion testing in high temperature water. Successful jacketing has been difficult to attain, principally due to can quality, the cans having many surface flaws and imperfections as well as wide dimensional variations, and the nature of the material itself.

Hot-Press Canning of Uranium

One hundred seven hot-press canned, nickel plated, externally cooled only, cored uranium fuel elements were charged in C pile on September 29. The lowest exposure tube - 600 MWD/T - will be discharged shortly after the first of the year.

Approximately one hundred eighty hot-pressed, nickel plated internally and externally cooled, fuel elements are being processed for pile charging under PT 105-587-A. This number falls short of the 224 required to make up the charge. It is presently proposed to charge the exposure tubes and, upon canning of additional material to be received in December, to charge the rupture tubes.

A group of six hot-pressed, nickel plated, diffusion bonded fuel elements canned at KAPL were received for evaluation. In addition to minor differences in the pressing operation, KAPL hot-pressed fuel elements differ from HAPO hot-pressed fuel elements in two ways: the pressure applied during the bonding operation - 24 tsi vs. 12 tsi at HAPO, and the degree of uranium etching prior to plating - a very smooth surface vs. a "rough" surface at HAPO. Of five pieces Sonobond tested, two were indicated to be unbonded. Subsequent mechanical stripping verified these results. The sixth piece was also mechanically stripped and found to be unbonded near the ends.

Hot-Press Canning of Thorium

Hot-press canning of unplated thorium has continued to be plagued by blisters and unbonded areas. Analysis of the gases contained in one blister showed three main constituents - 44.2% CH_4, 24.8% C_2H_6, and 28.1% N_2. Samples are being prepared and analyzed which will establish whether the source of the volatile materials is in the as-received core or in the surface preparation operations.

Fuel Element Pilot Plant

The revised project proposal for the Fuel Element Pilot Plant (CA-546) was approved in the amount of $2,000,000. Beneficial occupancy date for the pilot plant is February 1, 1955. The Phase II (interior construction) portions of the contract is expected to be completed by January 1, 1955, approximately 35 days late. Design, fabrication, and procurement of semi-works equipment for producing 40 tons of fuel elements per month is progressing. The semi-works line for this amount of production is expected to be in operation by May 1, 1955.

FUEL EVALUATION

Slug Failures

Twenty-two split type failures occurred at H pile in a localized area during the month. The cause of these failures has not been attributed to a particular type of metal or canning technique since three types of metal and canning techniques were involved. Further examination of some of the ruptures and incipient ruptures will be performed using the profilometer, breaker and ultrasonic equipment in the B Facility.

Slug Distortion

A comparison of the degree of warp experienced by the irradiation of some lead-dip and triple-dip slugs was made. This material was exposed to 630 MWD/T in F pile and is the most comparable available to date. The lead-dip material was more severely warped (maximum of 80 mils) than the triple-dip material (maximum of less than 25 mils). However, the surface contour of the lead-dip slugs was smooth whereas the contour of the triple-dip was quite wavy showing in one instance bumps on opposite sides of the piece of sufficient size to increase the diameter to 1.545 inches (1.44 inches when charged).

Thermal Cycling Tests

In woodsplitter thermal cycling tests, the times required to attain equilibrium temperature in the geometric center of a four and an eight-inch standard diameter thermocouple slug were measured during a standard two minute (one minute heating, one minute cooling) time cycle. In an eight-inch slug a steady high temperature of 675 C was achieved in 25 seconds of heating and cooling to 20 C required 30 seconds. The power was 108 KW and the water flow and temperature was 30 gpm and 18 C, respectively. Times for four-inch slugs were about the same.

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Aimed at increasing the severity of woodsplitter tests and confirming slug core temperatures previously measured, explorations continued on heating slugs into the beta and gamma phase. A core temperature of approximately 840 C was maintained in one four-inch slug for a ten minute period. Examination of a macro-etched surface of a sectioned sample shows three different grain structure patterns, an outer fine-grain (alpha) layer, a second layer of columnar grains (beta), and a central core of large random grains presumably heated into the gamma phase. This inner core is nearly one-half inch in diameter and extends three-quarters the length of the sample.

Four special cored slugs having a geometry proposed for use under high temperature-high pressure conditions were fabricated for destructive testing. Slug dimensions were 0.9" O.D., 0.5" I.D. and 7.91" long with 1/4" thick uranium end plugs welded in place. Two slugs were thermal-cycle tested in the woodsplitter, one for 50 cycles at 65 KW/ft. of uranium, and the second for a total of 192 cycles, with 160 cycles at 100 KW/ft. of uranium. Neither piece showed any gross sign of failure.

Two of the slugs were subjected to a pressure of 1750 psi at a temperature of 315 C to explore the possibility of collapse under expected operating conditions. Dimensional changes on the diameter were nil. The lengths shrank nine to eleven mils.

MTR Tests

The first test in the HAPO fuel element testing facility at the MTR was primarily for equipment shakedown and was completed on October 18. Three four-inch slugs, one cored and one solid both lead-dip canned, and one solid hot press canned were irradiated to 550 MWD/T at a specific power of 55 KW/foot.

HAPO type slugs are also being tested at MTR in a facility sponsored by Sylvania Electric Products. These tests are intended to show the accumulative effects of long-term irradiation. The slugs are intermittently discharged for examination, including length, diameter, and warp measurements. Currently, 12 four-inch natural uranium slugs are being irradiated, six wrought metal and six powder compacts, all nickel-plated hot press canned at Sylvania. Measurements after an exposure to 420 MWD/T at about 20 KW/foot specific power generally indicate both types of slugs shrink in length and grow in diameter, and the rate of dimensional change is more rapid for the wrought uranium.

Lead Dip Slug Performance

An estimated 50 tubes of standard production lead dip canned slugs (B lots) has reached exposure of 600 - 650 MWD/T in H pile. Performance has been satisfactory to date.

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TESTING METHODS

MIZ-1 - Al-Si Penetration Test

Metal Preparation Section personnel continue to report good results using the first MIZ-1 prototype to check slugs for Al-Si penetration. A slight change made this month in reject trip point resulted in a decrease in the number of slugs rejected which had more than 20 mils of residual can wall. Shortly after the runs reported, the old prototype equipment broke down and the extensive use to which it has been subjected make necessary extensive repairs to the mechanical components as well as to the probe coil which was destroyed. Work was, therefore, accelerated on the second model which will completely replace all parts of the first, and which from laboratory indications should be much more satisfactory from the standpoint of drift. It is expected that this new equipment will be moved into the 313 Building the first week in November at which time the first prototype will be returned to the laboratory for modification along the lines indicated by the development of the second.

Sonobond - Bond Test Equipment

"Bugs" continued to appear in the electronic equipment of the Sonobond during the month necessitating frequent returns to the laboratory for checking and repair. During its periods of operation it appeared to get good results except for the extraneous signals produced by its close proximity to the welders. The 20 megacycle signal amplifier and pulser were re-built to eliminate the problems posed by the narrow band-width on the previous unit, and this was apparently successful. "Shake down" operation on the equipment will continue, and meanwhile a new Sonobond instrument is being designed, and will be built in the shop.

Installation of Sonotest at F.M.P.C.

The Sonotest and the associated mechanical equipment for checking heat treated slugs for transformation was installed at Fernald during October. Some early difficulties in the operation have apparently been resolved by telephone, and it is now believed the equipment is in fully operable condition.

Sonic Vibrations

Re-examination of the resonant frequencies of sonic vibration with respect to torsional mode indicate that this mode may be particularly sensitive to the presence of 200 type orientation along the rod axis. There are, however, some ambiguities in the data which must be resolved before a definite conclusion can be drawn. It appears to be particularly difficult to compare sonic data with X-ray diffraction data because of the large differences in the size of the sample examined by the two methods. Consequently, correlations with dilatometer data and with tensile test specimens will be sought.

COATINGS AND CORROSION

High Temperature Corrosion of Aluminum

Some new types of aluminum alloys have been tested for corrosion in the range of 300 - 350 C. These alloys containing 2 to 5% copper were chosen on the theoretical basis that the presence of a large number of copper cathodes on the surface will prevent the adsorption of hydrogen and subsequent rapid deterioration of the alloy. Two alloys, 24S and 75S, after exposure at 350 C showed a slight weight gain but no disintegration as was noticed for all the other aluminum alloys tested. The 5% copper alloy, 24S, after 64 hours' exposure at 350 C lost approximately 0.00075-inch of aluminum. This indicates that such alloys may be used as jacketing material for fuel elements which will be exposed at temperatures of 300 C or higher. Work has been started to test similar alloys which may be even more promising.

Accelerated Corrosion Tests on Hot-Pressed Slugs

Some hot-pressed fuel elements were etched in caustic to determine whether accelerated corrosion would occur in some spots. It was found that the diffusion weld was attacked at a much faster rate. Further tests simulating more closely the pile conditions will be made to determine the importance of these observations.

Recovery of Chemical Solution from Plating Process

In the plating process, the uranium is etched electrolytically to form a uniformly rough surface as a base for plating. The etch solution soon becomes saturated with uranium salts and must be discarded or recovered. If it is discarded, the cost of the process increases considerably. A method of recovering the uranium and thus renewing the etch solution has been developed. This process makes the nickel plating process much more attractive from an economic standpoint.

Evaluation of Secondary Corrosion Barrier

A method for evaluating the effectiveness of the nickel plate as a secondary corrosion barrier was tried. The uranium slugs were plated and hot-press canned using a one-mil aluminum foil under the cap and placing an anodized plug in the cap. After canning, the plug was removed, exposing the thin aluminum foil. These were exposed in the autoclave to determine the time of exposure until failure occurred. Very preliminary results showed that the nickel layers were more effective than the iron or iron-copper electroplates. As was expected, the depth of etch was an important factor. The deeply-etched uranium pieces had a more porous, less uniform plate and did not last as long as the electropolished pieces. The tests are continuing.

Undercutting Tests

Some tests were conducted to determine the importance of the observations by Battelle Memorial Institute that uranium hydride is deposited under the electroplate and is responsible for the undercutting.

Undercutting tests were made of regular hot-pressed production pieces and of pieces specially treated to remove or prevent formation of uranium hydride. In all tests, several holes were drilled through the jacket into the uranium and the pieces were exposed in an autoclave at 170 C until swelling occurred. There seemed to be evidence that the presence of hydride or hydrogen does tend to promote undercutting. The most important observation, however, is that all pieces, including the regular production hot-pressed slugs, have good undercutting resistance; it was much better than was noticed for pieces tested previously and, in fact, is comparable to that of the Al-Si dip slugs. This improved undercutting resistance reflects the improvements in the hot-pressing procedure over the period of the last few months.

Pile Exposure of Anodic Films

One tube of anodized pieces was discharged from Production Test 29M after 97 days' exposure at an average outlet water temperature of 82 C. The pieces which had been anodized in an oxalic acid solution and sealed at 170 C were still protected by the anodic film. These may be compared with the unsealed anodized films tested in a previous production test; after about one week, the anodic film had disappeared from the unsealed pieces.

INVENTIONS

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. 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.

GE McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

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MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

OO Akerland of Panellit, Inc., Skokie, Ill., visited Hanford September 30th through October 30th to perform final checking on the temperature monitor system and investigate pressure monitor corrosion problems.

NA Rasmussen of Fryer Knoles, D. Morris of Jervis B. Webb Company, EJ Moe of Thurlow-Moe and Company, and LP Sharts of The LH Butcher Company, all of Seattle, Washington, and George Austin of Link-Belt Company, Spokane, Washington, visited Richland October 5th to 7th for discussion of underwater material handling equipment.

CS Slenning of Minneapolis-Honeywell Regulator Company, Philadelphia, Pa., visited Richland October 13th to inspect Brown instrument transducer.

RL Tower of Tower Equipment Company, Mercer Island, Washington, visited Hanford October 14th through 30th to investigate trouble encountered on the temperature monitor.

RW Cordell of Panellit, Inc., Skokie, Ill., visited Hanford October 25th through October 30 to supervise repair on 105-KW temperature monitor equipment.

JV Diller of Hammel-Dahl Company, Providence, R.I., visited Richland October 26th to inspect valves for Project CA-513.

R. Brooks of the General Electric Company, Schenectady, New York, visited Richland October 28th to 29th to discuss reactor stability.

NF Hildreth visited the Service Metal Fabricators Company, Los Angeles, California, September 17th through October 4th to inspect final assembly of the in-line alpha monitor.

GA Newell visited the Precision Machine Company, Tacoma, Washington, October 4th through 7th to discuss charging machine magazine fabrication problems.

HJ Bellarts visited Huntington Rubber Company, Portland, Oregon, October 11th to 12th for emergency purchase of 100-KW pigtails.

CO Clemetson visited Bumstead-Woolford, Seattle, Washington, October 14th through 16th for engineering consultation and approval of Project CA-512-R design and shop drawings.

TF Robinson visited the Ilco Tube Bending Works, Los Angeles, California, October 15th to 29th to discuss 100-K connector fabrication; the Ducommun Supply Company, Los Angeles, California, October 18th, to investigate supply of raw materials for connectors; the Metal Control Laboratory, Los Angeles, California, October 22, to discuss laboratory work on connectors; and the Hollywood Heat Treat Company, Los Angeles, California, to discuss heat treatment of connectors.

WM Harty and LR Michels visited the Lummus Corporation, New York City, N.Y., October 26th through October 30th to assist in Project CG-598 procurement negotiations.

EB LaVelle visited the General Electric Company, ANP Department, Cincinatti, Ohio, October 28th to 29th to attend an AEC welding committee meeting and tour of the ANP Plant.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	September 3			October 31		
	Exempt	Non Exempt	Total	Exempt	Non Exempt	Total
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	67	13	80	68	13	81
Design Planning Unit	18	11	29	18	11	29
Design Engineering Sub-Section	82	11	93	84	11	95
Design Drafting Unit	8	86	94	8	86	94
Total Section Personnel	176	122	298	179	122	301
Technical Graduates (Rotational)	-	6	6	-	5	5
TOTAL	176	128	304	179	127	306

Accessions - 7
Separations - 5

GENERAL

Design Section engineering and drafting effort for October was distributed approximately as follows:

	Engineering Man Months Expended	Drafting Man Months Expended	Overall % of Total
1952 Expansion Program	33.3	12.9	18
Reactor Plant Modification for Increased Production	24.9	22.8	18
4-X Program	13.2	2.8	6
Design Development	57.8	7.4	27
1706-KER Recirculation Facilities	12.4	12.6	10
Other	25.5	30.9	21
	167.1*	89.4*	100

*Equivalent man months expended includes 2.8 months of engineering and 0.4 months of drafting overtime. Approximately 6.7% of the Section personnel worked a six-day week.

The drafting production for the month was 480 new drawings, 28 charts and graphs, and 210 revisions. Based on the weighting of 10 charts and graphs or 10 revisions equal

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to one new drawing, the man-days per drawing is 3.6.

DESIGN DEVELOPMENT

Statistics:

The total number of engineering and drafting man months expended on research and development during October was distributed as follows:

	Engineering		Drafting	
	Man Mo.	% of Total	Man Mo.	% of Total
Metallurgical Design Development	3.4	5.9	0.1	1.4
Reactor Plant Design Development	27.9	48.3	2.6	35.1
Separations Plant Design Development	24.0	41.5	3.0	40.5
Chemical Processing and Reduction Design Development	0.8	1.4	-	-
234-5 Design Development	1.7	2.9	1.7	23.0
	57.8	100.0	7.4	100.0

Metallurgical Design Development

Work was initiated on process equipment layouts, plant cost and estimated operating cost for production application of hot press and cold closure canning. A process layout is being prepared for a semi-works line for study of the process and equipment to be used in the hollow fuel element hot press and solid fuel element cold closure fabricating techniques.

Reactor Plant Design Development

Work was started on an independent analysis of the economic feasibility of continuously charging and discharging fuel in the existing reactors. It appears that these facilities provide a substantial potential for increased reactor production as well as other benefits.

Reactor design development was initiated to study the sequence of events following the bursting of a process tube in a high pressure reactor and the question of the feasibility of continued operation of a high temperature, recirculating reactor following a slug rupture. This study will also investigate the use of steel jackets for fuel elements operated at high temperature.

A document is in preparation which summarizes data available concerning the use of alternate material for stainless steel in high-temperature high-pressure reactor designs. Information available at present justifies serious consideration of an all carbon steel system in lieu of stainless steel.

The reactor back-up water system study was completed and a report, to include preliminary

design scope, cost estimates, and an analysis of the conditions considered, will be issued.

Other development studies included: ultrasonic cleaning of fuel element dummies; mechanized handling, sorting and conveying of fuel elements and dummies in the reactor discharge area and storage basin; improved equipment for rear-face removal of process tubes; and differential pressure transducers which might be applied to a flow monitoring installation.

Separations Plant Design Development

The BPX Plant Study was completed and a feasibility report was issued to management for consideration. This plan would couple the B Plant with the TBP Plant; the conclusions for this study are that the plant would be feasible but costs and timing would be such that substitution of a BPX Plant for the Bismuth Phosphate Plants of the 4X Program would be uneconomical. A Bitrex Plant study was started to analyze the feasibility of coupling the B and T Plants to Redox.

Work was continued on the preliminary scope for a central ozonization facility to care for all HAPO uranium output. The capacity basis and process flow diagram for this system were reviewed. Three alternates for in-canyon ozone installation at Redox were also studied. Sufficient scope information was developed for these alternates so that cost estimates can be prepared to provide the basis for comparing these proposals with that for the central facility.

Scope data on two alternates for increasing the Redox Plant canyon ventilation are being reviewed. One method provides continuous operation while the other would provide intermittent operation during the period when the cells would be open. The assurance of reliability of the former awaits satisfactory results from the pending mock-up test.

Preliminary design was started on prototype equipment for mechanical de-canning of fuel elements. Justification for the process lies in possible economic considerations for de-canning aluminum jackets and for potential use of a non-aluminum jacket for a more severe service condition under longer exposures. The two methods consist of shearing both ends and wall or shearing the ends followed by wall removal by a turning operation.

Fabrication of the in-line alpha monitor by a vendor is continuing and shipment is expected the first part of next month. The pneumatic and electrical control equipment is being fabricated locally. Delivery of the automatic scaling and data printing instrument is being expedited.

Chemical Processing and Reduction Design Development

An information report on development work performed to test various means of driving the Task III conveyor sweeparms was issued during the month. Fabrication of parts for the Task II prototype vertical furnace in the 234-5 Building was started and nearly completed during the month. A recommendation report, "Improvement of the Hydrogen

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Fluoride Gas Delivery System in the 234-5 Building", was completed, approved, and issued.

234-5 Design Development

Three Task V study stage drawings were completed during the month on development of machining using vertical spindle lathes. Development work on the RM Line conveyor system is concentrated on revising the folding arm conveyor so that it may be more simply and reliably operated.

Engineering Standards and Materials Development

Cost to date for development of engineering standards for the current fiscal year is $29,843.

The following standards, design instructions, and revised standards were completed and issued during the month.

D-2-3c	Single Crossarm Assembly - Vertical Loading Power
D-2-3d	Double Crossarm Assembly - Vertical Loading Power
D-2-3e	Double Crossarm Assembly - Dead End Loading Power
D-3-3	Distribution Grounding Assembly - Non-Operated Equipment and Telephone Lines
D-3-3a	Distribution Grounding Assembly - Personnel - Operated Equipment
J-2-1	Instrument Panel
J-2-2	Instrument Panel Finish
DI-C-4-3	"Design Instructions to Design Engineers for Use of Standard C-4-3"
DI-D-3-3 & DI-D-3-3a	"Design Instructions for Distribution Line Grounding Assembly Standards"
D-6-100	One Phase Primary and Street Lighting Tangent, Rev.1
D-6-102	One Phase Primary Tangent Street Lighting 90° Turn, Rev.1
D-6-162	3-Phase Primary Tangent - Street Lighting 90° Turn, Rev.1
D-10-1	1 Phase Primary Tangent - Single Crossarm, Rev.1
D-10-2	1 Phase Primary Tangent, Double Crossarm, Rev.1
DG-100-M	"Design Guide for Process and Service Piping", Rev.4
DG-101-M	"Design Guide for Valves and Valve Equivalents", Rev.1

Work on standards and studies during the month is as follows:

a. Work is under way on a new standard, E-5-12a, "Concrete Cradle Bidding for Pipes".

b. Revisions to existing standards on name plates, steel ladder cage, radiation barricade, stairway construction and standard pipe encasements are now 50%

complete.

c. Work on HWS-5766-S, "Standard Specification for Radiographic Spot Examination of Welded Joints", was advanced 10% during the month to 90% complete.

d. Preparation of standard design criteria is as follows: electrical sections, 90% complete; interior electrical power and lighting systems, 85% complete; auxiliary signalling communications system, 75% complete.

e. Other items studied were cathodic protection, concrete anchors for guying posts, and use of plastic dotted-line fllor markers.

DESIGN PROJECTS

Statistics:

Design engineering and drafting effort of the Section on projects for the month of October was expended in the following categories:

	Engineering		Drafting	
	Man Mo.	% of Total	Man Mo.	% of Total
1952 Expansion Program	33.3	30.5	12.9	15.7
4-X Program	13.2	12.1	2.8	3.4
Reactor Plant Modification for Increased Production	24.9	22.7	22.8	27.8
1706-KER Recirculation Facilities	12.4	11.3	12.6	15.4
Other Design Projects	7.4	6.8	5.0	6.1
Miscellaneous Design Orders	18.1	16.6	25.9	31.6
	109.3	100.0	82.0	100.0

CA-512 - 100-K Area Facilities

Design activities on 100-K Reactor Facilities consisted mainly of the following items in support of construction: bid review, drawing revisions, review of vendor drawings, the preparation of construction as-builts, and design liaison with the field. Major difficulties were encountered with metallurgically unacceptable aluminum front-face connectors. Temporary neoprene and new aluminum connectors of the poison column confirguration were ordered.

A recommendation was made, based on results of a study, that sulphuric acid facilities be added at the 100-KW and 100-KE water plants to provide pH control before water treatment. This control will provide process water which may permit higher outlet water temperatures and longer tube life due to decreased corrosion rate.

Design of the 1706-KER Recirculation Facilities was advanced 22% during the month

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to 62% complete. Of the 128 required drawings, 20 are in the check print stage, 22 have been issued for comment and 39 issued for approval, bringing the total number of drawings issued for approval to 47.

Design was expedited during the month to enable Kaiser Engineers to construct the building structure. The structural drawings were completed. Basic design work was adjusted to allow for the following: material of one loop was changed to carbon steel; changing and sanitary facilities were included between the cell area and the existing 1706-KE Building; the method of hydrogen introduction was changed; the clean-up system for the loops was enlarged; and the electrical space requirements were increased. The construction cost estimate was reviewed and, due to substantial cost increases, work has been delayed pending AEC agreement to the revised total estimated cost.

CA-513 - Purex Separations Facility

Design of the revisions to the condenser design for the Purex Tank Farm is 98% complete. The design of the new proportional sampling equipment was submitted for comment. Work was started on the detailed design of the ammonia scrubber and jumpers for Purex. A total of seven drawings will be required and the tank drawing is in the checking stage. The emergency power load requirements in the Purex facility are being reviewed to determine whether or not this facility together with the 221-B Plant will cause an emergency power shortage in the 200-E Area.

CA-514 - 300 Area Expansion

Design of the 300 Area Expansion Program was advanced 2% during the month to 98% complete. Work concerned with the conversion of the 3706 and 3703 Buildings to first aid and office occupancy is 99% complete, an advance of 9% during the month. Design of the electronic portion of the ultrasonic bond test equipment is 50% complete. Of 16 required drawings, six have been issued for comment and two are in the check print stage.

CA-535 - Redox Capacity Increase, Phase II

Detail design of the Redox Capacity Increase, Phase II, is 100% complete, an advance of 1% during the month.

CG-558 - Reactor Plant Modification for Increased Production

Total design on Reactor Plant Modification for Increased Production is 42.6% complete, an increase of 4.1% during the month. Detail and design scope were advanced 4.3% and 4%, respectively, during the month to 37.4% and 91% complete.

All design work and preparation of requisitions necessary for equipment installation during the first shutdown for replacement of horizontal rods and thimbles and for replacement pressure gages has been completed.

Work is nearing completion on the preparation of Project Proposal, Revision 4, incorporating the revised scope of work in accordance with Modifications 5 and 6 of Directive HW-309 such as the deletion of water plant work at F and H Reactors, inclusion of replacement Panellit gages, deferment of installation of "back-up"

instrumentation, and other changes. Procurement of new nozzles is being delayed pending investigation of the practicability of designing a nozzle through which it would be possible to withdraw process tubes It was decided to fabricate the replacement downcomers at 105-B and 105-D out of bare carbon steel.

Design of facilities for the 100-B, D, and DR Areas is complete for "comment" issue while design of facilities in the 100-F and H Areas has not been started. The work involves modifications to the 181, 183, 190, 105, and 151 Buildings as well as raw water lines between the 181 and 183 Buildings, and the effluent systems.

CG-562 - Waste Metal Recovery Plant Modifications

Design was advanced 10% during the month to 100% complete. Three drawings were completed and approved.

CG-574 - Hanford 3-X Program - Irradiation

Detail design is approximately 52% complete, an advance of 31% during the month. Of twelve mechanical drawings required, one is approved and six have been issued for comment. Purchase specifications were prepared for material required for "J" fuel element casks.

CG-578 - Effluent Water Monitoring Improvements, 100-B, D, DR, F, and H Areas

Design was advanced 21% during the month to 58% complete. Of a total of 67 drawings, ten were approved, thirteen were issued for comment and seven were issued as check prints during the month. The purchase requisitions were written for the rotameter racks for all areas and for the rotameters for 105-B, D, and F Buildings.

CG 588 - Ammonia Scrubbers, Redox

Design is 100% complete, an advance of 10% during the month. Two drawings were completed making a total of 26 drawings approved. Field work on this project was interrupted until a firm decision could be made relating to the present need for these facilities, in the light of recent improved plant performance.

CG-596 - Central Mask Washing Station Building 2723-W - Separations

Authorization was received during the month for start of detail design of the Central Mask Washing Station in Building 2723-W.

CG-597 & CG-603 - Hanford 4-X Program - 200 and 300 Areas

Activity on the 4-X Program is continuing on a priority basis. Scope design for Phase I of the B and T Plants is 70% complete while detail design was started during the month and is 15% complete. The design criteria for the B Plant Reactivation are

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being submitted to the AEC for approval, incorporating minor changes as agreed with the AEC. The project proposal CG-603, which combines the work at the Bismuth Phosphate Plants into one project, was completed and the securing of approvals was initiated. A scope and criteria document was prepared for the modification of the T Plant to increase its capacity to 150 tons of uranium per month.

Of the three methods of handling the increased load of UNH, it appears at the present time that this problem might best be solved by the expansion of the UO_3 Plant through the addition of three continuous calciners. This proposal is based on anticipated successful results of tests being performed on a prototype continuous calciner being developed at Hanford. Investigation of the feasibility and costs of providing segregation of high and low exposure uranium in the UO_3 Plant and the contemplated Central Ozonization Facility has indicated that segregation is feasible with an additional capital expenditure of $250,000.

Scoping work done on the 300 Area phase of the 4-X Program included a comprehensive study of 313 Building utility services under production loads estimated for the 4-X Program. The production capacity of process equipment through successive steps was established and a document issued.

CG-598 - Purex Vacuum Fractionator

Negotiations are under way with a designer-fabricator for design of the Purex Vacuum Fractionator with provision for later extension of the purchase contract to include fabrication. Work on design drawings is inactive pending receipt of the vendor's design.

CG-599 - Hanford 4-X Program - 100 Area

A determination of a justification for additional slug buckets, cask car, and casks is being developed but still is not available. Stainless steel buckets have been requisitioned. Bids received to date indicate a saving of $9,500 per 600 buckets. This saving was obtained by a modification to the present bucket design. Scope and detail design each are 50% complete.

CG-600 - 100-C Alterations

Authority was received during the month for start of design on 100-C Alterations to allow increased continuous process water flows, to provide for charging and discharging poison columns during operation, and to provide toggle valves for use in calibrating existing Panellit gages.

D.O. 100549 - Redox Back Cycle (CG-187-D-II)

Design on the Redox Back-Cycle was advanced 20% during the month to 100% complete. Fourteen jumper drawings were completed during the month.

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D.O. 100748 - 230-KV Transmission Line

The project proposal, revision 1, was completed and forwarded to the Financial Department for review and action. The total estimated project cost is $1,500,000, an increase of $110,000 over the original estimated cost. The cost estimate was increased to incorporate the most recent cost estimate from the BPA for the work it will perform and to provide funds for construction site decontamination work.

D.O. 100754 - Modification of the 189-D Process Tube Mock-Up

Design is approximately 90% complete, an advance of 25% during the month.

D.O. 100757 - "As-Built" Area Maps

Drafting is continuing on the revision of Hanford maps to bring them up to date and is approximately 50% complete, an increase of 8% during the month. Seventy-one drawings were started during the month, making a total of 276 drawings started of 400 drawings required.

D.O. 100825 - Silica Gel Tail-End Treatment - Redox Phase II (CG-535)

Design was advanced 10% during the month to 95% complete. Of 53 required drawings, five drawings are out for comment and 23 drawings were approved during the month to make a total of 42 approved drawings.

D.O. 100889 - Project Proposal, Additional Records Storage Facilities - 712 Building

The project proposal was forwarded to the Financial Department early in the month for review and action. The total estimated project cost is $96,000. The proposal was submitted to the AEC at the end of the month.

D.O. 100890 Yakima River Pump Station and Feeder Line

Design and drafting was started on plans and specifications for the Yakima River Pump Station and Feeder Line to Wellsian Way Recharge Basin. The design is approximately 20% complete.

D.O. 100930 - Graphite Hot Shop and Storage Facility - 3730 Building

Detail design of the renovation and addition to Building 3730 as a hot shop is approximately 80% complete, an advance of 20% during the month.

D.O. 100946 - Foxboro Dewcel Moisture Monitoring System (CG-583)

Detail design of a gas moisture detection system for the 100 Areas was advanced 20% during the month to 50% complete. Five drawings have been approved and five drawings are at the comment stage.

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D.O. 100963 - Floor Loading Stress Survey, 325 Building

Checking the floor structure for proposed loadings in various rooms of the 325 Building is approximately 70% complete, an advance of 10% during the month.

D.O. 101015 - Dejacketing and Ultrasonic Equipment, 105-C Bldg. (CG-589)

Design of a slug stripper and ultrasonic grain size determinator was advanced to approximately 40% complete, an increase of 18% during the month. Of a total of 22 required drawings, 13 are in the check print stage.

D.O. 101035 - Installation of Car Pullers, 100-B, D, F, and H Areas

Design for the installation of car pullers was advanced 40% during the month to 90% complete.

D.O. 101036 - Moisture Monitoring System, 105-C Building

Detail design was started on a Foxboro dewcel moisture monitoring system to be installed at 105-C Building and is 20% complete.

D.O. 101039 - H-4 Oxidizer Redesign

Detail design was completed in accordance with the scope and three drawings are ready for approval. Due to the close clearance between the H-4 tank and neighboring tanks, the scope is being reviewed.

D.O. 101045 - Discharge Area Television Viewer, 105-B (CG-593)

Detail design for the 105-B closed circuit discharge area television viewer was advanced 12% during the month to 36% complete.

D.O. 101051 - Additional Helium Storage Facilities - Building 234-5

The scope was reviewed and requests were issued for project cost estimate, design cost estimate, and design force and completion schedules.

D.O. 101052 - Redox Stack Sampler - Project Proposal

The expanded scope for the Redox Stack Sampler was reviewed and requests were issued for project cost estimate and design force and completion schedules.

D.O. 101062 - HNO_3 Decontamination Facilities - 100 Areas - Project Proposal

The rough draft of the project proposal and the scope drawing were completed. The work is approximately 80% complete.

D.O. 101063 - Alum-Activated Silica Water Treatment Facility, Phase II - Project Proposal

Preliminary work was started on the preparation of a project proposal for Alum-Activated Silica Water Treatment Facility, Phase II. The Phase II is required in connection with the CG-558 maximum water flows.

D.O. 101067 - Remote Sampling Equipment - Hot Semi-Works

Design was started on the installation of remote sampling equipment in the Hot Semi-Works and is 80% complete.

D.O. 101069 - Thermal Test Reactor - Graphite

Detail design for the moderator for the thermal test reactor was advanced to essential completion. A total of 50 drawings are required.

D.O. 101100 and 101105 - Fuel Element Pilot Plant Equipment Design and Installation, (CA-546)

Detail design was started during the month on equipment design and installation for the Fuel Element Pilot Plant semi-works.

DESIGN SECTION WORK COMPLETED DURING OCTOBER

D.O. 100822	Shielding Screen for Central Viewers
D.O. 100838	Tip-Off Model Dwg. 105 Buildings
D.O. 100860	Structural Check on Floor - 325 Building
D.O. 100868	Water Cooler for Aquaria
D.O. 100924	H-4 Pot Shims, 202-S Building
D.O. 101033	Dissolver Temperature Jumper - 221-T Building
D.O. 101047	Jet Jumper D-7 to D-8, 202-S Building
D.O. 101053	Flow Sketch, 234-5 Building
D.O. 101056	Wall Nozzle #13 for Cell 23, 221-T Building
D.O. 101065	Addition to 200-W Fire Station, Building 2709-W
D.O. 101066	Storage for Mercuric Nitrate, 221-T Building
D.O. 101072	Redox Two Piece "A" Jet
D.O. 101080	4-8 Tank Jumper, 66 to 11, 221-T Building

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 noted 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	Subject
E. Hollister	Special Canning Sleeve

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P. W. Beaton
Manager, Design
ENGINEERING DEPARTMENT

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DESIGN SECTION WORK STATUS

ENGINEERING MAN MONTHS

PROCESS ENGINEERING SUB-SECTION

Description	Backlog Start of Mo.	Work Sched Dur. Mo.	Time Spent Dur. Mo.	% of Total Effort	Backlog End of Month	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Bal FY 55 And Later**	Total
1952 Exp. Program***	76.7		14.6	21.1	62.1	12	11	9	8	7	6	9.1	62.1
CG-558	19.6		3.9	5.6	15.7	4	3	3	2	2	2		16.0
CG-598	3.0		.2	0.3	2.8	.5	.5	.5	.5	.5	.5		3.0
4-X Program*	43.4		2.3	3.3	41.1	4	5	6	6	6	5	9.1	41.1
Reactor D&D*	217.3		22.8	32.9	194.5	21	23	23	23	24	25	55.5	194.5
Sep. D&D*	162.3		18.9	27.3	143.4	18	17	17	18	18	18	37.4	143.4
Met. D&D*	15.7		1.6	2.3	14.1	2	2	2	2	2	2	2.1	14.1
234-5 D&D	14.2		.3	0.4	13.9	1.5	1.5	1.5	1.5	1.5	1.5	4.9	13.9
Weapons D&D	9.0		.8	1.1	8.2	1	1	1	1	1	1	2.2	8.2
Other Proj. & Misc.	34.0		3.9	5.7	30.1	4	4	4	4	4	4	6.1	30.1
Anticipated Future Work								1	2	2	3	9.0	17.0
TOTALS	595.2	—	69.3	100.0	525.9	68.0	68.0	68.0	68.0	68.0	68.0	135.4	543.4

DESIGN ENGINEERING SUB-SECTION

1952 Exp. Prog.***	88.2	14.0	23.8	29.9	78.4	20	15	10	8	6	5	14.4	78.4
CG-558 & 600	182.9	32.0	18.6	23.3	196.3	19	19	19	19	19	19	82.3	196.3
CG-578 & 579	16.5		1.1	1.3	15.4	2	2	1	1	1	1	7.4	15.4
CG-598*	25.0		1.1	1.3	23.9	2	3	5	5	4	2	2.9	23.9
4-X Program	23.7	80.0	8.1	10.0	95.6	10	13	16	14	13	10	19.6	95.6
D&D Programs	99.9		8.5	10.6	91.4	9	9	9	9	9	10	36.4	91.4
Other Major Projects	143.9	37.0	13.3	16.7	167.6	14	14	15	15	15	15	79.6	167.6
Minor Projs.& Des.Orders	52.0	4.0	5.5	6.9	50.5	4	4	4	4	4	5	25.5	50.5
Anticipated Future Work							1	1	5	9	13	40.0	69
TOTALS	632.1	167.0	80.0	100.0	719.1	80.0	80.0	80.0	80.0	80.0	80.0	308.1	788.1

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects FY 55	Anticipated Future FY 55	Totals
Arch. & Civil	145	9	154
Mechanical	230	18	248
Electrical	120	20	140
Instrument	160	16	176
Standards	64	6	70
TOTALS	719	69	788

* Adjusted Backlog
** Continued Projects in FY 56
*** Includes 1706 KER

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MONTHLY NARRATIVE REPORT - OCTOBER, 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

During the month, the reduction of exempt personnel included four transfers within the Company, one R.O.F., one resignation, one departure for military service, and the death of M. O. Triem, Area Superintendent, as the result of arterial heart failur Following is a summary of personnel changes in Project Section during the month:

	September 30, 1954	October 31, 1954	Net Change
Employees on Payroll	411	403	-8
Tech. Grad. - Rotational	5	6	+1

The end-of-month status involved these changes:

	Project Section	Tech. Grad. - Rotational
Payroll Additions	2	
Payroll Removals	6	
Transfers into Section	0	2
Transfers from Section	4	1
Transfers within Section	0	

B. SCOPE OF ACTIVITIES

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

Project No.	Title	Completion Scheduled	Completion Actual
CG-496	Recuplex	86%	84%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	99.5
	Reactor and Building	100	99.6
	KE - Water Plant	100	94.4
	Reactor and Building	100	92
	General Facilities	100	94.2
CA-513	Purex Facilities, Part "A"	94	79
	Part "D"	100	99
CA-514	300 Area Expansion	68	72
CG-535	Redox Capacity Increase, Phase II	85	81
CA-546	Fuel Element Pilot Plant	54	55

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C. CRAFT LABOR

The labor dispute concerning craft affiliation which occurred between pipefitters assigned to 300 Area Expansion and pipefitters employed by a vendor was settled early in the month. Discussions have been held with local Building Trades representatives concerning work assignments as they are affected by the Davis-Bacon Act. The position of the Company appears to be satisfactory.

D. SAFETY AND SECURITY

For the second consecutive month, there were no security violations by Project Section personnel. Eight regular meetings for discussion of safety, security, and health topics were attended by about 290 personnel. Four Monday morning tool box and three mass safety-security meetings were conducted in the field for service contractor personnel. Safety and Special Hazards Orientations were given to 40 new and re-hired construction employees. Three cases of contamination, two of skin on hands and one of a shoe, occurred during the month. All were successfully decontaminated.

E. HIGHLIGHTS

Minor Projects Sub-Section

Work was done on 43 project items, four informal requests, and miscellaneous work orders representing total authorized funds of $40,766,093. The Sub-Section completed assigned work on CA-516, Gable-Butte Railroad; CG-573, Hanford 3X Program - 300 Area; ER A-766, Liquid Waste Disposal Facilities, Building 108-F; and ER A-3107, Hanford Works Laboratory Exceptions. Two project proposals were approved by the General Electric Company. Three authorizations were granted by A.E.C. The Sub-Section accepted initial assignment of work on one informal request and four engineering requests. Minor Construction Management Unit has received the remaining 40% of store stock material formerly controlled by Kaiser Engineers. The fence around the storage area has been completed, and landlord responsibility for the area is being transferred from A.E.C. to Engineering Department. Important projects now in progress include Recuplex Installation, Activate Task I - RMA Line, Expansion of 300 Area Production Facilities, Fuel Element Pilot Plant, Hot Semiworks Conversion, Hanford 3X Program, Reactor Plant Modification, and Hanford 4X Program.

Project Auxiliaries Sub-Section

By completion of 353 orders, Inspection reduced the total number of orders requiring inspection to 558, a decrease of 28%. This total included 104 new orders which require inspection. Samples evaluated under the Corrosion Testing Program remained about level at 260. Reproduction output was 313,844 square feet, a decrease of about 28%. Estimating completed 26 estimates, of which 10 were for project proposals. The overall workload of estimating increased. Field Surveys continued to obtain preliminary data for the Reactor Modification program, and to provide routine survey services.

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Reactor Projects Sub-Section

At 2101-M Building, fabrication of graphite for the Physical Constants Test Reactor was about 95% complete. Mock-up was started on October 28. For 105-KW, mid-November was considered the earliest ready-for-use date. Overall completion of the 76 Acceptance Tests was about 65% for 105-KW Reactor. For the KW Water Plant the major portions of Acceptance Tests were completed, although only two had been completed and approved. An unofficial inspection of the KW Water Plant buildings was made, and the list of several hundred incomplete items was discussed with the A.E.C. engineer. One half of the KE Water Plant was in operating condition, and controls are being completed for the other half. In 165-KE, the three boilers and two of the turbines have been given preliminary tests. Alterations to both Substations have been completed. All six 181-KE River Pumps are in operating condition. For 105-KW Reactor ten rows of tubes have been loaded to simulate a loaded pile for re-run of the Dynamic Flow Test. Correction of architectural and structural punch list items for 105-KW Building was about 50% complete. In 105-KE Building, the Storage Basin monorail was completed with minor exceptions. All steam lines have been tested and flushed. All 105-KE nozzles were installed, including 200 silicone-treated outlet nozzles. Acceptance testing began on the Solids Feed System and the pneumatic test of crossheaders, nozzles, and tubes. A.T.P. 1292, Gas Circulation System in 115-KE, has been completed without exception. The siding and roofing of Building 1706-K have been completed, and Wheeler bottoms have been placed for Filters #1 and #2.

Separations Projects Sub-Section

Design efforts during the month were concentrated on bid reviews, design changes, and the "as-built" program. Design progressed on the ammonia scrubber and on the related Vacuum Acid Fractionator (CG-598). Construction of 202-A Building was estimated at 76.8% complete. Welding in the Hot Pipe Trench was essentially completed, and punch list items are being cleared. Installation of pipe jumpers began in Cell "D", and 26 were completed. Fabrication of jumpers progressed to 724 welded, 590 framed and balanced, and 560 tested. Amercoat painting was completed through Cell "F", and painting was completed in the Decontamination Cell, Pool Cell, and Slug Storage Basin. The stainless steel liner was completed in Cell "L". Installation of ductwork throughout 202-A was 81% complete, and heating and ventilation systems were 78% complete. Installation of 291-A Stack liner was essentially completed, and wash-down facilities are being installed. Major equipment installations included five Gallery Tanks, three Organic Storage Tanks and one centrifuge, and pumps and agitators in the Galleries. Calibration of instruments in the Central Control Room progressed to about 50% complete. Tubing connections are being made at both Head End and Central Control Room. Gravity testing of tanks was completed in 203-A Storage Area and the 211-A Chemical Tank Farm. Mock-up work in 272-E Building consisted of repairs to concentrators and assembly of liquid-liquid centrifuges. The 284-E Power Plant Addition was completed, and the 283-E Filter Plant Addition progressed to the stage of clearing punch list items. At 241-A Tank Farm, concrete domes were finished on tanks #101, 102, and 105. Area backfilling was about 75% complete. A contract has been let for new work in the 241-A Tank Farm.

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F. MONTHLY REPORT OF INVENTIONS AND DISCOVERIES

All persons in the Project Section engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge 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 notebooks and records, if any, kept in the course of their work, have been examined for possible inventions and discoveries.

NONE

October 31, 1954

J. S. McMahon, Manager - Projects

[redacted]

[redacted]

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

IR-185 - Heating No. 1 and No. 2 Warehouses - White Bluffs

This informal request was approved by A.E.C. in the amount of $11,000. The scope of work includes installation of space heaters and necessary facilities in the warehouses. A work release was issued to Minor Construction on October 20, 1954. Material procurement has been started.

ER A-1216 - KAPL - 120 Basin Facility - 100-H Area

This work consists of constructing a concrete water basin in 100-H to be used during removal of equipment from a test hole in 105-H. Since the work can be accomplished through work orders, the informal request will not be processed.

ER A-1217 - 186-D Building Renovation

Preliminary design was about 20% complete. At a cost of $40,000, this project is to provide 8200 square feet of storage space in 186-D Building, and is to cover cost of relocating equipment and materials from existing storage locations. The project proposal is being prepared.

ER A-2756 - FY-1955 Water Tank Replacements - 100-200 Areas

The project proposal is being prepared to cover the cost of tank replacements in the 100-B and 200-W Areas. Scoping was about 10% complete. The work to be accomplished is similar to that now being performed on Project CA-532, FY-1954 Water Tank Replacements.

ER A-3111 - Vacuum Furnace Modifications - 314 Building

Technical Section has issued a work order for preparation of an informal request for funds to modify the existing melt plant in 314 Building. Design on the mechanical features is being accomplished by Plant Engineering. Technical Section is now investigating the vacuum systems and estimating the amount of rework and overhauling required to permit efficient operation.

2. Final Reporting

CA-516 - Gable-Butte Railroad

Construction progressed 1% to completion, and the Physical Completion Notice is being prepared.

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CG-573 - Hanford 3X Program - 300 Area

Construction progressed 1% to completion. The project is being closed out with exceptions on November 1. Information required for the Physical Completion Notice has been assembled. The total amount of allowable exceptions was $11,950, which includes $7700 for 24 Inconel-X die sleeves. Evaluation of canning tests indicates that the use of Inconel-X sleeves results in a greater percentage of acceptable pieces; therefore, the Potomic-M sleeves which were used as alternates are being discarded. The Metal Preparation Section has been requested to place the excess 12 hydraulic press units and two pump units in spare equipment standby status. All other equipment will be excessed.

ER A-766 - Liquid Waste Disposal Facilities, Building 108-F

Since a better use for the existing storage tanks has been found, this engineering request has been closed out at the request of Radiological Sciences Department.

ER A-3107 - Hanford Works Laboratory Exceptions

Except for EE-6206, all work orders issued by the Project Section have been closed out. The remaining work order is being held open until January 1, 1955, to cover engineering time.

3. Current Projects

CG-496 - Recuplex Installation - 234-5 Building

Design had been completed previously; overall construction progressed 9% to a total of 84%. The revised Directive authorizing $1,600,000 has been received, and it is estimated that this amount is sufficient for construction until January 1, 1955. A revised project proposal requesting additional funds for completion of the project is being prepared.

Progress during the month consisted of installation of process and service piping to hoods, chemical make-up room, and instrument piping in all the hoods. Electrical and instrument work on the panel boards was continued. Construction has progressed to the stage that reduction of personnel has begun.

CA-512 - 100-K Reactor Facilities

100-KW and 100-KE Water Plants

Overall design of water plants remained at 99.8%. Construction progress was as follows: KW progressed .8% to a total of 3.1% to a total of 94.4%; general facilities were 94.2% complete.

Two additional heaters were added to each 1500 HP motor at the 181 Building. These thermostatically controlled heaters are used to warm the lubricating oil during cold periods. Six permanent low-lift pumps and six temporary high-

lift pumps are installed in 190-KW Building. Acceptance testing of 165-KW was essentially completed, including switchgear. An unofficial inspection of the KW Water Plant buildings was made, and the list of several hundred incomplete items was discussed with the A.E.C. Area Engineer. The main items remaining in the KW Filter Plant were dichromate injection system, acid pumps, and chemical unloading pumps at the Head House. The overflow weir boxes at the 107 Building and some piping near the 150 Building are being modified.

One half of the KE Filter Plant was in operating condition, and controls are being completed for the other half. Flocculators and Monorakes have been installed, and instruments are being calibrated. Chemicals have been put in storage, and chemical feeders are ready for testing. In 190-KE Building, three permanent low-lift pumps have been installed at Stations #1, 3, and 4. The permanent high-lift pump has been installed at Station #1, and temporary high-lift pumps at Stations #3 and 4. All high-lift pump drive equipment was in place, and work was continued on piping, electrical controls, and heating and ventilating systems.

Acceptance testing of switchgear in 165-KE was essentially completed. The three boilers and two of the turbines have been given preliminary tests. Valve pit piping is being tied-in. Five of the pumps in 181-KE Building have been given heat runs, and two oil heaters have been added to each. A defective 5000-volt cable to motor #6 was replaced, and this unit was ready for testing.

The 107-KE Tanks have been cleaned and painted, and the overflow weir boxes are being modified. Alterations to both Substations have been completed. Final inspections were held for 1704 and 1707 Buildings, and operations personnel have moved into 1704 Building.

For 1706-K Building, siding and roofing were completed. Wheeler bottoms have been placed in Filters #1 and 2. Circulating pumps for effluent water were set in the heat exchanger for the "fish ponds". The loading dock of Building 1706 was removed when the excavation for Building 1706-KER was started.

100-KW and 100-KE Reactor Facilities

Construction progress on the 105-K Reactors was as follows: KW progressed .3% to a total of 99.6%; KE progressed 5% to a total of 92%. Correction of architectural and structural punch list items for 105-110-115-KW Buildings was about 50% complete. Final adjustments were being made to electrical, instrument, and ventilating and heating systems in the KW Buildings.

Acceptance testing of the KW Reactor was about 65% complete. Dynamic and hydraulic tests have been run. All connectors have been replaced on the inlet face, and two rows of tubes have been loaded to simulate a loaded pile for re-run of the Dynamic Flow Test. Additional "pigtail" connectors have been ordered for replacements on both KW and KE Reactors. The three charging machines for KW are undergoing final modification, and the three for KE are being modified likewise.

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Architectural and structural phases were being completed in 105-110-115-KE Buildings, and the Storage Basin monorail was completed with minor exceptions. All steam lines have been tested and flushed, and final repairs and tie-ins are being made. A.T.P. #1292, Testing of Gas Circulating System, has been completed without exceptions. Electrical work was completed in 115-KE and ready for final testing.

All nozzles on 105-KE Reactor were installed including 200 silicone-treated outlet nozzles which were installed at the request of Technical Section. Venturi fittings and dummies were installed. Horizontal rod controls are being prepared for final testing, and work on the Ball Third Safety System was continued. The air supply for vertical safety rods is being redesigned.

The acceptance testing began on the Solids Feed System and the pneumatic tests of crossheaders, nozzles, and process tubes. Final installation and testing work was being done on instrumentation and control systems. During testing, modifications and repairs are being noted and accomplished when possible.

CA-513 - Purex Facility - Part "A"

Design efforts during the month were concentrated on bid reviews, design changes, supplemental design, and the "as-built" program. Design on the ammonia scrubber was continued, and in coordination with the design of the Vacuum Acid Fractionator which belongs on the related project CG-598.

Construction for the overall project progressed 5.8% to a total of 79%, and the 202-A Building was about 77% complete. The 284-E Power Plant Addition was complete, and the 283-E Filter Plant Addition was completed except for clearing of punch list items. The roofing subcontractor completed his contract on October 14, 1954.

In the 202-A Building, Amercoat painting was completed through Cell "F", and painting was completed in the Decontamination Cell, Pool Cell, and Slug Storage Basin. The stainless steel liner was completed in Cell "L". Partitions are being placed in the Service Section, and wiring is being installed.

Welding in the Hot Pipe Trench was essentially completed, and punch list items are being cleared. Installation of pipe jumpers was begun in Cell "D", and 26 were installed by the end of the month. Fabrication was continued on jumpers for the Pipe and Operating Galleries. To date 724 pipe jumpers have been welded , 590 framed and balanced, and 560 tested. This represents a completion of about 53% of the work. Installation of ductwork throughout 202-A was 81% complete, and the overall heating and ventilating systems were 78% complete.

Major equipment installations included five Gallery Tanks, three Organic Storage Tanks and one centrifuge, and pumps and agitators in the Galleries. These installations completed the Organic Storage vessels and all Cell "E" vessels except the two centrifuges. In the Sample Gallery cap pit trays were installed in the Type "A" samplers, and lead shielding is being installed. Testing of air compressors has started.

Calibration of instruments in the Central Control Room was about 50% complete. Copper tubing connections are being made at both Head End and Central Control Room. Local panels are now being installed in Aqueous Make-Up. Instrument wiring through the concrete barrier wall into the canyon has been checked in "A", "B", "C", "D", and "E" Cells. All of the rejected Hammel-Dahl valves have been reworked and have been accepted by General Electric and the construction contractor. Acceptance tests have been started on instrumentation.

Gravity testing of tanks has been completed in 203-A Storage and 211-A Chemical Tank Farm. The tanks are being insulated, and pipe is being flushed and tested. Wiring for power lines and instrumentation is being installed. The 216-24A waste cribs and filter were completed. Connecting pipe was being installed, and painting of the Proportional Sampler Pit was in progress. Backfilling was begun in the area between the diversion box and the RR tunnel.

Mock-up work in the 272-E Building consisted of repairs to concentrators and assembly of liquid-liquid centrifuges. These portions of mock-up work are being supervised by factory representatives. Electricians have completed 110 electrical jumpers.

Installation of the 291-A Stack liner was essentially completed. Wash-down facilities are being fabricated and installed. Overall completion of the Fan House, Filter, and Gas Sampling Building was about 72%. The Gas Sampling Building structure was complete and awaiting installation of instruments and equipment. Both regular and Amercoat painting was being done, as well as other finish work. Outside utilities were about 94% complete, and outside facilities were about 73% complete.

At 241-A Tank Farm, concrete was placed for tank domes #101, 102, and 106. Reinforcing steel was being set on tank dome #5. Backfilling was accomplished in about 75% of the area. Installation of encasement betweens tanks and stainless steel pipe lines was in progress. The twin stainless steel lines to the CR Tank Farm were completed. A contract has been let for new work in the 241-A Tank Farm.

CA-513-D - Hot Semiworks Conversion

Design had been completed previously; construction progressed 2% to a total of 99%. Construction was completed except for start-up and painting in the cells. Painting is being delayed until calibration, cold runs, and start-up have been completed.

CA-514 - 300 Area Expansion Program - Production Facilities

Design completion remained at 99%; construction progressed 8% to a total of 72%. Building 3707-A, except for Patrol Headquarters, was turned over to Manufacturing Department. The new 6" autoclave vent line was installed, and eight autoclaves were turned over to Manufacturing Department on October 21, 1954.

The subcontractor is installing controls in the old 313 Building. Minor Construction has installed the exterior rolling doors and completed hook-up of heating and

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ventilating units. The telephone and fire alarm systems have been installed.

Equipment installations including ductwork and service pipe to the penetration etch machine, a second spray quench machine, and a portion of the furnace area conveyor system. The vendor's representative has finished run-in of the two remaining cut-off machines. Work in 3707-B Building was completed except for installing cabinets and door hardware.

CG-535 - Redox Capacity Increase, Phase II

Design remained at 99% complete; construction progressed 5% to a total of 81%. The 204-S Facility Addition was turned over to Manufacturing as ready-for-use about the middle of the month. Completed work included the following: piping at the 211-S tank, installation of process vessels in 233-S Building, erection of the instrument panel, erection of removable partition framework, installation of the monorail system, and load-out and recycle hoods.

The construction release for the Silica Gel Facility was issued on October 1. Excavation was begun for the waste line encasement and diversion box. Two sections of concrete encasement have been placed.

CA-546 - Fuel Element Pilot Plant

Following modification of the directive, detailed design percentage was lowered from 95% to 60% complete. Scoping for the semiworks area progressed rapidly. Firm equipment requirements for two process lines were established on October 27, 1954. Construction progressed 25% to a total of 55%. A great deal of the remaining work depends upon receipt of the fire wall partition. The three 500-MCM cables from the area substation to the building have been installed. Repairs to the damaged transformer were completed by Minor Construction on October 27, 1954.

CG-558 - Reactor Plant Modification for Increased Production

Although construction has started, no summary of progress has been devoted to percentage of completeness. Bids were opened for the process pump drives October 22, 1954. Apparent low bidder was General Electric Company with a total bid of about $2,016,000 for the 24 drives. The bid specified $84,500 per unit for the first eight units and $83,750 per unit for the remaining 16. The latter price per unit was also bid for the option items.

In the 190-DR Building underfloor conduit was installed, and concrete was placed in the south retaining wall and floor slab for the south vent room. Erection of structural steel has started in the north vent room. The ducts, piping, and surplus concrete slabs are being removed from process vent rooms. Site clearances for electrical work has started.

In 190-B Building, a line crew has started site clearances.

For the 100-DR and effluent line, a pneumatic vapor plug has been installed in the east effluent line. Work was continued in the White Bluffs Shops on tools and equipment for the HSR outage.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 20% to a total of 90%; construction remained at 25% complete, as compared with scheduled completion of 47%. The project proposal is being revised to request an extension of completion date to May 1, 1955. This request is necessary because of design of the backcycle and delays in construction of the sample gallery.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design of both phases had been completed previously; overall construction progressed about 4% to a total of 99%. The completed crib was accepted without exception. The Minor Construction portion of the project was essentially completed with the exception of installing two instruments which are scheduled for delivery during December, 1954. The pipe marker and liquid level indicator are being installed.

CA-431-C - Metal Examination Facility - 105-C

Design had been completed previously; construction progressed 10% to a total of 40%. Fabrication has been completed on the base plates for Basins #1 and 2. The loading tray on the Primary Inspection Manipulator is being modified.

CA-434 - New Bio-Assay Laboratory

Design had been completed previously; construction was about 98% complete. In recent months two of the existing hot plates have been remodeled. Since they have operated satisfactorily, and since vendors appear unable to supply the proper plates, the remaining four hot plates will be remodeled by the same methods.

CA-441 - Solvent Building

Design had been completed previously; construction progressed 10% to a total of 65%. Further progress on construction must await delivery of air conditioning equipment, hardware, and insulated steam pipe for underground placement. These deliveries are expected between November 1, 1954, and January of 1955.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Design had been completed previously; construction progressed 20% to a total of 50%. A revised letter project proposal has been submitted to request authorization of an additional $3500 for the GE-managed portion of the work. Dismantling of the 200-W Area tank was begun during October, 1954, and the contractor has scheduled

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the beginning of work in 100-D Area during early November, 1954.

CA-533 - Hanford Works Official Telephone Exchange

Design had been completed previously; overall construction progressed 2% to a total of 22%. Erection of the soffit block ceiling was completed. The heating and cooling unit has been moved into the utility room, and a work order has been issued to Plant Forces for tie-in of steam.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

With design completed, the revised project proposal requesting authorization for work to be performed by Minor Construction forces is being circulated for approvals. Drawings and specifications have been approved by General Electric Company.

CA-544 - Central Distribution Headquarters

With preliminary design about 15% complete, the project proposal was transmitted to the Manufacturing Department for approval.

CA-548 - Reactivate Project Proposal for New VSR Test Tower

With scoping completed, Design Engineering has been issued a design order for a new structural analysis of the existing tower.

CG-549 - Activate Task I, RMA Line - Building 234-5

Design had been completed previously; construction progressed 12% to a total of 24%. Six of the Task I hoods and the "Recuplex tie-in" hood, were completed and are being prepared for installation. Installation has begun on service piping from the Chemical Make-Up Room to the Chemical Addition Lines in Room 232. The solenoid valves and electrical wiring have been installed.

CG-551 - Expansion of 234-5 Building Facilities

Design had been completed previously; construction progressed 3% to a total of 66%. Shop testing of the hood lines was 50% completed. The remaining sweep motors are being run-in, and all major operating defects have been corrected. Installation of the walls and drop ceilings has begun. Three air cylinders are being changed to hydraulic on hoods #10-D and 13-MD.

CA-555 - Graphite Hot Shop and Storage Building

Design progressed 38% to a total of 98%. A "Design Progress Schedule" has been prepared for formal transmittal to A.E.C., and detailed design drawings are being routed for comments. Work Authority, FM-2937, was received on October 22, 1954.

CG-556 -X-Level Controlling and Recording Equipment

Design had been completed previously; construction progressed 17% to a total of 85%. The instrument piping was completed during the latter part of October.

Acceptance testing of the piping system was in progress.

CG-562 - Waste Metal Recovery Plant Modifications

Design had been completed previously; construction status was revised downward to 42% because of increased scope. All jumpers required for the project have been fabricated. Installation was in progress, and was completed between Cells 15 and 16. The existing Tank 8-7 has been removed from Cell 16, and the modifications of trench piping at Cell 8 was in progress.

CA-566 - Building for Prototype Physical Constants Test Reactor

Design had been completed previously; construction progressed 22% to a total of 42%. The contractor has placed the outer concrete walls of the building and is installing the floor.

At 2101-M Building fabrication of graphite for the Physical Constants Test Reactor was 95% complete. The remaining work consists of plugs, rounds, and some core parts that will not affect mock-up which started on October 28, 1954.

CG-572 - Particle Problem Animal Exposure Equipment

Design had been completed previously; construction progressed 4% to a total of 5%. Revision #1 of the project proposal is still awaiting authorization by A.E.C. Erection of the new walls was started October 19, and modifications of the lighting system was started on October 20, 1954.

CG-574 - Irradiation

Scoping and design are being managed by Design Section. Construction began and progressed to 1% complete. A revised project proposal is being prepared. A work order was issued to Plant Forces to fabricate and install 100 bucket-inserts and outriggers. Work has been started on this order to provide 50 units in early November and the second 50 units by the end of November, 1954.

CG-576 - General Improvements to Laboratory Area - 300 Area

Design had been completed previously; construction remained at 80% complete. Revision #3 of the project proposal is being routed for approval, and construction work has been suspended pending final approval.

CG-578 - Effluent Water Monitoring Improvements 100-B, D, F, DR and H Areas

Scoping and design are being managed by Design Section. Representatives of Design Section, Technical Section, and Project Section have visited the vendor's plant to assist with problems concerning design and engineering personnel.

CG-579 - Effluent Water Monitoring Improvements - 100-C Area

Scoping and design are being managed by Design Section. Representatives of

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Design Section, Technical Section, and Project Section have visited the vendor's plant to assist with problems concerning design and engineering personnel.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design had been completed previously; construction progressed 17% to a total of 98%, thus completing the project except for disposal of contaminated equipment.

CG-587 - TBP Waste Scavenging

Design had been completed previously; construction progressed 25% to an overall completion of 88%. Scope and design are being managed by the Design Section.

Progress during the month consisted of installing valves, a deep well turbine pump, and lines between the flush tank and the four cribs. The U. S. Geological Service is drilling the remaining test wells around the cribs.

CG-588 - Ammonia Scrubbers, Redox

Scoping and design are being managed by Design Section. Plant Forces are scheduled to begin fabrication of jumpers during late November, 1954. Pending arrival of proper materials, fabrication of waste neutralizer vent scrubbers was scheduled to begin during early November, 1954.

CG-589 - Dejacketing and Ultrasonic Equipment - 105-C Building

Design progressed 23% to a total of 55%. Design work was delayed by higher priority jobs; however, it is approximately on schedule.

CA-590 - Fly Ash Collection Equipment, Building 384

A revised project proposal is being prepared to provide additional justification.

CG-592 - Laboratory Supply Space, 3706 Building

At the request of Technical Section, this project is being held for consideration of an alternate method of handling and processing Caption 10 laboratory stores.

CG-594 - 221-T Building Roof Repair

Design had been completed previously; construction progressed 48% to a total of 70%. Removal of the old roof material has been completed. The expansion joint seals were about 75% finished, and application of the new roof was about 50% complete.

CA-595 - Car Pullers 184 Building Coal Yard - 100-B, D, F, and H Areas

Detailed design by Design Section progressed 45% to a total of 95%. Comments on the structural and layout drawings have been received. Specifications are now out for comment.

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CA-596 - Central Mask Washing Station - Building 2723-W Separations

Preliminary design progressed 85% to completion during the month. Detailed design was scheduled by Design Section to be started during early November, 1954.

CG-597 - Hanford 4X Program - B & T Plants, UO_3, and 300 Area

Scoping and design are being managed by the Design Section. Total authorized funds was $461,000.

Advance ordering of materials for the "B" Plant was begun. Preliminary testing and building rehabilitation progressed satisfactorily. A recommendation that the present UO_3 Plant be expanded to provide the required production capacity is being prepared for approval of the Design Council. For the 300 Area Plant, a request has been sent to the Design Council for guidance on the extent of back-up equipment to be purchased under the 4X Program.

CG-599 - Hanford 4X Program - 100 Area

Scoping and design are being managed by the Design Section. Total authorized funds was $300,000. Following receipt of bids for 1000 stainless steel buckets, the order was placed for delivery during January, February, and March of 1955.

CA-601 - 300 Area General Improvement Program

With preliminary design 80% complete, the project proposal was returned unapproved by A.E.C. It is recommended that measures proposed for erosion and dust control be reconsidered.

CG-602 - Remote Sampling - Hot Semiworks

Design progressed 75% to a total of 80%. Detailed design of the hood, hood piping, and hood support has been completed. A work release has been issued to Minor Construction, and advance procurement of essential material has been made.

CG-603 - Hanford 4X Program - Third Extraction Cycle "T" Plant

Scoping and design are being managed by Design Section. Construction progressed 40% to a total of 65%. Installation and testing of reworked "B" and "T" Plant jumpers have been completed. Fabrication of new jumpers was scheduled for completion during early November, 1954.

CG-605 - Installation of Additional Generating Capacity - 189-D

Design had been completed previously; overall construction progressed about 56% to a total of 60%. Installation of the A.C. and D.C. switchgear was completed, and the disconnect switches have been installed. Work continued on interconnection of wiring between the cubicles.

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CG-610 - Replacement of 313 Building Roof

With design 85% complete, the project proposal is being routed for approvals. The proposed work is to apply a 5-ply insulated roof to original sections of the 313 Building and to make minor repairs to the roof deck.

IR-181 - Temperature Control Improvement - 108-F Building

Design had been completed previously; construction began and progressed to 5% complete. Progress consisted of installation of coils and piping.

IR-183 - Study of Classified Scrap Disposal Problem - 300 Area Library

The informal request is being routed for G.E. approvals.

IR-184 - Tocco Induction Heating Unit, 314 Building - 300 Area

A design request has been issued, and procurement of critical materials was scheduled to begin during early November, 1954.

* * * * * * * * * * *

The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month.

ER A-758 - Mechanical Maintenance Shop Centralization - 100 Areas

The project proposal is being studied further by Manufacturing Department.

ER A-761 - Decontamination Facilities, First Aid Station - 100-H and 200-W Areas

Scoping work was started on the decontamination facility. Recommendations are being prepared for consideration by Health and Safety Section, and included is the layout of a proposed facility for the 200-W First Aid Station.

ER A-763 - Mobile Laboratory

With preliminary design completed, the project proposal is being routed for G.E. approval signatures.

ER A-764 - Fire Station Addition

The estimate indicated more cost than could be justified; so consideration is being given to renovating a portion of the present T.C. Fire Station Annex to provide habitable quarters.

ER A-765 - Painting Water Plant Structures - 100-DR Area

Information is being secured from paint vendors to determine proper materials, best method of application, cost, and other factors to be considered.

[redacted]

ER A-1213 - Metal Loading Facility, 105 Buildings

The project proposal is being written by the Design Section.

ER A-2749 - Sheltered Welding Manifolds - 200 Areas

With scoping 60% complete, the Manufacturing Department - Separations Section is reviewing work requirements that are to be included in the project proposal, and also studying possible changes in scope.

ER A-2751 - Removal of Task I and II R.G. Line

The rough draft of the project proposal is being reviewed by the Manufacturing Department.

ER A-6022 - Replacement of 146-FR Raw Water Supply Line

The requested study was about 90% complete. When photographs have been inserted, the report of the work performed and conclusions reached can be completed.

C. RELATED FUNCTIONS

The completion of 353 orders by vendor inspectors reduced the total number of orders requiring inspection of 558, a decrease of 28%. The net total of 558 includes 104 new orders received during October. The reduction of work load has alleviated the shortage of off-site inspectors; however, the work load in the Richland office has increased substantially. One supervising inspector for metallurgical work has transferred to Richland to strengthen the technical staff, and one engineer was assigned to the Purex project for coordination of deliveries and on-site inspection. The Corrosion Testing Program continued at the same rate with 260 samples being evaluated.

New castings for the secondary pumps for 100-K Area and pigtails for the Reactor units continued to receive intensive inspection. Two additional orders were placed for pigtails to replace those which failed because of metal fatigue during the Dynamic Flow Test. For the Purex facility, 26 of the 32 Pfaudler Tanks have been shipped. Additional inspection work was being done on the welded pipe which was returned to SWEPCO for reworking, and also on other Purex equipment. The problem of sintered rings for the Reactor Plant Modification has not been solved, and only a very limited quantity of L-10 rings has been produced. For the same project, 16 aluminum extrusions have been accepted, representing about 25% of the order.

Following is a resumé of inspection activities during the month:

Item	Number
Total orders on hand requiring inspection	558
Cumulative number of orders assigned to inspectors	531
Number of orders assigned to inspectors this month	103

[redacted]

DECLASSIFIED

Item	Number
New orders received by Inspection during the month	104
Orders completed	353
Total requisitions for engineered equipment transmitted for Expansion Program	69
Total orders of engineered equipment placed for Expansion Program	33

At the end of October there had been transmitted 3218 Expansion Program requisitions for engineered equipment, and 3195 orders placed.

Reproduction output decreased by 28% from the previous month to a total of 313,844 square feet. No overtime was worked. The largest orders processed during the month were 8023 prints for Reactor Modification and 4590 prints for 100-K Area.

Estimating completed 26 estimates during the month. The completed estimates comprised the following: project proposal - 10, fair cost - 2, and scope - 14.

Field Surveys completed the coal pile inventory in 200 Areas. The Unit continued to obtain preliminary date for the Reactor Modification Program, to provide control points for construction projects, and to provide routine survey services. One man assisted with optical inspection and control during fabrication of special equipment at Newark, New Jersey.

D. CRAFT LABOR

Voluntary terminations from Kaiser Engineers and associated subcontractors totaled 5.6%, while voluntary terminations from Blaw-Knox and associated subcontractors increased slightly to 11%. A settlement was reached in early October on the labor dispute concerning craft affiliation which occurred between pipefitters assigned to 300 Area Expansion Program and pipefitters employed by a vendor, Pacific Oerlikon Company.

Discussions have been held with local Building Trades representatives concerning construction work assignments as they are affected by the Davis-Bacon Act. The position of General Electric Company appears to be satisfactory; however, the discussions were continued.

REPORT OF VISITORS

To Hanford

C. R. Goetjes, Pacific Air Reduction Company, Seattle, Washington, visited W. Seeburger, Minor Construction Management Unit, on October 20, to demonstrate equipment.

H. Orr, Stearns-Roger Manufacturing Company, Denver, Colorado, visited R. C. Hollingshead, Separations Projects Sub-Section, on October 26, concerning operation of pulse generators.

[redacted]

R. J. Aronson, Aronson Hardware Company, Seattle, Washington, visited W. Seeburger, Minor Construction Management Unit, on October 28 to demonstrate equipment.

Official Trips to Other Installations During October, 1954

H. E. Hanthorn visited Crane Company, Chicago, Illinois, on October 11 conerning disposition of excess inventory.

J. R. Kelly visited Huntington Rubber Mills, Portland, Oregon, on October 11 and 12 to select neoprene hose material for 105-K connectors.

G. G. Taylor visited Chicago, Illinois, from October 18 to 22 to attent a meeting of the National Safety Congress.

J. C. Hamilton and R. B. Socky visited Los Angeles, California, from October 18 to 22 to serve as witnesses in the law suit between Allied Aluminum Company and Western Gear Works.

[redacted]

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MONTHLY REPORT

ADVANCE ENGINEERING SECTION

OCTOBER, 1954

Calculation of isotope yields during extended irradiation of uranium fuel slugs enriched to 1.08% and to 1.75% uranium-235 was completed during the month. In addition, calculation of isotope yields was completed for a single hypothetical case of thorium fuel slugs alloyed with 1.65% uranium-235.

The economic review of plutonium costs for various operating conditions has been extended to include the old piles. With high irradiation cost the incentive for irradiating to high accumulated exposure is markedly reduced.

W. K. Woods

ADVANCE ENGINEERING
ENGINEERING DEPARTMENT

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - OCTOBER, 1954

PERSONNEL PRACTICES SECTION

The number of applicants interviewed in October was 1,748 as compared with 1,788 for September. In addition, 82 new applicants applied by mail. Open, nonexempt, nontechnical requisitions increased from 340 at the beginning of the month to 559 at month end. Most of this increase resulted from additional requirements for Separations Utility Operators between now and mid-1955. One hundred and thirty-eight employees were added to the roll and 75 removed during the month. Separations rate decreased from 1.63% for fiscal month of September to .80% for fiscal month of October. These rates when converted to annual basis are 17% and 10.43%, respectively. During October, 80 new requests for transfer to other type work were received by Employment, and 39 transfers were effected. Attendance recognition awards were distributed to 200 employees in October, including 28 who qualified for four-year awards.

Five employees retired and two employees died. One hundred and one visits were made to employees confined to Kadlec Hospital, and 42 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 98.1%, in the Insurance Plan 99.3%, and the Employees Savings and Stock Bonus Plan 50.1%. At month end there were 845 registered under Selective Service and 805 military reservists were on the roll. Since August 1, 1950, 368 employees have terminated to enter military service, of which 127 have returned, 21 have not claimed reemployment rights, leaving 220 still in military-leave status.

Forty-four adopted suggestions were approved for awards in October, resulting in cash awards totaling $1,035.00 with a total net savings of $7,579.35.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS SECTION

The News Bureau issued 61 releases during the month. Six manuscripts were approved for release during the month and six speeches were delivered before public groups in Richland and Yakima, Washington. The Community News Letter was written and distributed to community leaders in Pasco, Kennewick, and Richland. Six Management News Bulletins were developed and distributed to all exempt personnel during the month.

A birthday party for Hanford's eight GE 75th Anniversary babies was held on October 15. Local and regional newspaper and radio publicity was arranged, and a television news feature on the party was used by four Northwest TV stations.

An estimate of cost for preparation of the "1954 at Hanford" report was prepared and submitted to a representative of Advance Engineering. Preliminary work has started on format design, typography, and general art layout.

A total of 282 photographic assignments were completed this month, and 11,720 prints were produced.

Employee and Public Relations Summary

SALARY AND WAGE ADMINISTRATION SECTION

A limited salary survey was conducted with eight firms located in California. Six of these firms are engaged in architect-engineering work, while the other two represent the petroleum industry. Salary information was obtained on a total of 21 positions; about one-half of these positions have been reconciled elsewhere in the Company while the balance represents positions which are either peculiar to HAPO or else have not been reconciled as yet within the Company. The data obtained is being analyzed.

A review of Position Guides, titles, and evaluations was completed for the Manufacturing, Engineering, Radiological Sciences, and Employee and Public Relations Departments. Addition of accountability and authority factors to all supervisory Position Guides was completed.

Re-evaluation work in connection with the reorganization of the Financial Department and the distribution of the Plant Auxiliary Operations Department was completed.

The Salary Administration Manual was revised, reprinted, and distributed. Position Relationship Data Sheets were brought up to date. Authority was received to adopt the new Company Salary Plan. A new Exempt Employee Appraisal Plan was completed.

The regular quarterly report for the period ending September 30 was prepared and distributed.

Considerable progress on the proposed job evaluations plan for nonexempt employees was made following the first sectional meeting, at which preliminary plans were outlined. Jobs were segregated in related groups. Supervisors were contacted and the first draft of some of the plans was completed.

UNION RELATIONS SECTION

The official certification of the Hanford Atomic Metal Trades Council as the collective bargaining representative of 16 Material Expediters and Take-Off Men in the Manufacturing Department was received from the National Labor Relations Board on October 14.

As a result of a demand for the Company to arbitrate a provision of an on-the-job working procedure signed by Patrol supervision and the Hanford Guards Union, an understanding was reached with the Union on October 15 which firmly established our position in regard to the status of working procedures that are formulated for use in various work locations.

In view of the fact that an agreement with the HAMTC in January 1953 has accomplished the transfer of as many people out of Community as would voluntarily accept such transfers, the agreement was officially terminated on October 5. HAPO collective bargaining units accepted our proposed revision in the Pension Plan resulting from a recent change in the Social Security Law.

Employee and Public Relations Summary

UNION RELATIONS SECTION (Continued)

During the latter part of the month, several discussions have been held with the Building Trades representatives concerning work assignments as they are affected by the Davis-Bacon Act. No further protests have been received from the Millwrights concerning the temporary machining being performed by Machinists in the 2101 Building.

EDUCATION AND TRAINING SECTION

There are 39 Technical Graduates on the Rotational Training Program as compared to 42 in September. Placements from the present limited pool of rotational trainees are being made very carefully to fill major needs. Needs for young engineers in the several departments have been carefully surveyed, and a requisition has been issued for the hiring of additional trainees.

In the School of Nuclear Engineering 14 graduate and 8 college-level courses are continuing with a total paid enrollment of 275, a 20% increase over Fall 1953. Of 133 students at graduate level, 122 are now affiliated or planning to affiliate with associated colleges. Graduate study toward a degree in nuclear engineering is under discussion with these schools and has been approved in principle by one.

The existing program of Personnel Development Training Program continues while some of the present programs are being re-studied for improvement. Surveys now underway will measure the numbers of employees in each department who might attend each of our major programs to aid in further planning. Discussions now underway with various managers are expected to indicate some additional training services that might be of value.

HEALTH AND SAFETY SECTION

There were no major injuries during the month of October. The minor injury trend remains very favorable in 1954. There were 257 Plant minor injuries during October as compared to 272 in September.

The Fire Prevention Activities during the past month were climaxed by the Fire Prevention Display Contest. The 300 Area was awarded the honor for the best general display.

A big increase in communicable disease was due largely to a continued rise in the incidence of chickenpox and an outbreak of ringworm.

AUXILIARY OPERATIONS AND PLANT PROTECTION SECTION

The number of documents unaccounted for remained at 228 for G.E. Since the establishment of monthly inventories in August, only one document has been recorded as unaccounted for during the three-months period.

Construction of the new 700 Area official telephone exchange was approximately 78% complete as of October 22, 1954. The contractor-installed cable system in 100-K Area was tested and inspected. Minor exceptions were noted and cleared. Interim operation of the 100-K manual switchboard will be necessary until the dial exchange is completed in April, 1955.

AUXILIARY OPERATIONS AND PLANT PROTECTION SECTION (Continued)

Physical inventory of the 5,157 office machines on record will be taken during the first two weeks of November. Volume of work done by Plant Mail, Addressograph, Printing, and Duplicating remained at a high rate. A duplicating office was established in the 100-K Area on 10-28-54, and a new plant mail sub-station will be established there early in November. These additional locations will provide relief for 700 facilities.

COMMUNITY SECTION

The Commission requested us to have 65 prefabs moved in order that certain lots would meet minimum requirements at the time of disposal. All tenants vacated their premises by October 1, 1954. Of the total to be removed, 26 have been removed by the new owners. Utility lines are capped and the ground leveled after removal.

It was announced that effective April 1, 1955, residential lot lines would be determined by the metal lot line stakes. Parking compounds and driveways are to remain as they are until the property is sold.

ORGANIZATION AND PERSONNEL

Effective October 15, 1954, an Auxiliary Operations and Protection Section was established in the Employee and Public Relations Department, and the Graphics Unit became a part of the Employee Communications and Public Relations Section of the Department. These organization changes resulted from the dissolution of the Plant Auxiliary Operations Department.

Total on roll October 1, 1954	847
Accessions	969*
Separations	34
Total on roll October 31, 1954	1782**

*This figure includes 928 employees in the Auxiliary Operations and Plant Protection Section and 15 employees in the Graphics Unit transferred from the Plant Auxiliary Operations Department.

**Total includes 39 Rotational Trainees.

Employee and Public Relations

PERSONNEL PRACTICES

Employment

	September, 1954	October, 1954
Applicants interviewed	1,788	1,748

382 of the applicants interviewed during October were individuals who applied for employment with the Company for the first time. In addition, 82 applications were received through the mail.

	September, 1954	October, 1954
Open Requisitions		
Exempt	--	1
Nonexempt	340	559

Of the 340 open, nonexempt, nontechnical requisitions at the beginning of the month, 246 were covered by interim commitments. Of the 559 open, nonexempt, nontechnical requisitions at month end, 240 were covered by interim commitments. Most of this increase resulted from additional requirements for Separations Utility Operators between now and mid-1955. During October, 106 new requisitions were received requesting the employment of 355 non-exempt, nontechnical employees.

	September, 1954	October, 1954
Employees added to the rolls	100	138
Employees removed from the rolls	153	75
NET GAIN OR LOSS	-53	+ 63

Separation Rate:

Fiscal Month September, 1954		Fiscal Month October, 1954	
Male	Female	Male	Female
1.16%	3.73%	.57%	1.81%

Over-all Separation Rate:

Fiscal Month September, 1954	Fiscal Month October, 1954
1.63%	.80%

Employee and Public Relations

PERSONNEL PRACTICES

During October, 14 employees left voluntarily to accept other employment, 6 left to enter military service, and one left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-54	573
Number of requests for transfer received during October	80
Number interviewed in October, including promotional transfers	83
Transfers effected in October, including promotional transfers	39
Transfers effected since 1-1-54 including promotional transfers	436
Transfers effected in October for employees being laid off	---
Number of stenographers transferred out of steno pool in October	4
Transfer requests active at month end	298

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	3	107	--	110
Re-engaged	-	--	--	---
Reactivates	-	25	--	25
Transfers	3	--	--	3
TOTAL ADDITIONS	6	132	--	138

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	13	41	--	54
Removals from rolls(deactivates)	-	18	--	18
Transfers	3	--	--	3
TOTAL TERMINATIONS	16	59	--	75

GENERAL

	9-1954	10-1954
Photographs taken	177	302
Fingerprint impressions	156	162

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	9-1954	10-1954
General Electric cases	107	101
Facility cases	27	20
Total	134	121

Employee and Public Relations

PERSONNEL PRACTICES

Effective 11-1-54, the scroll copy of the P.S.Q. will be transmitted to A.E.C. There will be no more photostats. As a matter of documentation, the original scroll copy of the P.S.Q., on all cases transmitted to A.E.C. prior to 11-1-54, will be found in the GE personnel folder. Effective the first of November, any and all scroll copies will be in the hands of the local office of the A.E.C.

Supervisory Selection Program - Twenty-eight candidates were administered the test batteries, the results interpreted and relayed to the section evaluators.

Clerical - Tests were used in 38 cases to aid in the selection of clerical employees.

Instrument Trainees - Three prospective instrument trainees were tested, one is being considered further.

Personnel Records and Investigation

INVESTIGATION STATISTICS	9-1954	10-1954
Cases received during the month	148	149
Cases closed	171	137
Cases found satisfactory for employment	116	118
Cases found unsatisfactory for employment	8	32
Special investigation conducted	7	4
Cases closed before investigation completed	25	24

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	4834
One-year awards made in October for those qualifying in September	47
Total two-year awards to date since January 1, 1950	2500
Two-year awards made in October for those qualifying in September	65
Total three-year awards to date	1237
Three-year awards made in October for those qualifying in September	60
Total four-year awards to date	408
Four-year awards made in October for those qualifying in September	28

SERVICE RECOGNITION

Total Service Recognition Pins presented to date	4305
Five-year Service Recognition Pins presented during October to exempt personnel	8
Five-year Service Recognition Pins presented during October to nonexempt personnel	12
Twenty-year Service Recognition Pins presented during October to exempt personnel	2

During October, 16 people whose continuity of service was broken while in an inactive status were so informed by letter.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	101
Salary checks delivered to employees at Kadlec Hospital	34
Salary checks delivered to employees at home	8

At month end, participation in the Benefit Plans was as follows as compared with last month's participation:

	September	October
Pension Plan	97.9%	98.1%
Insurance Plan	99.2%	99.3%
Savings and Stock Bonus Plan	49.6%	50.1%

Fifteen letters were written concerning deceased employees and their families during October, regarding payment of monies from the Company and answering questions.

Two employees died during the month, namely:

Maurice O. Triem	M-1998-546	Engineering	10-6-54
Cecil N. Faust	W-4482-616	Manufacturing	10-20-54

Since September 1, 1946, 156 life insurance claims have been paid totaling $999,013.

Five employees retired during the month of October, namely:

Raymond A. Winchester	W-9450-923	Optional Retirement
Arthur P. Nelson	W-9362-410	Normal Retirement
Otto C. Selle	W-6275-637	Normal Retirement
E. L. Fritjofson	W-5837-342	Normal Retirement
G. A. Foster	W-5549-617	Normal Retirement

During October, 38 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date 319 employees have retired at Hanford, of which 163 are continuing their residence in this vicinity.

A total of 119 new employees attended Orientation Programs given by members of this group during the month of October. Of this number 95.8% have signed to participate in the Pension Plan, 100% have signed to participate in the Insurance Plan, and 89.9% have signed to participate in the Good Neighbor Fund.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

To date, 1710 cards have been received from non-participants in the Nucleonics Employees Good Neighbor Fund. Of this number, 335 have signed up to become members. The percentage of non-participants signed up is approximately 19 per cent. In addition, considerable time has been spent by this group in preparing a list of names for the various section managers of their people who are not participants and have, to date, not returned their cards to us. The present percentage of participation in the Good Neighbor Fund is 70.4%.

Considerable time was spent during the month tabulating the Weekly Employee Rating sheets. The majority of ratings have been received, although there are a few sections that have not as yet returned an appreciable number. The Section Managers of these sections have been contacted by phone and requested to submit their ratings at an early date.

On October 18, Margaret I. Baker transferred from Records Control Unit to the Employee Services Unit to fill the new position of Women's Advisor. During the first week of her new assignment, several requests were made for her counseling services including requests from supervisors as well as employees.

As the names of those employees who had not received their stock certificates came to our attention, their current mailing addresses were forwarded to Schenectady. O. M. Corrigan's office in Schenectady has now compiled a complete list of HAPO employees who have not yet received their stock certificates and they should be receiving them soon, after current addresses are provided.

With the concurrence of Personnel Practices, Finance, GE Supply Corporation, and the two local GE dealers, sales certificates for the purchase of major appliances, radio and TV sets, and home heating furnaces, will be issued after purchase rather than before purchase. This is another step taken to make it easier for GE employees to buy our products at the employee discount.

Recently it was brought to our attention that certain reservists may be dismissed from the reserves for failure to acquire sufficient annual credit points. In some instances this may mean reclassification to 1A for some of our employees who are reservists. Further inquiry is being made of the Washington Military District in Seattle concerning this matter.

Military Reserve and Selective Service

Statistics with respect to employees who are members of the military reserve are as follows:

Number of reservists on the rolls		805
Number of reservists classified in Category A	117	
Number of reservists classified in Category B	82	
Number of reservists classified in Category C	60	
Number of reservists classified in Category D	546	

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Service

Number who returned to active duty to date		143
Number who returned to active duty in October		0
Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	2	
Number of reservists classified in Category D	40	
Delays requested (including renewals)		114
Delays granted		106
Delays pending		0
Delays denied		5
Delay requests recalled		3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		845
Employees registered who are veterans		319
Employees registered who are non-veterans		526
Deferments requested to date (including renewals)		1379
Deferments granted		1104
Number of employees for which deferments have been requested		134
Number of employees classified in Category B	0	
Number of employees classified in Category C	1	
Number of employees classified in Category D	133	
Deferments denied and appealed at state levels		20
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		2
Deferments denied by local board and not appealed		16
Deferments denied by state board and not appealed		48
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		2
Deferments requested, later withdrawn		2
Deferments pending		44

Military terminations since 8-1-1950 are as follows:

Reservists recalled		119
Selective Service		244
Women employees enlisted		5
	TOTAL	368

Employees returned from military service:

Reservists		63
Selective Service		64
	TOTAL	127

Known number not claiming reemployment rights 21

Number of employees still in military-leave status 220

Employee and Public Relations
PERSONNEL PRACTICES SECTION

Technical Recruitment

Three invitations were extended to PhD's for Richland visits, and two of these, a metallurgist and a physical chemist, plan to visit during November. Four other PhD's (one chemist, two chemical engineers, and a theoretical physicist) have accepted our invitations and will visit during coming months. In addition, there are three open invitations. During October, five offers were extended, one acceptance (theoretical physicist) and three rejections (two physicists and one chemical engineer) were received. There are currently six offers open (four physicists and two chemists). HAPO participated in the Company-wide PhD recruiting effort at Ohio State, Michigan, Michigan State, Iowa State and Notre Dame, but returns are not yet in. All PhD recruiting dates are now scheduled, and HAPO representatives will be present at 27 of the major graduate schools.

One additional offer was extended and accepted for the Rotational Training Program, bringing the total acceptances to 35, with 2 of these yet to report for work. There is one offer still open as a result of last year's BS/MS recruiting effort. A blanket requisition for 82 new technical graduates was received. These requirements are to be filled from mid-year graduating classes and other sources, including other Company training programs where possible. Campus recruiting is planned at 31 to 35 colleges and universities during the fall. During October, HAPO representatives participated in BS/MS recruiting at Rice, Texas, Arkansas, Oklahoma, Oklahoma A & M and Iowa State.

The status of experienced BS/MS candidates may be summarized as follows:

To Visit	Offers Ext.	Offers Accepted.	Offers Rej.	Open Offers	Reported
2 (Nov.)	1	2	2	2	6

Anticipated requirements for experienced engineers and scientists will necessitate an expanded effort during coming months.

Of a total of 21 technical employees who left employment at HAPO, 6 entered military service, 8 left to accept other positions, 1 returned to school, 2 terminated for other reasons, 3 transferred to other GE installations, and 1 was a summer junior who returned to school. These figures include terminations through October 31, 1954.

EMPLOYEE AND PUBLIC RELATIONS

WORKMEN'S COMPENSATION AND SUGGESTION PLAN

Suggestion Plan	September	October	Total Since 7-15-47
Suggestions Received	202	255	14915
Acknowledgements to Suggesters	212	228	
Suggestions Pending Acknowledgement	31	58	
Suggestions Referred to Depts. for Investigation	266	372	
Suggestions Pending Referral to Departments	43	79	
Investigations Completed and Suggestions Closed	204	248	
Suggestions Adopted - No Award	0	0	
Adopted Suggestions Approved by Committee for Award	52	44	
Total Net Cash Savings	$ 6,349.32	$ 7,579.35	
Total Cash Awards	$ 890	$ 1,035	
Total Suggestions Assigned to Field for Investigation	646	641	
Total Number Suggestions Outstanding to Departments	644	628	

The highest award of $100 was paid to an employee in the Technical Section for his suggestion to revise the can used as a container for a ruptured slug. Savings in labor and material was realized through adoption of this suggestion.

Operation 4-S continued throughout October and a significant increase in suggestions received was noted for the month.

W. D. Smyth attended the NASS Convention in Chicago on October 18 and 19. At this convention, in response to a request by R. C. Reed, Manager, Employee Benefits Procedures, Schenectady, Smyth gave a report to all General Electric personnel in attendance concerning HAPO's suggestion activity and more particularly an outline of Operation 4-S. The group displayed considerable interest in this program and requested to be advised of the results of the program.

In April, 1954 the total number of suggestions outstanding was 1115. Due to a concentrated program intended to reduce this figure the total number of suggestions outstanding at the end of October was 826 of which 60 were being reproduced. Our objective is to reduce that figure to approximately 500 or less.

The quarterly report ending September 30 prepared for the Financial Department revealed the following:

1. Percentage of adopted suggestions to those received was 38.5%. This is a significant increase over previous averages.

2. 210 more suggestions were acted upon during the quarter than were received. This indicates all departments are attempting to reduce the back log of outstanding suggestions.

3. The ratio of awards to savings was 14.6% which is a significant increase over previous averages in this category.

Suggestion Plan (Continued)

Tape recordings covering the Suggestion Plan episode of the radio series, "Inside Hanford", were completed on October 22. Originally it was intended to air this program on Thursday October 28, 1954, however, due to other station commitments the program will be broadcast on Thursday, November 4, 1954. Briefly, the program consists of a trip starting in the Suggestion Office and terminating with personal interviews of three suggesters in various parts of the plant.

Life Insurance

Code information which is known only to Home Office Life Underwriter's Association has been furnished 49 insurance companies and investigation agencies during the month of October, 1954. This is in accordance with an arrangement with the Underwriters whereby employees on this project might be insured on the same basis as those working elsewhere.

Insurance Statistics

	September, 1954	
Claims reported to Department of Labor and Industries	Long Forms	Short Forms
	45	374
	October, 1954	
	Long Forms	Short Forms
	52	322

Total Since Sept., 1946 - 22,768

	September, 1954	October, 1954
Claims reported to Travelers Insurance Co.	6	*12

Total Since Sept., 1946 - 903

*Of the claims reported to Travelers Insurance Company during the month of October all were property damage claims.

Liability Insurance

Milo Riste vs. General Electric Company and Dr. P. A. Fuqua, B-6835809. On October 22, 1954, Judge B. B. Horrigan, Franklin County Superior Court, issued a Memorandum Decision in which he sustained the Demurrers filed by General Electric and Dr. P. A. Fuqua. This decision upheld our contention that the Statute of Limitations barred any recovery by the plaintiffs in this action. Mr. Riste can either appeal Judge Horrigan's decision to the State Supreme Court or amend his Complaint and sue under another theory. We have been unofficially advised that Judge Horrigan's Decision will be appealed. On October 25, 1954, Mr. Riste presented himself to the Employment Office seeking reinstatement as a General Electric employee.

Employee and Public Relations

PERSONNEL PRACTICES

Curtis Swearingen vs. General Electric Company and Dr. P. A. Fuqua, B-6835841. Judge Horrigan's decision in the Riste vs. General Electric is applicable to the Swearingen case and dismissal will be entered in both cases for signature of Judge Horrigan.

John R. Meloy vs. General Electric Company and Dave Casey, B-6835755. On October 25, 1954, Travelers Insurance Company submitted notice to General Electric and the Commission that their evaluation of the case was placed at $7500 maximum. John Gavin, Travelers' Attorney, recommended that settlement negotiations begin at $5000 plus $800 special damages with a maximum of $7500. Travelers requested General Electric and AEC tentative approval of this arrangement, however, on November 1 we requested that Travelers require Mr. Meloy to submit to a more recent physical examination since it has been almost a year since his latest physical and it is our position that Mr. Meloy's condition is more probably fixed at this time than it was a year ago.

Homer Snyder vs. General Electric Company and G. H. Fisher, B-6835621. A Respondents Brief was filed in Supreme Court by Travelers' attorney citing additional authorities in support of the brief previously filed.

Employee and Public Relations

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During the month of October, the News Bureau issued 61 releases, the highest total for one month so far this year. The breakdown by category, distribution and content was as follows:

Subject		Distribution	
Pay and Benefits	7	Local	42
Employment Services	19	Daily	1
Good Will	8	Columbia Basin NEWS	2
Technology and Research	7	Special	16
Safety and Fire	2		
Real Estate	4	Content	
Administration & Legal	1		
Richland-Hanford Protection	1	Information	5
Education and Library	7	Pictures	5
Health, Medicine	1	Short release	39
Plant Services	3	Long release	8
Organization Changes	1	Feature	4
Total	61		

Of the 42 local releases listed above, one was also sent to the Business list and one was sent to the Weekly A list.

A picture feature showing the "dish washing" operation necessary to clean test tubes and beakers used in the Radiological Sciences Department labs was sent to 21 women's page editors scattered from California to Maine. Another picture release was called "atomic antifreeze," distributed to 20 selected daily newspapers. In each case, notes were written to the editors assuring them that they had the picture on an exclusive basis in their area.

The General Electric Retired Employees had their annual dinner party during the month. Stories and pictures were given to the local papers and also distributed widely. This information release also was sent to the MONOGRAM and Schenectady News Bureau for their information and possible use.

Two picture features, which included "how-to" articles, were sent to two separate lists of magazines. One, concerning a safety chart originated at Hanford, was sent to a list of safety magazines. The other concerned door panel guards around inside door handles of automobiles, and was sent to a list composed of such magazines as POPULAR MECHANICS.

A number of pictures with explanatory written material were selected to illustrate engineering progress at Hanford. They were sent to Schenectady for possible use in an insert the Company is preparing for SCHOLASTIC magazine.

There were four requests for information about Hanford and Richland during the month. One of the requests was from a shareowner concerning research with radioactive materials on growing plants. Several articles and write-ups concerning

the work of the Biology Section were sent to him. A booklet entitled "Hanford" was prepared to be used in answering casual requests from students. It consists of a group of newspaper and magazine articles and pictures reproduced by xerography.

A status report on signed articles, covering a period from March 1 to October 15, 1954, was completed during the month. The report was addressed to the Department Manager, with carbon copy coverage of the General Manager of the Atomic Products Division, the HAPO General Manager, Department Managers, AEC offices at Hanford and Washington, D.C., and GE Public Relations personnel in San Francisco, New York and Schenectady.

A photograph of Hanford's plastic man appeared on the cover of the November issue of WESTERN INDUSTRY.

The following speech and magazine article manuscripts were approved this month:

"Hanford Reactor Technology," by O. C. Schroeder, October 26, speech for Milton-Freewater Rotary.

"Modifying Reactor Control System Requirements During Reactivity Transients," by R. D. Schilling, for April, 1955 Nuclear Engineering Conference at UCLA.

"On the Nonlinear Equation of Heat Conduction," by P. M. Anselone, D. O. Banks, and R. Y. Dean for publication in the AMERICAN JOURNAL OF PHYSICS.

"Preparation of Carrier-Free Radioruthenium by Volatilization from Fission Product Mixtures (1)," by K. M. Harmon, C. F. Callis, and L. H. Clark, for publication in the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY.

"Effect of Body Distribution and Retention of Tritium on the Hazard of Exposure to Tritium Oxide, " by R. C. Thompson and H. A. Kornberg, for publication as an unclassified formal report.

"Recommendation Report on Outfall Line Repairs," by E. S. Bell, Jr., for submission for a Professional Engineer's License.

The following speeches were arranged during the month:

Presentation or Submission date	Subject and Organization	Author
10/6	"What General Electric Looks For in a Job Candidate," Jr. and Sr. High School Students, Yakima	G. D. Barr
10/7	A Biological Demonstration, Teacher's Institute, Pasco	T. W. Galbraith
10/12	"Human Relations," Richland Rotary	V. J. Byron

Employee and Public Relations

10/12	"Hanford Reactor Technology," First Presbyterian Church, Yakima	O. C. Schroeder
10/15-16	Work Shop, Washington Jr. Colleges, Yakima:	
	"Job Requirements at Hanford"	G. D. Barr
	"Promises of the Atomic Age"	W. K. Woods
	"Uses of Radiological Materials in Biological Research"	F. P. Hungate
	"What Industry Expects of College Students and How Colleges Can Better Equip Students for Work in Industry"	D. W. McLenegan
11/2	"The Future of Atomic Energy," Richland Chamber of Commerce	W. E. Johnson

The Community News Letter was written and distributed to community leaders in Pasco, Kennewick and Richland.

Subjects emphasized in GE NEWS lead and feature stories during September included: Operation 4S cost reduction; release on "atomic antifreeze"; plant-wide health slogan contest; Community Chest Drive; candidates for the Good Neighbor Fund Board of Trustees; fire prevention; activities of the Instruments and Electrical Unit in the repair and maintenance of all types of portable and shop test instruments; 75th Anniversary of the first incandescent electric lamp; move of Transportation facilities; new Employee Purchase Plan procedure; story urging residents to register for voting; Separations Safety Stampede.

A birthday party for Hanford's eight GE 75th Anniversary babies was held on October 15 in the Desert Inn. Six babies and their parents attended. Local and regional newspaper and radio publicity was arranged and a television news feature on the birthday party was sent to four Northwest TV stations. KIMA, Yakima carried the feature in the 6:30 newscast, October 18. KING -TV in Seattle telecast it on both the 6:30 and 10:30 p.m. newscasts on October 18, KOIN-TV Portland used it during their 11:45 a.m. newscast on October 19, and KXYL-TV Spokane carried the feature on Thursday. October 21 in their 6:30 p.m. newscast. Confirmation of telecast times and comments that news features from Hanford of this quality would be welcomed in the future were received from all of the stations concerned.

Plans for showing birthday party movies to parents of the Anniversary babies were made. The showing will be held early in November.

Six Management News Bulletins were developed and distributed to all exempt personnel during the month.

Operation 4S Cost Reduction--Suggestion System Program was promoted during the month through use of paycheck envelope stuffers, locally-produced posters, and Management News Bulletin items.

An information program, developed to promote Good Neighbor Fund Drive, was put into operation. It included GE NEWS and Management NEWS bulletin items, and the posting of a locally-produced poster throughout the plant.

Employee and Public Relations

A proposed letter to members of the Management Information Group on recent changes in the Fair Labor Standards Act was written and approvals obtained.

The October Safety topic, "It Could Happen," and the October Health topic, "Unseen Troublemakers," were distributed. Copy and art work for the November Health Bulletin and November Safety Topic were developed, and both items placed in production.

Reprinting of the radiation information bulletin "Fair Warning," for distribution to all Manufacturing employees, was effected through Central Printing.

Fifty copies of the booklet, "A.B.C.'s of Stocks and Bonds," were received from the New York office. Thirty-six copies were sent to employees who requested this booklet.

Nine thousand copies of the booklet "Gotta Grievance" were ordered at the request of Union Relations. They will be distributed to all nonexempt employees and all members of management in connection with a program for re-informing employees of the purpose and mechanics of using the grievance procedure.

Community Operations Annual Report booklets were received from commercial printers after considerable delay (original delivery date was Oct. 1) and will be made available to Richland residents.

Plans were laid with Technical Recruiting to develop locally a booklet to be used for recruiting Ph.Ds for HAPO. Target date is January 15, 1955.

October issue of "Your Manufacturing Month" was completed and distribution was arranged.

One thousand copies of a poster promoting efficient office filing methods, designed by commercial artist, were ordered through Central Printing.

Film showings during the month totalled 77, combined audience 1575.

About 100 persons attended the special preview of G-E's two motion picture releases, "The Atom Goes To Sea," and "The Story of Light," conducted for HAPO management this month in the North Hall of the Richland Library.

Posters placed throughout the plant during the month included: four Elliott Service Company posters (cost reduction theme), one Good Neighbor Fund poster, and two sets of Operation 48 posters. In addition Suggestion boxes were serviced and two new suggestion boxes posters were inserted. A total of 2550 copies of six different booklets were placed in the Employee and Public Relations information racks during the month.

Art work during the month included: retouching 26 photos, and developing rough visualizer of waste retention cribs, storage, etc. to accompany news story being sent to a national publication; layout and final art work for the November

safety topic, November health bulletin, and the radiation booklet were developed; revisions to the "here's hanford" booklet, layout and final art work for a records control poster, 4S program visualizers prepared at the request of the Suggestion System secretary, work on a TV title card for use in conjunction with the birthday party for HAPO anniversary babies and photo framing and type layouts for Bioassay.

Several meetings were held this month with AEC and G-E personnel concerned with the Construction Progress Motion picture program. The purpose of the meetings was to review film damaged by the Studio Contractor and determine what steps could be taken to correct the matter. It was determined that the Studio Contractor was damaging the film through over-processing and less- than-careful handling. However, due to legal difficulties involved, it appears that we must continue with the present Contractor. The Contract Administrator has ordered replacement of damaged film and incorrect film stock in accordance with terms of the Contract.

Television and shooting scripts and other proposed "TV-Featurettes" were supplied the Public Relations Services Division in Schenectady in reply to their inquiry on possible subject material at Hanford.

The TV-Featurette, "The Man With Four Hands," a story on remote handling equipment at Hanford, reached final shooting stages during the month.

Shooting script and scheduling on the TV-featurette, "Through the Looking Glass," were finished and initial photography scheduled for November 11.

Four editions of Hanford Science Forum were recorded this month. A complete publicity plan is underway which will keep listeners informed about future broadcasts of Hanford Science Forum and "Inside Hanford," radio programs. GE NEWS, news releases, posters and correspondence directed to community leaders in the Tri-City Area will be utilized to effect full coverage of these public service features.

At the request of the AEC, the entire auction held October 11 and 12, was tape recorded. Portions of the tape recording also were used in the "Inside Hanford" radio program. It was reported that several disputes between the Government, and buyers have been settled by the simple expedient of playing back the applicable portions of the recording.

Graphics' October assignments were distributed as follows:

General Administrative	8%
Employee and Public Relations	12
Engineering	31
Manufacturing	12
Financial	9
Radiological Sciences	10
Plant Auxiliary Operations	9
Atomic Energy Commission	9
	100%

Employee and Public Relations

	September	October
Total assignments completed	47	55
Total assignments backlog	67	52

Technical illustration work on the 100-C Examination Facility Equipment drawings for the month included perspective projection and development of the slug viewer, surface camera, slug weigher and stereo microscope. In addition to the above, air brush renderings were completed of the slug weasel, slug decapper, slug measurer, fracture camera, dolly, cartridge crane, cartridge loader, slug cleaner, fracturer and packager. Work has started in preparation of a perspective of the four examination basins showing equipment locations.

Visual aids prepared for the Purex and 105-K Project Review included detailed cut-away perspective drawings of the condensor-concentrator, sampler, liquid-liquid centrifuge and ventilation system. Other aids prepared consisted of flow diagrams, design and manpower schedule charts, progress and cost charts and a cross section of the 202-A Building.

Drawings, flow diagrams and charts were prepared for a "Power Reactor Study" report, for a report on production and cost performance to the AEC, Washington, D.C., and for a biology lecture to be given in Japan by a representative of the AEC.

An estimate of cost for the preparation of the "1954 at Hanford" report was prepared and submitted to a representative of Advance Engineering. Preliminary work has started on format design, typography and general art layout.

Graphics Statistical Summary

	Charts or Graphs	Illustrations	Lecture Aids	Other
Report Material (includes Technical publications)	114	30		4
Special technical illustrations Purex and 100-C Examination Facilities - Equipment		17		
Miscellaneous graphs and organization charts	12			
Lecture material - Purex and 100-K			28	
Project review - slide presentation			6	
Posters and embossograph signs				105
General - Posting of current data, inking, assembly, etc. of HAPO cost charts, employment statistics, SF material control charts, etc.	44			
	170	47	34	109

Total plates completed - 360.

Employee and Public Relations

A total of 282 photographic assignments were completed this month, and 11,720 prints were produced of which 6,914 were "A" and "B" employee identification photographs. A total of 4,806 were area and news work.

Motion picture film exposed for the month was: 2,400 feet, 16mm (b&w) film for 100-K; 700 feet, 16mm (b&w) film for Purex; 1,000 feet, 16mm (b&w) film for Employee Communications and Public Relations Section.

An increase of 24% in requests for Photography at Hanford is noted for October, 1954, over October, 1953. In the same period an increase of negatives exposed amounts to 217%. The increase in prints and slides has been in proportion to these increases.

The 300 Area Photography Laboratory this month used the prototype model of a slit camera, constructed by the Instrument Unit for Fuel Technology, marking the first practical application of this camera. The interest shown at this point indicates that it will be used by other sections for various inspection uses. The Laboratory also has processed and printed a new material called metalphoto, which is used to make disc-type calculators for the Metal Preparation Section.

One photographic request, by the Design Section required 167 negatives, and 948 prints on reactor area modification. Three weeks were required to complete this request.

See attached Statistical Report for Photography Unit.

PHOTOGRAPHY UNIT MONTHLY REPORT OCTOBER, 1954	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	[illegible] X [illegible] G.	35mm Color Slides	3¼" X 4" (B&W) Slides	3¼" X 4" Color Slides	4" X 5" Color Transp.	16mm M.P. Film
EMPLOYEE & PUBLIC RELATIONS												
COMMUNITY OPERATIONS												
Library					3		2					
Police Unit			399	8	58		158					
Fire Unit			294	127	44		340					
Education & Training			10		3		8					
EMPLOYEE COMMUNICATIONS & PUBLIC RELATIONS											17	
Public Communications		20	2	28	67		11					
News Bureau		215	8	75	434		113					
G. E. News		46			119		156					
Audio Visual			6	12	29	30	30					3,400 ft.
Special Programs		6		20	6		27					
HEALTH & SAFETY				4	27		6				14	
Hospital Administra.								2				
Public Health				2	5		2		1			
PERSONNEL PRACTICES					4		4					
Employment	890						178					
ENGINEERING												
DESIGN				11	12	1,264	268	9				
Drafting						48						
Processing						26	19					
ADVANCE ENGINEERING							8		8			
PROJECT ENGINEERING			6			123	64					
TECHNICAL												
Applied Research			2		130	156	185		66			
Fuel Technology			50		36	240	119		1	36		
Pile Technology					28	46	46		31			
Separations Technology						9	3					
FINANCIAL												
Property Accounting					6	8	18					

PHOTOGRAPHY UNIT
MONTHLY REPORT
OCTOBER, 1954

	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	NEG.	35mm Color Slides	3¼" X 4" (B&W) Slides	3¼" X 4" Color Slides	4" X 5" Color Transp.	16mm M.P. Film
MANUFACTURING												
MANUFACTURING ADMIN.					18		6					
PLANT ENGINEERING						40	17					
REACTOR		23			2	14	15			16		
SEPARATIONS	198					20	35					
METAL PREPARATION						42	11					
PLANT AUXILIARY OPERATIONS												
SECURITY & PATROL	2,151	3,150			2		30					
Transportation					6		3					
RADIOLOGICAL SCIENCES												
BIOLOGY			135						7			
BIOPHYSICS			6		18	60	10					
RADIOLOGICAL ENGR.												
RADIO. RECORDS & STAND.						64	10					
A.E.C. SAFETY			24	10	10		45				6	
A.E.C. SECURITY	525						96					
TOTALS	3,764	3,437	965	297	1,067	2,190	2,043	11	117	55	37	3,400 ft.

	AUGUST	SEPTEMBER	OCTOBER
TOTAL ASSIGNMENTS	257	319	282
TOTAL NEGATIVES	1,498	1,646	2,043
TOTAL PRINTS	11,980	10,576	11,720

Employee and Public Relations

UNION RELATIONS

Union Relations - Operations Personnel

The official certification of the Hanford Atomic Metal Trades Council as the collective bargaining representative of 16 Material Expediters and Take-Off Men in the Manufacturing Department was received from the National Labor Relations Board on October 14. Unofficially, we hear that the group will affiliate with the Technical Engineers and will be issued a charter by the A.F.L. We have received no request for a meeting with the Company to discuss wages or conditions.

An understanding was reached with the Hanford Guards Union on October 15 which resolved all problems associated with a demand for the Company to arbitrate a provision of an on-the-job working procedure which had been signed by the Union and Patrol supervision. The primary accomplishment in the settlement consisted of a definitive statement regarding the status of working procedures that are formulated for use in various work locations. Our position in this regard is now firmly established with both the HGU and HAMTC.

In January, 1953, in anticipation of an early incorporation of Richland, we entered into an agreement with the HAMTC providing for an orderly transition of nonexempt people from the Community into other operating components. It was designed to eliminate the problem of mass "bumping" at such time as the Community was eliminated as a GE responsibility. In view of the fact that the agreement had accomplished the transfer of as many people out of Community as would voluntarily accept such transfers, the agreement was officially terminated on October 5. Continued efforts will be made, however, to move long service employees from Community to operating jobs as openings develop.

Letters were received from each of the HAPO collective bargaining units accepting our proposed revision in the Pension Plan resulting from a recent change in the Social Security Law.

A new classification, Chief Control Operator (Power), Grade 23, has been negotiated for use in the 100-K Area.

Grievance Statistics:

A total of twenty-six (26) 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	23	1	1	25	1
Received this year	258	44	2	304	26
Step I					
Pending September 30	7	0	0	7	0
Settled this month*	15	0	0	15	0
Settled this year	162	14	1	177	22
Pending October 31	5	0	0	5	0

Employee and Public Relations

UNION RELATIONS

ALL DEPARTMENTS (Cont'd.)

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Step II					
Pending September 30	17	0	0	17	0
Settled this month**	11	2	0	13	1
Settled this year	83	32	0	115	6
Pending October 31	11	1	1	13	0
Arbitration					
Pending September 30	4	1	0	5	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending October 31	3	1	0	4	

BY DEPARTMENTS

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Manufacturing						
Reactor - Unit	5	109	8	69	5	37
Nonunit	0	5	0	4	0	0
Separations - Unit	7	61	2	39	4	18
Nonunit	0	4	0	2	0	1
Metal Preparation - Unit	5	29	1	18	1	6
Plant Auxiliary Operations						
Transportation - Unit	3	20	2	11	1	9
Plant Protection - Unit	2	56	1	23	2	34
Nonunit	1	2	0	1	1	1
Stores - Unit	2	4	0	2	0	2
Electrical Distribution - Unit	0	1	0	0	0	1
Telephone - Unit	0	3	0	2	0	1
Nonunit	0	1	0	0	0	1
Employee and Public Relations						
Community - Unit	0	11	0	6	0	2
Hospital - Unit	1	2	0	1	0	0
Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	0	8	0	7	0	1
Nonunit	0	4	0	3	0	0
Engineering - Nonunit	0	5	0	7	0	2
Financial - Nonunit	0	3	0	2	0	1

*Grievances brought to Step II prior to August 1, 1954, 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 August 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

BY SUBJECTS

	Manufacturing		Plant Aux. Operations		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	This Mo.	This Year
Unit												
Discrimination	2	2	0	1	0	1	0	0				
Jurisdiction	8	86	3	23	0	5	0	4				
Health-Safety-San.	1	11	0	3	0	2	0	0				
Hours of Work	1	8	0	29	1	1	0	0				
Overtime Rates	3	21	0	4	0	0	0	0				
Holidays	0	3	0	2	0	0	0	0				
Sick Leave	0	6	0	0	0	1	0	0				
Seniority	0	16	1	6	0	0	0	1				
Grievance Procedure	0	3	0	0	0	0	0	0				
Wage Rates	2	23	1	7	0	2	0	1				
Miscellaneous	0	21	2	8	0	1	0	1				
Nonunit												
Health-Safety-San.	0	0	0	0	0	0	0	0	0	1	0	0
Overtime Rates	0	4	0	1	0	0	0	2	0	0	0	0
Vacation	0	0	0	0	0	0	0	1	0	0	0	0
Seniority	0	1	0	0	0	0	0	0	0	0	0	0
Cont. of Service	0	1	0	1	0	1	0	0	0	0	0	0
Leave of Absence	0	1	0	0	0	0	0	0	0	0	0	0
Wage Rates	0	1	0	1	0	0	0	1	0	3	0	1
Work Assignment	0	1	0	0	0	0	0	0	0	0	0	2
Miscellaneous	0	0	1	1	0	0	0	0	0	1	0	0

Organization changes made during the month of October are not reflected in this report. Changes will be reflected in November statistics, as effective November 1, 1954.

Construction Liaison

For some time we have anticipated that as the construction program tapered off the Building Trades crafts would look more critically at work assignments as they are affected by the Davis-Bacon Act. During the latter part of the month, we have had several discussions concerning this subject with Building Trades representatives and it is probably safe to assume that there will be more. Our position on Davis-Bacon is good and I believe entirely defensible, but it is important to recognize that the next few months will be particularly sensitive ones insofar as the Davis-Bacon problem is concerned.

No further protests have been received from the Millwrights concerning the temporary machining being performed by Machinists in the 2101 Building.

Employee & Public Relations

SALARY ADMINISTRATION

1. A limited salary survey was conducted with eight firms located in California. Six of these firms are engaged in architect-engineering work, while the other two represent the petroleum industry. Salary information was obtained on a total of 21 positions; about one-half of these positions have been reconciled elsewhere in the Company while the balance represents positions which are either peculiar to HAPO or else have not been reconciled as yet within the Company. Actually, the purpose of the survey was twofold: to obtain confirmatory information, on a regional basis, relative to a few Representative Positions; and to seek information in connection with other positions. The data obtained is being analyzed.

   It is noteworthy that the majority of the firms contacted expressed opinions that they were more enthusiastic toward participating in the type of survey being conducted this year than in past surveys. This is mainly due to the fact that it relieves them of a considerable burden of work in compiling masses of salary data. Also, they feel that salary range information, as related to comparable positions, is more apt to result in the establishment of realistic controls than data derived from the salaries actually being paid to the incumbents of comparable positions.

2. A review of Position Guides, titles, and evaluations was completed for the Manufacturing, Engineering, Radiological Sciences and Employee and Public Relations Departments.

3. Addition of accountability and authority factors to all supervisory Position Guides was completed.

4. Re-evaluation work in connection with the reorganization of the Financial Department and the distribution of the Plant Auxiliary Operations Department was completed.

5. The Salary Administration Manual was revised, reprinted and distributed.

6. Position Relationship Data Sheets were brought up to date.

7. Authority was received to adopt the new Company Salary Plan.

8. A new Exempt Employee Appraisal Plan was completed.

9. The regular quarterly report for the period ending September 30 was prepared and distributed.

10. Considerable progress on the proposed job evaluations plan for non-exempt employees was made following the first sectional meeting, at which preliminary plans were outlined. Jobs were segregated in related groups. Supervisors were contacted and the first draft of some of the plans was completed.

11. A reimbursement authorization request was submitted to the AEC to cover a modification in the compensation of Community Firemen in accordance with the September 16, 1954, agreement between HAPO and the HAMTC.

12. The following reimbursement authorizations were received from the AEC during the month:

No. 232 to establish four new classifications entitled "Accountability A, B, C, and D".

No. 233 for the establishment of a new classification entitled "Chief Control Operator (Power)".

No. 234 to cancel the classification of Engineering Assistant, Grade 19, and to establish a new classification entitled "Engineering Assistant, Grade 20".

Employee and Public Relations
EDUCATION AND TRAINING SECTION

The report of the Education and Training Section is submitted as follows:

ROTATIONAL TRAINING PROGRAM

Present Assignments

Department	Last Month	This Month
Engineering		
Technical	18	16
Design	7	6
Project	5	6
Manufacturing		
Metal Preparation	0	0
Separations	2	3
Reactor	6	4
Radiological Sciences		
Biology	1	1
Records & Standards	1	1
Bio-Physics	1	1
Financial		
Procedures & Computing	1	1
TOTAL	42	39

Permanent Placements

There were three placements off the program (all with Reactor Section) during the month. This compares to five placements during September, and it is anticipated that the tempo of placements off the program will increase in the ensuing months to fulfill requirements of the various sections.

Selective Service

Three technically trained men were lost to selective service making a total of 36 since September, 1953, when the first loss occurred.

Letters were written to all the men in the Armed Forces telling them of arrangements made to send the "G.E. Review" and the "Works News" to them while in the service. It is planned to maintain correspondence with all of the men in service in an effort to maintain their interest in the General Electric Company and also to obtain their assistance in referring qualified engineers to us who are being released from service in the ensuing months.

ROTATIONAL TRAINING PROGRAM (Continued)

Summer Program

Letters have been received from several of the ten juniors on last summer's program expressing appreciation of the training and direction received on their three months assignment.

SCHOOL OF NUCLEAR ENGINEERING

Fall Semester

During the month students have been paying the balance of their tuition. At the close of business on October 11, 1954 (our deadline on tuition payments) 237 persons had paid the full tuition with 70 not paid. An intensive follow-up now brings our Fall 1954 enrollment to the following figures with all but four people fully paid up and these have assured the school that they plan to continue their courses and pay the tuition balance.

Differential Equations	22
Advanced Calculus	12
Math Statistics I	14
Modern Physics I	18
Nuclear Physics I	6
Theoretical Physics I	6
Physical Chemistry I	8
Radiochemistry	9
Fluid Mechanics	10
Diffusional Processes I	5
Elec. Transmission Probs. I	8
Mechanical Vibrations	5
Adv. Physical Metallurgy	5
Engineering Metallurgy I	5
	133

Differential Calculus	15
Intermediate Algebra	15
College Algebra	19
Automatic Control	19
Instrument Electronics	23
El. Accounting I	27
Business Law I	18
Cost Accounting	6
	142

SCHOOL OF NUCLEAR ENGINEERING (Continued)

Compared to last Fall's total paid registration, this year's enrollment is larger almost entirely in the college-level subjects.

	Fall 1953	Fall 1954	Increase
Graduate	129	133	3%
College-level	100	142	42%
	229	275	20%

Student Affiliations

All of the students who were undecided about where to register a course have been contacted and the problem of selection has generally been reduced to a choice of one or two schools. Lists of students desiring to affiliate with the various schools have been sent to each Graduate Dean to aid him in planning his Richland visit. For the current semester the affiliation may be broken down as follows:

School	New	Old	Total
University of Idaho	35	40	75
Oregon State College	11	15	26
Washington State College	8	3	11
University of Washington	4	6	10
	58	64	122

Letters have been sent to all graduate students who did not ask for college credit pointing out the advantages of current registration if they care to do so.

Visits

Glenn Jones, head of the General Extension Service at the State College of Washington, visited on October 5 to discuss plans for college-level subjects to be offered in the Tri-City area in the Spring 1955 term. Mr. Mayer and Mr. McLenegan asked for more time to fully evaluate and determine what interest there is in continued undergraduate studies before a definite decision is reached on specific courses. Generally, the School of Nuclear Engineering would like to continue offering many of these subjects that are of interest to many project employees.

The following representatives from the University of Idaho visited Richland October 28 and 29 to register the interested students:

Dr. L. C. Cady, Dean of the Graduate School
Dr. W. H. Cone, Professor of Chemistry
Dr. M. L. Jackson, Professor of Chemical Engineering
Mr. H. E. Slade, Accountant in Business Office

SCHOOL OF NUCLEAR ENGINEERING (Continued)

Special Developments

The School of Nuclear Engineering is continuing to offer more courses in electrical engineering and metallurgy. This has prompted some electrical engineers to inquire about an M.S. in that field. Some tentative ideas are in the discussion stage with the affiliated schools.

Of greater interest is the tentative formulation of a graduate program leading to the Master's degree in Nuclear Engineering and its acceptance by one of the affiliated colleges. More graduate schools have realized that such a degree is feasible provided the individual takes some basic required courses and also some in the field of his undergraduate degree.

TRAINING

Exempt Orientation was presented Monday, October 4, with an attendance of 25 new non-supervisory personnel. This program covers Company organization, sources of information, salary plan, labor laws, and human relations in industry. The Rotational Training Representative, Employee and Public Relations Department, was guest speaker at a luncheon for the group at the Desert Inn.

Principles and Methods of Supervision meetings were held for Group #75 during weeks of October 11-22, with 12 supervisors completing the course.

Accident Prevention Program was presented Wednesday, October 13, with an attendance of 30 supervisors of 200-West Area. This four-hour meeting gives supervisors an opportunity to discuss the problems of accident prevention and how they, as supervisors, can develop their employees' awareness of the desirability of performing their jobs safely.

HOBSO II was presented October 13, 19, and 27, with 23 supervisors attending. These discussion meetings cover the effects of the war-time economy, government control, and post-war economy.

Conference Leading was conducted October 18 and 25, with 13 supervisors participating. This program is directed toward stimulating interest in learning the techniques of leading group discussions.

Effective Human Relations conference No. 1 was held for Group #23 on October 20, with an attendance of 14 supervisors. This 12-hour program of three conferences deals primarily with actual human relations case studies. These cases are presented through various films, records, and other on-the-job cases of the supervisors attending.

TRAINING (Continued)

Labor Management Relations was presented October 28, with an attendance of 10 supervisors. This program is a clause-by-clause discussion of the HAMTC and other local agreements with the Company.

All Training Representatives spent a considerable part of the first two weeks of the month preparing outlines of current training programs assigned to them.

At the request of supervision of Reproduction Unit, Engineering Department, a member of Training showed the film "The Atom Goes to Sea" to 56 Reproduction Unit personnel.

A member of Training gave a talk on "Why of Human Relations" to 51 members of Richland Rotary Club at a luncheon Tuesday, October 12 in the Desert Inn, and on Thursday evening, October 28 the talk was given to 45 members of the Richland Education Association at Marcus Whitman School.

The Manager of Education and Training Section met Wednesday, October 13 with Training Unit representatives and two engineering analysts of Separations Section, Manufacturing Department, for discussion of JMT and Work Simplification programs.

Two members of Training attended a meeting of the Pacific Northwest Personnel Management Association in Vancouver, B.C. on October 21-23.

Our attendance records have been carefully analyzed to determine the extent to which exempt members of the Manufacturing Department have attended our training programs versus those who should still attend. A similar study is underway in relation to the Engineering Department. This survey will provide a background for planning our future training programs to fit the needs of exempt personnel in these and other departments, as we are able to complete the survey.

During the month the following requests for information were answered:

Reports on Training Program Attendance ----- 134
Guide sheets for "Lets Talk It Over" interviews ----- 112
Business English Reference Sources ----- 16

Supervisor's Handbook Records:

Number issued during October ------ 2
Number returned during October ---- 6
On Hand end of October ---------- 197

Of the 197 handbooks on hand 66 are not usable because of missing pages, 21 have yet to be checked for completeness and 110 are ready for issuance.

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
OCTOBER 1954

General

Personnel Changes

Ten additions and eleven deletions resulted in a decrease of one to 257.

Employee Relations

Employee attendance at 32 meetings was 227.

Visits

Mr. Bakko attended a meeting of the Board of Trustees of the Washington State Hospital Association in Seattle. He was recently elected 2nd Vice-President of this association.

Industrial Medicine

Our Demurrer in the Riste case (claimed neglect in discovery of tuberculosis in annual chest x-ray) was sustained by the judge of the county superior court on basis of statute of limitation.

A thirty minute interview of new supervisors by the managers of Safety and of Industrial Medicine for purpose of orientation in the field of accident prevention and absentee reduction is felt to be most worthwhile.

Medical examinations changed slightly from 999 to 988 while dispensary treatments decreased from 4720 to 4551.

Sickness absenteeism was 1.58% as compared with 1.31% for September while total absenteeism was 2.42% as compared with 2.05% for September.

The health topic of the month was "Aging."

Safety and Fire Prevention

Injury Statistics

	Minor			Sub-Major			Major		
	Sept.	Oct.	To Date	Sept.	Oct.	To Date	Sept.	Oct.	To Date
Plant	272	257	2953	0	0	17	1	0	4
Community	22	16	219	0	0	0	0	0	1
Plant and Community 1954	294	273	3172	0	0	17	1	0	5
Plant and Community 1953			3305			15			12

Since total injury rate is the best index of success in injury prevention, it is gratifying that the rate for October for the plant was 1.85, the lowest which we have attained. The community rate of 1.59 is also excellent.

Kadlec Hospital

The average daily census increased from 61 to 68.6 as compared with 81.3 a year ago.

The occupancy percentage for the mixed services was 63.1.

Public Health

A big increase in communicable disease was due largely to a continued rise in the incidence of chickenpox and an outbreak of ringworm. About two-thirds of the 273 interviews by social service counselors were concerned with parent-child and marital problems.

HEALTH & SAFETY SECTION

OCTOBER 1954

General

Public Health (Continued)

Regular inspections of eighteen food handling establishments indicate a need for improvement. Another series of food handling training programs will be suggested to try to improve standards.

Costs-September

	Aug.	Sept.	Sept. Budget
Industrial Medicine	$46,640	$43,867	$47,530
Public Health (Oper.)	10,740	11,569	12,392
Kadlec Hospital (Net)	33,588	26,886	24,000
Hospital Expense Credits	2,825	996	2,000
Safety & Fire Prevention	18,821	16,982	20,916
Subtotal-Health & Safety (Oper.)	112,614	100,300	106,838
Construction Medical (Industrial & Public Health)	1,040	593	1,143
Total-Operations & Construction	$113,654	$100,893	$107,981

The net cost of operating the Health and Safety Section before charges were assessed to various departments was $100,893, about $13,000 less than the August costs and about $7,000 below the budget. Major problem in control of hospital net costs - the major fluctuating item - is the unpredictable patient census which is continuing to be much lower than expected.

HEALTH & SAFETY SECTION

OCTOBER 1954

Industrial Medical Services

The total number of examinations decreased from 999 to 988. General Electric employees sustained no major injuries and no sub-majors. Contractor employees sustained one sub-major injury. Dispensary treatments decreased from 4720 to 4551. There were 26 nurses on the non-exempt roll, an increase of one in preparation for establishing services in the 100-K Area. The 700 Area station had 272 visits during the month.

One information meeting was held during the month for industrial physicians. A scientific meeting was also held for industrial physicians, and papers heard at the Houston and Portland meetings on Industrial Medicine were reviewed by Doctors Norwood and Nesbitt.

Our Demurrer was sustained by Judge Horrigan in Franklin County Superior Court in the two pending suits regarding notification of employees of the results of x-ray examinations.

The interviewing of new supervisors in regard to the personal aspects of accidents appears to be a worthwhile objective and will be continued. The new supervisor is briefed on the part inter-personal relationships play in accident control, identification of problem cases and services which are available for help.

The supervision of 26 nurses in 10 different locations continues to be a problem. It has not been possible to hold group meetings during or outside of working hours. Since these nurses are visited between 4500 and 5000 times per month by HAPO employees it is desired to improve and implement relations between nurses and employees, especially in regard to accident and absenteeism control practices.

The Health Activities Committee met on October 21st. The health topic on aging was discussed and material on this subject prepared for distribution throughout the plant. Ways and means of giving more recognition to employees with perfect attendance records were also discussed. A plantwide health slogan cotest for all employees was prepared and will be carried out during the coming month. The objective is to stimulate interest in personal health in employees.

Net expenses for the month of September amounted to approximately $35,000, a decrease of $3,000 from the previous month. The major portion of the decrease was attributable to the inclusion in August of $2,000 in moving expenses for two physicians who were brought to Richland. A further decrease of $800 occurred in the salary category due to there being a reduction of two nurses during September.

Costs-Operations

	Sept.	Aug.	Increase (Decrease)
Salaries	$33,726	$34,505	$ (779)
Continuity of Service	3,035	3,105	(70)
Laundry	284	331	(47)
Utilities, Transportation, Maintenance	3,672	3,489	183
Supplies and Other	4,211	6,320	(2,109)
Total Gross Costs	44,928	47,750	(2,822)
Less: Revenue	1,061	1,110	(49)
Expense Credits	8,468	8,637	(169)
Net Cost of Operation	$35,399	$38,003	$(2,604)

Industrial Medical Services (Continued)

Costs-Operation (Continued)

At the end of the first quarter's operation, net expenses are nearly $13,000 or 11% less than budgeted. Salaries and related continuity of service expense account for $3,000 of the underrun due to there being one less employee on the roll than included in the budget. Continuity of service expense is currently computed at 9% of salaries whereas provision was made in the budget for a rate of 10½%. Lower than estimated maintenance expenses and greater than estimated charges to other departments for services rendered account for the balance of the underrun.

HEALTH & SAFETY SECTION

OCTOBER 1954

Industrial Medical Services (Continued)	September	October	Year to Date
Physical Examinations			
Operations			
Pre-employment	77	90	879
Rehire	18	23	252
Annual	192	293	2560
Interim	236	190	1646
A.E.C.	27	30	314
Re-examination and recheck	183	218	2041
Termination	130	67	829
Sub-total	863	911	8521
Contractors			
Annual	36	19	162
Pre-employment	6	12	540
Recheck	11	4	269
Termination and Transfer	83	42	292
Sub-total	136	77	1263
Total Physical Examinations	999	988	9784
Laboratory Examinations			
Clinical Laboratory			
Government	139	130	1362
Pre-employment, Termination, Transfer	1904	1400	16070
Annual	1063	1621	14016
Recheck (Area)	1218	1027	8113
First Aid	0	2	67
Clinic	327	402	3710
Hospital	3961	3964	42086
Public Health	0	0	3
Total	8612	8546	85427
X-Ray			
Government	16	23	170
Pre-employment, Termination, Transfer	148	157	2034
Annual	473	511	4618
First Aid	82	54	814
Clinic	280	183	2125
Hospital	223	261	2822
Public Health	3	19	101
Total	1225	1208	12684
Electrocardiographs			
Industrial	57	92	718
Clinic	2	1	12
Hospital	27	29	318
Total	86	122	1048

HEALTH & SAFETY SECTION

OCTOBER 1954

Industrial Medical Services (Continued)	September	October	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	367	310	3994
Occupational Case Retreatments	1371	1227	13076
Non-occupational Treatments	2525	2681	25384
Sub-total	4263	4218	42454
Construction			
New Occupational Cases	90	58	726
Occupational Case Retreatments	290	216	2114
Non-occupational Treatments	77	59	591
Sub-total	457	333	3431
Facility Operators	0	0	149
Total First Aid Treatments	4720	4551	46034
Major Injuries			
General Electric	1	0	5
Contractors	0	0	0
Total	1	0	5
Sub-Major Injuries			
General Electric	0	0	17
Contractors	1	1	4
Total	1	1	21
Absenteeism Investigation			
Calls Made	1	4	38
Employee Personal Illness	1	4	30
No. absent due to illness in family	0	0	1
No. not at home when call was made	0	0	7

HEALTH & SAFETY SECTION

OCTOBER 1954

Kadlec Hospital

The average daily adult census increased from 61.0 to 68.6, as compared with 81.3 a year ago. This represents an occupancy of 62.9 percent, broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 63.1; Obstetrical Service 62.3. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	37	70
Obstetrical Service	8	17
Total Adult	52	86

The average daily newborn census increased from 12.1 to 13.0 as compared to 13.1 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.65
Obstetrical	4.00
Newborn	2.78

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of September was 2.52. When newborn infants are included, the ratio is 2.16.

The net expense for the operation of Kadlec Hospital for September was $26,886 as compared to $33,588 for August. Summary is as follows:

Kadlec Hospital net expense $26,886
This represents a decrease of approximately $6,700. It results from a decrease in gross costs of $3,600, an increase in revenue of $4,900 and a decrease in expense credits of $1,800.

Mr. O. E. Bakko attended a meeting of the Board of Trustees of the Washington State Hospital Association in Seattle.

The patient census continues to be lower than our experience over the past three years. As a result, in our mid-year budget review we have re-appraised our estimated expenses and income.

The following is a summary of employee relations meetings held in the Health and Safety Section during October.

	Meetings	Attendance
Hospital	22	147
Industrial Medicine	2	10
Public Health	5	45
Safety & Fire Prevention	1	13
General	2	12
	32	227

HEALTH & SAFETY SECTION

OCTOBER 1954

Hospital Unit (Continued)	September	October	Year to Date
Kadlec Hospital			
Average Daily Adult Census	61.0	68.6	72.1
Medical	15.2	20.7	20.1
Surgical	25.9	25.3	28.9
Pediatrics	6.1	9.5	10.7
Mixed	47.2	55.5	59.7
Obstetrical	13.8	13.1	12.4
Average Daily Newborn Census	12.1	13.0	11.8
Maximum Daily Census:			
Mixed Services	62	70	99
Obstetrical	20	17	21
Total Adult Census	75	86	116
Minimum Daily Census:			
Mixed Services	20	37	20
Obstetrical Service	8	8	4
Total Adult Census	28	52	28
Admissions: Adults	491	531	5362
Discharges: Adults	491	538	5367
Medical	138	152	1411
Surgical	191	210	2214
Pediatrics	58	76	823
Mixed	387	438	4448
Obstetrical	104	100	919
Newborn	91	82	817
Patient Days: Adult	1830	2127	21908
Medical	456	641	6102
Surgical	778	784	8784
Pediatrics	182	296	3264
Mixed	1416	1721	18150
Obstetrical	414	406	3758
Newborn	364	402	3588
Average Length of Stay: Adults	3.7	4.0	4.1
Medical	3.3	4.2	4.3
Surgical	4.1	3.7	4.0
Pediatrics	3.1	3.9	4.0
Mixed	3.7	3.9	4.1
Obstetrical	4.0	4.1	4.1
Newborn	4.0	4.9	4.4
Occupancy Percentage: Adults	56.0	62.9	66.1
Medical	41.1	55.9	54.3
Surgical	80.9	79.1	90.3
Pediatrics	32.1	50.0	56.3
Mixed	53.6	63.1	67.8
Obstetrical	65.7	62.3	59.0
Newborn	46.5	50.0	45.4

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

HEALTH & SAFETY SECTION

OCTOBER 1954

Hospital Unit (Continued)	September	October	Year to Date
Kadlec Hospital (Continued)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	4.31	3.65	
Obstetrics	3.26	4.00	
Newborn	2.97	2.78	
Avg. No. Employees per Patient (excluding newborn)	2.52		
Operations: Major	69	66	754
Minor	67	83	857
E.E.N.T.	47	45	584
Dental	1	0	11
Births: Live	90	84	818
Still	0	1	7
Deaths	4	4	45
Hospital Net Death Rate	.69%	.16%	.36%
Net Autopsy Rate	75.0	50.0	48.9
Discharged against advice	5	3	22
One Day Cases	147	161	1512
Admission Sources:			
Richland	68.8	72.1	72.1
North Richland	13.7	12.4	12.5
Other	17.5	12.5	15.4
Admissions by Employment:			
General Electric	65.2	69.2	67.8
Government	3.7	3.0	3.2
Facility	5.3	4.7	5.3
Contractors	20.2	16.9	18.0
Schools	.8	1.5	1.3
Others	4.8	4.7	4.4
Hospital Outpatients-F.A.	610	623	5654
Recovery Bed Patients-F.A.	0	0	71
Physical Therapy Treatments			
Clinic	217	258	2934
Hospital	76	53	832
Industrial: Plant	258	269	2014
Total	551	580	5780
Pharmacy			
No. of Prescriptions Filled	2666	2714	46456
No. of Store Orders Filled	453	588	5256

HEALTH & SAFETY SECTION

OCTOBER 1954

Hospital Unit (Continued)	September	October	Year to Date
Kadlec Hospital (Continued)			
Patient Meals			
Regulars	3115	3140	34110
Children under 8	256	407	3870
Specials	903	1239	11289
Softs	497	716	7726
Tonsils	59	89	1038
Liquids	160	182	1658
Surgical Liquids	96	128	1020
Total	5086	5901	60711
Cafeteria Meals			
Noon	1648	1655	17857
Night	335	321	3277
Total	1983	1976	21134

HEALTH & SAFETY SECTION

OCTOBER 1954

Public Health Unit

The sharp increase in communicable diseases reported is due chiefly to a continued rise in the incidence of chickenpox and an outbreak of ringworm. This latter incident is centralized chiefly around Marcus Whitman school. The infection is the body type. Constant surveillance through daily inspection has revealed those infected. Subsequent treatment by the family physician is bringing the spread of this disease under control.

The number of home visits made by the public health nurses increased by approximately 13% due to the rise in morbidity and followup in preparing for crippled children and tuberculosis clinics.

A conference was held with the Director of the Handicapped Program, Richland Schools, relative to medical supervision of handicapped children in the Special Service Unit.

Two meetings were held with the new teachers in the Richland School District to orient them with the activities and functions of the Public Health Unit.

Of the 273 contacts made by the social service counselors, 92 (34%) were concerned with problems of relationship between parents and their children. There were 84 (31%) consultations focused on marital difficulties. Direct help with personal problems was given in 63 (23%) interviews with children and adolescents and 14 (5%) interviews with adults. Problems arising from physical and mental illness were handled in 15 (6%) interviews. Economic and vocational problems were the focus of 3 (1%) requests for assistance.

Eighteen food handling establishments received their regular monthly inspection. Results indicate improvement is needed on food handling practices. It is felt that another series of food handling training programs would help correct this.

One drive-in restaurant was approved for operation after meeting county standards. School cafeterias were also inspected and results were satisfactory with the exception of adequate cleaning of dishwashing machines. Techniques of dismantling of wash arms and cleaning of dishwashing machines were demonstrated and should correct this situation.

Bakeries were inspected and found to be satisfactory. They were granted approval to deliver cream pies to restaurants with refrigerated pie cases during the winter months.

Thirty-three Grade A dairy farms were inspected. Two producers were degraded as a result of continued high bacteria counts. Results of bacteriological examination of 17 pasteurized milk samples were acceptable. Coliform test was negative in all samples and bacteria counts were below 3,000.

Sterilization process of water lines in the new transportation terminal was supervised by this section and water samples collected were negative for coliform bacteria.

Public Health Unit (Continued)

Thirteen rabies investigations were made and resulted in the impoundment of one stray dog. Others were allowed to remain at owner's residence during observation period.

Carpet beetles continue to be a problem and were found to be present in seven homes. Information relative to control measures was given.

HEALTH & SAFETY SECTION

OCTOBER 1954

Public Health (Continued)	September	October	Year to Date
Education			
Pamphlets distributed	10,990	6,024	116,205
News Releases	32	30	155
Staff Meetings	0	2	12
Classes	6	4	136
Attendance	25	64	3,162
Lectures & Talks	3	8	53
Attendance	66	133	2,229
Films Shown	1	8	100
Attendance	6	220	3,711
Community Conferences & Meetings	30	43	285
Radio Broadcasts	10	12	89
Immunizations			
Diphtheria	6	6	75
Diphtheria Booster	0	0	244
Diptusses Booster	0	0	2
Tetanus	6	6	76
Tetanus Booster	0	0	243
Pertussis	6	6	53
Pertussis Booster	0	0	242
Smallpox	0	6	186
Smallpox Revaccination	0	0	591
Tuberculin Test	0	3	22
Immune Globulin	8	1	794
Other	0	0	4
Social Service			
Cases carried over	96	101	945
Cases admitted	17	17	168
Cases closed	12	17	153
Remaining case load	101	101	960
Activities:			
Home Visits	2	6	70
Office Interviews	270	267	2,979
Conferences	40	40	450
Meetings	9	10	83
Sanitation			
Inspections made	160	113	1,370
Conferences held	8	12	150
Bacteriological Laboratory			
Treated Water Samples	185	209	2,021
Milk Samples (Inc.cream & ice cream)	30	32	352
Other bacteriological tests	402	532	5,447
Total	617	773	7,820

HEALTH & SAFETY SECTION

OCTOBER 1954

Public Health (Continued)	September	October	Year to Date
Communicable Diseases			
Chickenpox	14	53	357
German Measles	5	5	55
Gonorrhea	0	0	1
Impetigo	3	0	7
Influenza (U.R.I.)	0	0	4
Infectious Mononucleosis	0	0	1
Infectious Hepatitis	2	0	15
Measles	1	3	1,382
Meningitis	0	1	2
Mumps	2	3	41
Pinkeye	0	0	6
Poliomyelitis	2	0	4
Ringworm	2	27	35
Roseola	3	2	13
Scabies	0	0	1
Scarlet Fever	2	7	72
Streptococcal Infections-Throat	1	0	4
Syphilis	0	0	1
Tuberculosis	1	0	2
Whooping Cough	0	0	69
Total	38	101	2,072
Total No. Nursing Field Visits	459	528	6,205
Total No. Nursing Office Visits	33	59	873

COMMUNITY SECTION

OCTOBER 1954

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Community Administration	1	1	1	1
Maintenance & Renovation Unit	9	143	9	143
Police Unit	17	28	16	27
Commercial & Residential Property Unit	8	23	8	25
Fire Unit	67	0	66	0
Transfer Study	1	1	1	1
Community Operations Administration	1	1	1	1
Electrical Unit	5	16	5	16
Engineering Unit	7	4	7	4
Water & Sewerage Utilities Unit	4	21	5	17
Library Unit	4	9	4	9
Public Works & Recreation Unit	7	37	7	38
	131	284	130	282

	Exempt	Nonexempt
Additions to Payroll	0	6
Removals from Payroll	0	1
Transfers In	1	2
Transfers Out	3	8

Net Decrease 3

MAINTENANCE AND RENOVATION UNIT

	Exempt	Nonexempt
Employees - Beginning of the month	9	143
Transferred in	0	0
Transferred out	1	3
New hires	0	4
Terminations	0	0
Upgrade from nonexempt to exempt	1	1
Total employees - end of month	9	143

EXTERIOR PAINT REPORT - FY 1955

FOREMAN	PAINTERS	TRUCK DRIVERS	TOTAL
Chambliss	20	1	21
Lukins	19	1	20
Tappan	20	1	21
Total	59	3	62

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	264	75	198	66
B	188	52	166	22
D	3	0	0	3
E	24	1	18	6
F	68	14	58	10
G	4	0	0	4
H	95	15	90	5
L	40	14	35	5
Tract	16	7	10	6
Dormitories	23	0	0	23
Total:	725 (1177)	178	575	150

Est. MH B. F.	21,354	Actual MH B. F.	22,237
Est. MH This Mo.	10,132	Actual MH This Mo.	8,016
Total Est. MH	31,486	Total Actual MH	30,253

Total Season Estimate 43,612

INTERIOR PAINT REPORT - F.Y. 1955

FOREMAN	PAINTERS	TRUCK DRIVERS	TOTAL
Chambliss	20	1	21
Lukins	19	1	20
Tappan	20	1	21
Total	59	3	62

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	131	3	6	125
B	158	5	10	148
C	8	0	0	8
D	0			
E	23	0	0	23
F	52	1	1	51
G	0			
H	91	0	0	91
K	2	0	0	2
L	13	0	0	13
M	1	0	0	1
Q	3	0	1	2
R	1	0	0	1
S	1	0	0	1
T	0			
U	21	1	3	18
V	79	6	8	71
Y	96	2	4	92
Z	6	0	0	6
1BP	94	1	5	89
2BP	453	15	31	422
3BP	299	5	9	290
Tract	16	0	0	16
1BR Apt.	10	0	1	9
W-13 Apt.	2	0	0	2
2BR Apt.	0			
Total	1560	39	79	1481

36 Units added

Est. MH This Mo.	1735	Actual MH This Mo.	1983
Est. MH B. F.	1689	Actual MH B. F.	1716
Total Est. MH	3424	Total Actual MH	3699

PLUMBING SHOP

FOREMAN - F. L. ELSENSOHN

JOB DESCRIPTION	NO. COMPLETED
Electric water heaters replaced	13
Laundry tubs replaced	12
Shower stalls replaced	12
Plumbing work orders completed	36
Plumbing for floor and sink replacement	63
Cleared major sewer stoppages caused by tree roots	60

Made routine steam inspection once each week on Government owned commercial buildings, apartments and dormitories.

Excavated all sewer lines for cleaning out of roots, and backfilled. Also landscaped and seeded excavated portion.

SERVICE ORDER CREW

FOREMAN - L. F. CARPENTER

The following is a status report on service orders:

A.	On hand at the beginning of the month	175
B.	Received during the month	2091
C.	Completed during the month	1924
D.	On hand at the end of the month	342

E. A total of 303.6 hours were spent on work orders.

F. Backlog of service orders by craft:

Plumbing	254
Electrical	236
Carpentry	52
Total	342

RENOVATION AND LABOR CREW

FOREMAN - B. C. BAIN

The following services were performed during the month:

Vacant houses renovated	35
Vacant house interiors completely painted	2
Trash pickups	46 locations
Minor carpenter repairs to houses	43 houses
Minor carpenter repairs to dormitories	11 rooms
Dormitories sprayed for pest control	1
Dormitory rooms redecorated	0
Painted pump house exteriors	13
Painted interior fire damaged house	1

Provided weekly service of delivering linens and janitorial supplies to occupied dormitories.

MECHANICAL SHOP

FOREMAN - Z. H. MAYBERRY

The following services were completed during the month:

A. Millwright Crew:

Furnace service orders	308
Routine furnace inspections	170

All stokers and oil burners in the commercial facilities have been serviced and put in operation.

All thermostatically controlled unit heaters in Government owned commercial buildings have been checked and lubricated.

B. Sheetmetal Crew:

Replaced shower stalls	12
Repaired or replaced smoke pipes	15
Installed flashing around ranch house coal hatches	14
Installed metal thresholds	100
Replaced gutters	8

C. Labor Crew:

Tree removal orders	39
Top soil fills made	12
Prefab fill-in and sidewalk removal	5

LINOLEUM AND CARPENTER SHOP

FOREMAN - R. M. MARTIN

JOB DESCRIPTION	NO. COMPLETED
Replaced bath wall tile	8
Repaired bath wall tile	4
Replaced bath floor linoleum	7
Repaired bath floor linoleum	1
Replaced bedroom floor linoleum	4
Repaired bedroom floor linoleum	1
Replaced living room floor linoleum	1
Replaced dining room floor linoleum	1
Replaced kitchen floor linoleum	20
Repaired kitchen floor linoleum	2
Replaced hall floor linoleum	2
Replaced steps linoleum	10
Replaced kitchen sink top linoleum	84
Repaired kitchen sink top linoleum	1
Replaced work bench linoleum	5
Jack and Shim	7
Repair porches	54
Replaced broken sinks	2
Repaired thresholds	3
Replaced sash balances	1
Chempoint	126
Paint touch ups	90
Repaired exterior doors	1
Repaired interior doors	2
Interior house repair	119
Drilled weepholes	15
Repaired siding	1
Repaired walls	1
Sidewalk forms	6
Repaired floor boards	3
Repaired roofs	15
Repaired window screens - Ranch houses	41

COMMUNITY SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
OCTOBER 1954

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	17	28
Transfers In	0	0
Transfers Out	1	1
New Hires	0	0
Terminations	0	0
Total - End of Month	16	27

GENERAL

The fifth annual Policeman's Ball was held at the Kennewick Social Club on October 21 and 22. This is the annual fund raising event for the Police Athletic League, the profits from which are used for the numerous youth activities sponsored by the P.A.L.

Six thousand pamphlets entitled "A Message to School Children and Their Parents" were distributed to school children during the month of October. These pamphlets contain certain precautions for school age children with regard to being approached by strangers.

One group of Boy Scouts and two groups of Camp Fire Girls were escorted for a tour of Police Headquarters during the month.

TRAFFIC	1954 Sept.	1954 Oct.	1953 Sept.	1953 Oct.	1954 Total To Date	1953 Total Same Period
Reportable accidents	20	19	13	19	196	194
Property damage accidents	18	16	10	15	169	162
Injury accidents	2	3	3	4	27	30
Total persons injured	2	4	3	8	28	42
Fatal accidents	0	0	0	1	0	2
Accidents-daylight hours	15	12	10	12	138	135
-darkness	5	7	3	7	58	59
Accidents-business district	9	12	1	5	61	68
residential "	8	6	10	10	105	98
other "	3	1	2	4	30	28
Accidents investigated	16	13	12	15	126	132
Criminal complaints filed	13	8	10	10	93	103
Violations contributing to accidents:						
Negligent driving	5	4	0	1	37	20
Fail. to yield r.o.w.	6	5	8	6	60	73
Following too closely	4	4	0	1	34	28
Drunk driving	0	1	0	3	3	8
Pedestrian violation	1	1	0	0	7	3
Inattention to driving	1	3	2	0	5	4
Reckless driving	0	0	0	0	5	4
Speeding	0	0	0	1	1	6
Unsafe speed	0	0	0	0	21	8
Improper backing	0	0	0	1	8	11
Disregarding stop sign	1	0	0	1	2	5
Hit and run	0	1	0	0	1	1
Improper passing	0	0	0	0	2	3
Improper turn	0	0	0	0	1	3
Failure to signal	0	0	0	0	1	0
Wide right turn	0	0	0	1	1	1
Wrong side of road	0	0	0	0	0	1
Improper parking	0	0	0	0	1	0
Bicycle violation	0	0	0	2	3	3
Asleep at wheel	0	0	0	0	0	1
Defective equipment	1	0	2	0	1	2
Dog in street	0	0	1	2	0	3
Debris in street	1	0	0	0	1	0
North Richland:						
Reportable accidents	16	7	7	5	83	78
Property damage accidents	15	6	7	5	71	66
Injury accidents	1	1	0	0	12	12

Richland	1954 Sept.	1954 Oct.	1954 Ave. Per Accident Sept.	1954 Ave. Per Accident Oct.	1953 Ave. Per Accident Sept.	1953 Ave. Per Accident Oct.
Accident property damage	$5,189.00	$5,730.00	$259.45	$301.58	$270.12	$376.58

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
Total number of men reporting at the range 7
Number of men fired over the Army-L course 7

Qualifications on the Army-L course as follows:

Marksman	2	28%	Sharpshooter	2	28%
Expert	3	44%	Unqualified	0	

ACTIVITIES AND SERVICES	September		October	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	2	4	8	5
Bicycles impounded	11	0	6	0
Bicycle violations, other	0	0	0	0
Bicycles registered	57	0	35	0
Children lost or found	15	4	12	2
Complaints investigated	27	8	27	4
Deaths reported	0	1	3	1
Dog, cat, loose stock complaints	6	0	6	1
Dogs, cats, reported lost or found	8	1	10	2
Doors, windows found open in facilities	52	12	23	9
Emergency messages delivered	9	95	11	89
Fires investigated	3	2	12	6
Guns registered	18	0	27	0
Law enforcement agencies assisted	3	1	4	0
Letters of inquiry	156	0	156	0
Miscellaneous escorts	15	1	5	3
Persons injured by dogs	4	1	0	0
Plant departments assisted	23	2	28	3
Prisoners processed through Jail	14	11	14	18
Private individuals assisted	15	1	13	1
Property lost or found	17	2	12	2
Records inquiries	85	0	84	0
Reports processed through Records	289	170	224	120
Street lights out reported to Electrical	111	18	170	15
Traffic safety meetings (Oct. attendance - 350)	12	0	5	0
Total	952	334	895	281

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
OCTOBER 1954

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	-	2	-	-	-	-	-	2
4. Aggravated Assault	-	-	-	-	-	-	-	-
5. Burg.-Break. & Entry	4	1	2	-	-	-	-	1
6. Larceny Over $50.00	2	3	-	-	-	1	1	-
Under $50.00	16	6	-	1	3	-	1	-
7. Auto Theft	3	1	2	-	1	1	-	-
TOTAL PART I CASES	25	13	4	1	4	2	2	3
PART II								
8. Other Assaults	4	-	-	-	-	-	4	-
9. Forgery & Counterfeit	-	-	-	-	-	-	-	-
10. Embezzlement & Fraud	5	1	-	1	1	-	-	-
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons:Carry:Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	-	2	-	-	-	-	-	2
15. Offenses Ag. Fam. & Child	1	-	-	-	1	-	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	3	8	-	-	-	-	3	8
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	-	1	-	-	-	-	-	1
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intoxicated	3	2	-	-	-	-	3	2
23. Viol. Rd. & Dr. Laws:								
Fail. to Stop & Identify	3	2	-	-	-	-	1	2
Speeding	13	6	-	-	-	1	13	5
Stop Sign	15	6	-	-	2	2	13	4
Reckless Driving	2	2	-	-	-	-	2	2
Right of Way	3	7	-	-	1	-	2	7

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART II								
Negligent Driving	13	11	-	-	-	-	13	11
Defective Equipment	3	1	-	-	-	-	3	1
Illegal Passing	1	-	-	-	-	-	1	-
24. Parking	13	29	-	-	5	-	8	29
25. All Other Traff. Viol.	21	5	-	-	1	-	20	5
26. All Other Offenses:								
Mal. Mischief	5	1	-	-	4	1	1	-
Vandalism	2	3	-	-	-	1	-	-
Bike Violations	4	-	-	-	4	-	-	-
Public Nuisance	6	-	-	-	-	-	6	-
Investigation	2	4	-	-	2	4	-	-
Prowler	5	1	1	-	1	-	-	-
Disturbance	1	1	-	-	1	1	-	-
Car Prowl	1	1	-	-	-	-	-	-
Arson	-	1	-	-	-	1	-	-
Illegal Shooting	2	-	-	-	2	-	-	-
Obscene Phone Call	2	-	-	-	2	-	-	-
Molesting	1	-	1	-	-	-	-	-
Juvenile Delinquency	3	1	-	-	2	-	1	1
Violation of Parole	1	-	-	-	-	-	1	-
27. Suspicion	-	-	-	-	-	-	-	-
TOTAL PART II	138	96	2	1	29	11	95	80
PART III								
28. Missing Persons	6	1	-	-	6	1	-	-
Lost Persons	10	-	-	-	10	-	-	-
Lost Animals	12	1	-	-	1	-	-	-
Lost Property	25	4	-	-	18	-	-	-
29. Found Persons	-	-	-	-	-	-	-	-
Found Animals	1	-	-	-	1	-	-	-
Found Property	15	-	-	-	9	-	-	-
TOTAL PART III	69	6	-	-	45	1	-	-

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.Tr. Acc.	-	-						
31. Pers.Inj.M.V.Tra.Acc.	3	1						
32. Prop.Dam.M.V.Acc.	16	6						
33. Other Traffic Acc.	-	-						
34. Public Accidents)								
35. Home Accidents)	No Accurate Statistics Kept							
36. Occupational Acc.)								
37. Firearms Accidents	-	-						
38. Dog Bites	-	-						
39. Suicides	-	-						
40. Suicide Attempts	-	-						
41. Sud. Death & Bod. Found	-	-						
42. Sick Cared For	-	-						
43. Mental Cases	-	-						
TOTAL PART IV	19	8						
COMPOSITE TOTALS								
PART I,II,III,IV CASES	251	123	6	2	78	14	97	83

*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: order 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	$4,778.92
Property reported stolen	No. Rich.	$2,055.00
Property recovered	Richland	$4,131.00
Property recovered	No. Rich.	$1,445.00

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore. & Calif. Six Months (July - Dec.)		One Month Average	1953 July - Dec.	1954 September	1954 October
Murder	.468	.078	1	-	-
Robbery	12.925	2.154	-	-	-
Agg. Assault	13.100	2.183	-	-	-
Burglary	80.750	13.458	19	1	3
Larceny	228.430	38.072	91	24	18
Auto Theft	40.380	6.730	6	1	4

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July - Dec.)		One Month Average	1953 July - Dec.	1954 September	1954 October
Murder	.378	.063	1	-	-
Robbery	7.900	1.317	-	-	-
Agg. Assault	2.280	.380	-	-	-
Burglary	69.550	11.590	19	1	3
Larceny	211.700	35.283	91	24	18
Auto Theft	38.950	6.491	6	1	4

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953 July	Richland 1953 Dec.	Richland 1954 Sept.	Richland 1954 Oct.
Robbery	-		-	-
Burglary	22%		-	-
Larceny	18%		4%	17%
Auto Theft	17%		-	-

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF NORTH RICHLAND)

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

Wash.Ore. & Calif. Six Months (July - Dec.)		One Month Average	1953 July - Dec.	1954 September	1954 October
Murder	.187	.032	-	-	-
Robbery	5.170	.862	-	-	2
Agg. Assault	4.240	.707	-	-	-
Burglary	32.300	5.383	4	-	1
Larceny	91.370	15.228	60	10	9
Auto Theft	16.150	2.692	13	3	1

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July - Dec.)		One Month Average	1953 July - Dec.	1954 September	1954 October
Murder	.227	.038	-	-	-
Robbery	3.160	.527	-	-	2
Agg. Assault	.910	.152	-	-	-
Burglary	27.820	4.637	4	-	1
Larceny	84.680	14.113	60	10	9
Auto Theft	15.580	2.597	13	3	1

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland 1953 July - Dec.	No. Richland 1954 September	October
Robbery	-	-	100%
Burglary	-	-	100%
Larceny	19%	-	-
Auto Theft	20%	33%	-

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

MONTHLY REPORT — RICHLAND POLICE DEPARTMENT — JUVENILES INVOLVED — OCTOBER

OFFENSES	NO. CASES	JUVENILES	SEX	5	6	7	8	9	10	11	12	13	14	15	16	17
RICHLAND																
Juvenile Delinquency	2	3	M					2		1						
		1	F											1		
False Fire Alarm	2	4	M	1	1	2										
Larceny	4	8	M			1	1	1	3		2					
		2	F									1	1			
Mischief	2	3	M						1		1	1				
Disturbance	1	2	M												1	1
Illegal Shooting	1	2	M										2			
TOTALS	12	25		1	1	3	1	3	4	1	3	2	3	1	1	1
NORTH RICHLAND																
Vandalism	1	1	F		1											
Arson	1	1	M								1					
		1	F			1										
Burglary	1	3	M								2			1		
Mischief	1	1	M								1					
TOTALS	4	7			1	1					4			1		

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
OCTOBER 1954

VIOLATIONS	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	SENT JAIL	SENT SUSP.	LIC. SUSP. OR REV.	CASES ORIG. PREV. MONTH	BAIL FORF.	FINES	FINES SUSP	
Defective Equipment	5	2	1	3					1	7.50	10.00		
Dis. license not Own	1	1									5.00		
Drv. While Lic. Susp.	1			1									
Drunk Driving	1			1					1				
Excessive Noise	1		1							5.00			
Failure to Dim Lt.	1	1									5.00	5.00	(1)
Fail to Stop & Identify	1	1								5.00			
Fail TYROW	6	5	1							15.00	85.00	22.50	(2)
Fin. Resp. Act.	1	1				1							
Following Too Close	1	1									10.00		
Illegal Passing	1	1									10.00	10.00	(1)
Inattention To Driving	3	2	1							15.00	17.50	7.50	(1)
Improper Vehicle Plates	2	1	1							10.00	10.00	10.00	(1)
Improper Turn	1		1							10.00			
Invalid Driver's Lic.	17	9	6	1	1				1	54.00	55.00	20.00	(3)
Negligent Driving	14	12		1	1				3		190.00		
Op. Mtr Veh W/Out OP	1	1									5.00		
Parking	10	1	7	2						24.50	3.50	3.50	(1)
Perm Illegal Disp of Lic.	1	1									5.00		
Speeding	15	3	10	2						102.50	25.00	7.50	(2)
Stop Sign	14	6	6	2					2	57.50	38.50	12.50	(2)
Reckless Driving	4	4						3	1		127.50	32.50	(2)
Removing Tra.Con.Device	1		1							10.00			
Public Intoxication	6	1	5							62.50	15.00		
Public Nuisance	5	3	1	1		3	1			150.00			
Third Degree Assault	4	3	1			1	1				53.00	25.00	(2)
TOTAL	118	59	43	14	2	5	2	3	10	$514.50	$685.00	$171.00	(18)

One Drunk Driving Case Amended to Negligent Driving
One Reckless Driving Case Amended to Negligent Driving

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
OCTOBER 1954

VIOLATIONS	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	SENT. JAIL	SENT. SUSP.	LIC. SUSP. OR REV.	CASES ORIG. PREV. MON.	BAIL FORF.	FINES	FINES SUSP	
Defective Equipment	1	1									5.00		
Drv. While Lic. Rev.	1				1								
Drunk Driving	2	2				1		1			77.50		
F.T.Drive in Proper Lane	1		1							10.00			
F.T. Stop & Identify	2	2				2							
F.T.Y. Right of Way	5	5									78.00	47.50	(5)
Financial Resp. Act	1	1				1	1				3.00		
Illegal Parking	24	5	9	10						31.50	17.50	7.00	(2)
Invalid Driver's Lic.	8	6	1	1		1		1			37.50		
Invalid Vehicle Plates	1		1							5.00			
Negligent Driving	11	9	2							85.00	167.40	30.00	(2)
No Registration	2	1			1					10.00			
Speeding	4	1	2	1						17.50	7.50		
Stop Sign	5		4	1						32.50			
Taking Auto W.Out O.P.	1			1									
Public Intoxication	6	1	5			1				65.00			
Vagrancy	1	1				1							
TOTALS	76	30	26	14	2	7	1	2		$256.50	$393.40	$84.50	9

One Reckless Driving Case W/Liquor Involved, amended to Negligent Driving

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
OCTOBER 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	20	19	0	0	0	0	2	3
North Richland	16	7	0	0	0	0	1	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken		Other Causes	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	5	4	6	5	0	1	9	9
North Richland	5	0	4	3	1	1	6	3

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other Viol.		Totals	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	0	0	1	2	0	5	0	1	0	0	2	1	3	9
North Richland	0	1	0	2	0	0	0	0	2	0	0	0	2	3

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way		Neg. Drv.		Parking V.		Other V.		Totals	
	Sept.	Oct.	Sept	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Rich.	26	15	32	14	6	2	6	5	10	6	21	14	10	10	39	38	150	104
N.R.	24	4	9	5	2	2	5	1	2	5	15	11	64	26	32	18	153	72

TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY.

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT
COMMUNITY SECTION
October, 1954

PERSONNEL - COMMERCIAL & RESIDENTIAL PROPERTY UNIT:

	October Exempt	October Non-Exempt
Beginning of Month	8	23
End of Month	8	25
Net Change	0	+2

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
September	1,642	178	120	1	1,762	179
October	1,629	182	120	1	1,749	183
Net Change	-13	+4	0	0	-13	+4

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	37	18	3	0	40	18	58
Back Charges	1	0	0	0	1	0	1
FY Work Orders	712	264	29	0	741	264	1005
FY Back Charges	33	1	4	0	37	1	38

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Supplemental Agreements:

a. D. F. McGuire d/b/a "Mickey's Shoe Renewing" - to provide for a new rent, separate payments for utilities, and certain other changes in connection with renegotiation of the basic agreement.

b. Jimmy Walsh d/b/a "Richland Tire Exchange" - to provide for the discontinuance of refuse-removal service by General Electric Company.

c. Richland Dental Center - to provide for a change in lease term, re-assignment of leased space and adjustment in rental.

d. Richland Gas Co. - to provide for an assignment of lease and to permit mortgaging of the leasehold interests.

2. Business Development:

a. Invitations to Bid were mailed to forty-eight prospective Lessees in connection with leasing the vacant land site at the northwest corner of Lee Boulevard and Goethals Drive, Downtown Business District.

b. Invitations to Bid were mailed to sixty-five prospective Lessees in connection with leasing the vacant land site at the corner of Wellsian Way and Lee Boulevard.

c. Two proposals were received in answer to our Invitations to Bid in connection with leasing the Government-owned building formerly occupied by Safeway Stores, Inc. These were opened and read on October 5, 1954.

d. The bid of Mr. Arvid Thorsness was accepted in connection with leasing the land site at the southeast corner of Williams Boulevard and Goethals Drive.

e. The bid of J. R. Parcell was accepted in connection with leasing the vacant land site at the southwest corner of Williams Boulevard and Goethals Drive.

f. The bids of Continental Oil Company and Mrs. Frances S. Taylor were accepted in connection with leasing the vacant land site at the southeast corner of Knight Street and Stevens Drive.

g. The bid of Robley L. Johnson was accepted in connection with leasing the Government-owned Building 89-X located on Lee Boulevard.

GENERAL:

A. Commercial:

1. Austin Wilhite & Mary Duncan, co-partners, d/b/a Richland Marina, opened for business in the Government-owned building located at 94 Lee Boulevard.

2. Dr. R. J. Whistler opened in the Medical-Dental Building for the practice of dentistry.

3. R. J. Skewes terminated their sublease with Midstate Amusement Corporation covering operation of the Richland Paint & Floor Covering at 260 Williams Boulevard.

4. Robert W. Huckleberry, subleasing from Midstate Amusement Corporation, covering a paint and floor covering business at 260 Williams Boulevard opened for business.

5. L. A. Dean, d/b/a Dean's Heating, opened for business in the L. G. Cook Building at 885 Stevens Drive.

6. Sadler's School of Art terminated their sublease with Richland Development Company, Inc. at 1329 George Washington Way.

7. The Atomic Energy Commission approved assignment of sublease with V. O. McVicker, from Calvin Decker and Jacob J. August to Jacob J. August, covering the operation of Fission Chips at 226 Williams Boulevard.

8. Orville W. Couden, d/b/a Skip's Drive-In, opened for business at 831 Stevens Drive.

9. The Atomic Energy Commission approved the assignment of lease from Bedri J. Saad to Michel Saad who will continue to operate the Richland Shoe Salon at 624 Biddle.

10. Dr. Edgar W. Warren opened for business in the Medical Arts Building.

11. Dr. Lester S. Schilke opened for business in the Medical Arts Building.

12. L. R. Heaton opened his service station for business in connection with the operation of the bus depot.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland.

1. Auto Accessories
2. Vulcanizing & Recapping
3. Service Stations
4. Men's Clothing Store

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION

October, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial:

	SEPTEMBER			OCTOBER		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Number of Government-owned Buildings	40	8	48	40	8	48
a. Number of Prime Lessee Businesses	36	10	46	37	10	47
b. Number of Sublessee Businesses	17	0	17	17	0	17
c. Total Businesses in Government-owned Buildings	53	10	63	54	10	64
2. Doctors and Dentists in Private Practice	32	0	32	35	0	35
3. Number of Privately-owned Buildings	68	6	74	68	6	74
a. Number of Prime Lessee Businesses	44	5	49	45	5	50
b. Number of Businesses operated by Sublessees	110	0	110	110	0	110
c. Total Businesses in Privately-owned Buildings	154	5	159	155	5	160
4. Privately-owned Buildings under Construction	3	2	5	3	2	5
5. Total Number of Businesses in Operation	207	16	223	209	16	225

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION October, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

B. Noncommercial:

	SEPTEMBER			OCTOBER		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Government-Owned Buildings						
a. Churches	2			2		
b. Clubs and Organizations	5			5		
c. Government Agencies	2			2		
Total	9			9		
2. Privately-owned Buildings						
a. Completed and in Use	10	2	12	10	2	12
b. Under Construction	6	0	6	6	0	6
Total	16	2	18	16	2	18
3. Church Plots and Buildings in Private Ownership	2		2	2		2
4. Pasture Land Permits	104			104		

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

PROGRESS REPORT

	Orders incomplete as of September 30	Orders issued 9-30 to 10-30	Total orders Incomplete as of October 30, 1954
Service orders	431	2410	424
Work orders	531	499	844
Service charges		231	

Principal work order loads	Incomplete as of September 30, 1954	Incomplete as of October 30, 1954
Laundry tub replacement	87	32
Tileboard bathroom	11	15
Kitchen floor linoleum	96	125
Kitchen cabinet linoleum	87	42
Shower stall	10	9

158 alteration permits were issued, as compared to 173 issued in September.

Install automatic dryer	45	Install automatic washer	16
Convert to oil	39	Install fence	5
Basement excavation	9	Install stoker	5
Sand floors	1	Install new circuits	7
Install fireplace	1	Install fan in window	1
Install automatic controls on furnace	1	Remove partitions	4
Construct storage shed	2	Install TV antenna	1
Install clothes closet	2	Reverse range & refer	2
Install roof on porch	1	Erect garage	1
Install shelves and work bench	1	Install tile	1
Install back door	2	Move hot water heater	2
Install fan in kitchen	1	Install humidifier on furnace	1
Remove laundry trays	1	Remove broom closet	2
Install windows	1	Install water softener	1
Install mail slot	1	Install dishwasher	1

881 inspections were made, as compared to 798 made in September.

Alteration permits	31	Basement	5
Bathroom	13	Ceiling	4
Doors	12	Fill	7
Floorboard	16	Laundry trays	31
Linoleum	39	Lot lines	1
Paint	123	Porch & steps	21
Recall range & refer	16	Shower stall	11
Screens	7	Sidewalk	37
Sink	12	Toilet seat	18
Trees	81	Walls	2
Yard	14	Renovation rechecks	37
House	9	Dormitories	64
Miscellaneous	6	Cancellation	97
Renovation	88	Shows (new tenants)	79

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

TENANT STORES

Merchandise Issued	Total Amount
Shades	382
Reflectors	7
Drip trays	7
Meat tender	3
Ice cube trays	15
Hydrator glass	1
Furniture delivered	25
Furniture recalled	34
Refer parts	3
Space heaters	1
Door stops	16
Furnace shaker	1
Caulking compound	2

RECALL AND DELIVERY OF RANGES AND REFRIGERATORS -- MONTH OF OCTOBER

	DELIVERY		RECALLED	
	REFERS	RANGES	REFERS	RANGES
1Br.	0	0	1	1
2Br.	1	1	5	3
3Br.	1	1	0	0
A	0	2	0	3
B	2	0	0	0
F	1	0	1	1
H	0	1	2	2
Q	0	0	0	1
U	0	0	0	1
V	0	1	0	0
Y	2	2	1	1
Apt.	1	0	0	0
Tract	0	0	2	1
	8	8	12	14

Property transfer: 10-4-54 TA refer No. 480, 10-6-54 TA refer No. 4322
10-6-54 TA refer No. 154.
Excess: 10-26-54 10 each TA refers, 10 each AB ranges.
Salvage: 10-27-54 3 each TA refers
85 each ice cube trays.

IN WAREHOUSE:
TA refers 7' -----14
GE refers 8' ----- 1
GM refers 7' ----- 1
Frig. SO 82 ----- 2
SC ranges -------20
GE ranges -------13
GM refers -------- 2

COMMERCIAL & RESIDENTIAL PROPERTY UNIT

RESIDENTIAL LEASES

OCTOBER 1954

DORMITORY REPORT

Dormitories:

	Beds Available	Vacant beds	Occupied Beds
Men	477	51	426
Women	381*	42**	339*
Total	858*	93**	765*

*This includes 2 beds used for Dorm Offices
**This includes 4 vacant beds in Dorm M 13

Waiting lists	Single Rooms	Double Rooms
Men	0	0
Women	2	0

The following Dormitories are in stand-by condition:

W 21	50 beds	W 16	50 beds	M 7	39 beds
W 17	50 beds	W 15	50 beds		

Total beds 239

RESIDENTIAL LEASING

CANCELLATIONS		ALLOCATIONS	
Voluntary terminations	14	Houses allocated to new tenants	46
R. O. F.	0	Exchanged houses	13
Discharge	0	Moves (within Richland)	23
Transfers	4	Turnovers (divorce,death,schools)	2
Retirement	1	Wherry house move to G.E. house	1
Move off project	24		
Divorce	2	Total leases signed	85
Death	0	Total cancellations	85
Move to Wherry house	0	Houses assigned "As Is"	29
Military service	1	Houses sent to "Renovation"	33
Total	47	Applications pending	248

Removal of 65 prefabricated type houses: Excess papers have been sent to theStores Unit on the following number of prefabricated type houses, and one (1) Tract house #N-1135

	1BR	2BR	3BR	Total
March	4	0	0	4
April	14	6	2	22
May	16	2	0	18
June	8	2	0	10
July	4	3	1	8
September	1	0	1	2
October	0	1	0	1
Total	47	14	4	65

RICHLAND HOUSING

HOUSING UTILIAZTION AS OF MONTH ENDING OCTOBER 30, 1954
HOUSES OCCUPIED BY FAMILY GROUPS

	Conven	A&J	T	Pre Cut	Ranch	Pre Fab	Dorm Apt.	A&J Apt.	2BR Apt.	4th Hsg.	Tract	Total
G. E. Employees	2224	255	10	386	838	1131	10	53	62	204	38	5211
Comm. Fac.	91	17		29	57	49		4	4	6	2	259
AEC	66	29		20	56	15		4	3	11	3	207
Other Gov't	7	2			3	1						13
Post Office	6				2	8				1	3	20
Schools	61			7	11	45			1	1		126
Comm. Activities	10			2	6	4					1	23
Med. Facilities	4	18			3	1				3		29
Chas. T. Main	3			2	5	5				2		17
Kaiser Eng.	6	7			7	2						22
J. A. Jones	2	2			2							6
Blaw-Knox	3	2		2	2							9
P. S. Lord					1							1
Minor Const.					1			1				2
Commonwealth Inc.						1						1
Not Certified	6	1			4	4		1		1		17
Turnover	1											1
House Exchange	3			1	1	1						6
Total	2493	333	10	449	999	1267	10	63	70	229	47	5970
Assigned Leases Written	1			1	1	1		1				5
Assigned Leases Not Written						1				1		2
Available for Assignment	6					7						13
Total	2500	333	10	450	1000	1276	10	64	70	230	47	5990

	Begin Month	Moved In	Moved Out	End of Month	Diff
Conventional Type	2492	+20	-19	2493	+1
A&J Type	332	+2	-1	333	+1
"T" Type	10			10	
Precut Type	449	+4	-4	449	
Ranch Type	1000	+6	-7	999	-1
Prefab Type	1265	+29	-27	1267	+2
Dorm Apts.	10			10	
A&J Apts.	64	+3	-4	63	-1
2BR Apts.	69	+1		70	+1
Fourth Housing	230		-1	229	-1
Tracts	48		-1	47	-1
Total	5969	+65	-64	5970	+1

COMMUNITY SECTION
RICHLAND FIRE DEPARTMENT
MONTHLY REPORT

October 1954

Organization and Personnel	Exempt	Non-Exempt
Employees beginning of Month	67	0
Transfers In	0	0
Transfers Out	1	0
Terminations	0	0
New Hires	0	0
End of Month	66	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated)	Government	$ 62.00	$ 0.00
	Personal	913.00	3,195.19
	October Total	$ 975.00	$3,195.19
	Year's Total	11,359.23	$7,280.19*

*Does not include August 6, Drug Store Fire in North Richland - Settlement still pending.

	Richland	North Richland
Response to fire alarms	29	35
Investigation of Minor fires	1	0
Ambulance Responses	40	0
Inside Schools or Drills	16	8
Outside Drills	11	6
Safety Meetings	7	2
Security Meetings	4	2
Fire Alarm Boxes tested	201	112

In addition to numerous individual visitors to Richland and North Richland Fire Stations during Fire Prevention Week, firemen conducted fire station group tours during October for 859 juveniles and 60 adults. Seven Fire Department vehicles participated in the October 2, Fire Prevention parade, some of which afterwards staged an outdoor fire demonstration at Riverside Park. Nine fire apparatus demonstrations were performed at grade schools and three fire service hydraulics demonstrations were performed for Columbia High School physic classes. An additional demonstration was performed at the Boy Scout Camporee. Fire apparatus participated in a half-time demonstration at the October 8, high school football game.

Two Howe, 750 gallon per minute, pumpers, originally received from Savannah River Project, were remodelled on contract and returned October 1. Will replace undersized and outmoded apparatus now in service as soon as radio equipment is installed.

Three AEC Airport standbys were performed for plane landings and take-offs in October.

Fire Prevention

A total of 47 Richland and 13 North Richland building inspections resulted in four hazard reports being submitted. A total of 107 fire extinguishers were inspected and three installed during the month.

The campaign activities broke our past records in Community-wide sponsorships, starting with a 40 unit Fire Prevention parade followed by an excellent fire show witnessed by an estimated 2000 people. A Speaker's Bureau of Toastmasters and Fire Department Officers spoke at 27 gatherings to 1288 people.

A tremendous amount of activity was conducted by Richland school children in poster, essay, slogan, fire skits, fire drills, songs, lectures, etc. The six major civic clubs co-sponsored a 16MM sound movie of the principal events which were shown over TV in Spokane and scheduled for Yakima TV. The Movie will accompany our scrapbook in National Contests and will be available for future showings. GE loaned a vacant prefab for use as a "House of Hazard" contest where 1011 children competed for 35 silver dollar prizes. The VFW Auxiliary sponsored the contest. Churches took an active part, including one church conducting 6 attendance contests based on fire prevention. Excellent industrial displays and mercantile window displays were entered in two contests. Approximately 70,000 pieces of promotional literature were ordered and used by the sponsoring organizations. We have hopes of maintaining our National rating in this year's program to add to our 1st Place in State for last five years and two 1st Places in Nation.

Other Activities

Assistant Fire Marshal assisted at the AEC Public Aution to control the overflow crowd during a two-day period.

Assisted AEC Safety and Real Estate personnel conduct an inspection of an out-of-town propane gas delivery truck and methods of operations in North Richland Trailer Camp.

Shut down hospital sprinkler system to permit tie-in of new water main on Stevens Drive.

Assisted AEC Engineering and Contractor in performing acceptance tests of the new fire alarm systems in Lewis & Clark and Marcus Whitman schools.

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
OCTOBER 1954

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees Beginning of Month	5	16
Transfers In	0	1
Transfers Out	0	1
Terminations	0	0
Total End of Month	5	16

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	6
Anchors set and guys installed	3
Street lights repaired and steel mast arms installed	0
Street lights relamped - mercury vapor	13
Street lights relamped - 6000L and 4000L, 1100 Area	126
Street lights relamped - 6000L and 4000L, 700 Area	13
Flood lights relamped, 1100 Area	33
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	0
Primary line footage added	300
Primary line footage removed	300
Transformer Kva added	482.5
Transformer Kva removed	187.5
Net transformer Kva installed	295
New services installed - residential	0
New services installed - commercial	23
Services removed	5
Scheduled outages - primary	4
Scheduled outages - secondary	11
Unscheduled outages - primary	2
Unscheduled outages - secondary	2
Standby and escort	1
High voltage tree trimming	120
Low voltage tree trimming	21

TRAFFIC SIGNALS

Relamping	138
Operational failures	1
Installations	0
Removals	0
Routine maintenance checks	46

RICHLAND ELECTRICAL UNIT

Routine check R. R. signal at Van Giesen	4
Total signals in operation - automatic	19
Total signals in operation - manual	3
Total signals in operation - flasher	1

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	0
Electrical motors checked and serviced - water	94
Electrical motors checked and serviced - sewage	71

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	4
Outside circuit checks	4
Inside faults repaired	1
Outside faults repaired	2
New circuits placed in operation	0
New boxes placed in operation	0

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	5
" " " " " " - BB1S2	5
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	24

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Radio interference checks	0
Voltage and load checks	2
Meters tested - customer's request	4
New meters shop tested	13
Faulty meters replaced or repaired	3
Damaged meters and covers	1
Residential read-ins	167
Residential read-outs	179
Residential disconnects	16
Residential reconnects	12
Meters resealed	4

Consumption and Revenue:

	No. of Meters	KWH	Revenue
Residential - Schedule 1	6983	3,586,060	$40,793.71
Commercial - Schedule 2	374	2,841,347	24,462.44
Total	7357	6,427,407	$65,256.15

RICHLAND ELECTRICAL UNIT

COMMENTS

Rebuilding of six spans of distribution line south of Abbot and west of GW Way was completed by transferring of primary and secondary lines service wires and transformer to new poles, and removal of six old rotted poles - 10-21-54.

Installed three spans of primary line to serve Central United Protestant Church building now in progress. Also installed three 37.5 Kva transformers which were to serve new building only, as Assembly of God Church was also connected to new lateral. Old line from Sacajawea School was partially removed.

Replaced three 37.5 Kva transformers to Well No. 2 at Bomber Bowl with three No. 10 Kva transformers, and will service and test old transformers to Stores with proper credit.

Primary metering installations were completed to North Richland and Columbia well fields which completed metering project IR-174 for Sanitary Water System.

Primary connections were made to provide temporary service to new transformer vault serving Parochial School on Long Avenue. Permanent service will follow when contractor installs 7200 volt cable potheads to entrance cable on pole.

Removed services from following locations, due to excessing of buildings:

331 Sanford, 703 Thayer, 91-X Building, 1004 Abbot, and 507 Barth.

Installed services to following locations:

885 Stevens, 877 Stevens, and new Bus Depot gas station.

Installed one 100 and one 25 Kva transformers to serve Parcell's station at Duane and Lee, to combine Standard Oil Station, By's Burgers and two future sites on this station. 50 Kva station now serving this location will be removed.

Installed five new services to serve new loads in 713 Building.

Installed standard 200 amp cutouts to 7200 volt connection to Central Transportation Area in order to correct fusing trouble caused by non-standard switches originally provided by contractor. AEC Engineering was contacted in an effort to allow Richland Electrical Unit to provide and install future main switches at final connection points in new contract provisions.

Raised metering equipment to swimming pool structure and provided substitute pole butt treatment to compensate for design errors in walk installations to pool area.

Substation preventive maintenance was performed at D1-S-17 in Columbia well field, and all stations serving sanitary water system during outage periods required for metering installations. Also, all motors and controllers to wells.

RICHLAND ELECTRICAL UNIT

Preventive maintenance was performed at the Community House on lighting equipment.

Preventive maintenance was performed on all Crouse-Hinds traffic controllers. Defective track bonding was repaired to railroad signals at Van Giesen and Bypass Highway.

Central Fire Station - Repaired furnace controls, made repairs to No. 10 fire alarm circuit, and cleared ground on No. 1 circuit.

No. 2 Fire Station - Installed thermostat control to two univent heaters.

Repaired sump pump motor to sewage treatment plant.

Unscheduled outages:

Central Transportation - 26 minutes
Contractor, Central U. P. Church - 1 hour
Skip's Drive In - 1½ hours

Scheduled outages for repairs and rearrangements:

Catholic Church, Central Transportation Area, Skip's Drive In, Assembly of God Church, Launderland, swimming pool, and By's Burgers.

Call-outs:

Burned service wires at Skip's Drive In - 16 hours paid call-out time.
No. 10 fire alarm open circuit - 8 paid hours.

Delinquent bills:

Disconnects and reconnects were made to three commercial and 12 residential accounts over two-day period - 10-21 and 10-22-54.

COMMUNITY OPERATIONS SUB-SECTION
ENGINEERING UNIT
MONTHLY REPORT
OCTOBER 1954

PERSONNEL:	Exempt	Non-Exempt	Total
Employees Beginning of Month	7	4	11
Transfers In	0	0	0
Transfers Out	0	0	0
Terminations	0	0	0
Total End of Month	7	4	11

BUILDING PERMITS ISSUED IN OCTOBER:

1. Frank Foy - Residential Garage - 1516 Perkins
2. F. W. Hill - Utility Building - 618 Smith
3. Gordon Williams - Boiler & Fuel Tank Installation - 1375 G. W. Way
4. 5 sign permits

NEW MUNICIPAL CONSTRUCTION STARTED IN OCTOBER:

None

NEW PRIVATE CONSTRUCTION STARTED IN OCTOBER:

1. Frank Foy - Residential Garage - 1516 Perkins
2. F. W. Hill - Utility Building - 618 Smith
3. Gordon Williams - Boiler & Fuel Tank Installation - 1375 G. W. Way

PRIVATE CONSTRUCTION COMPLETED IN OCTOBER:

None

ENGINEERING JOBS COMPLETED IN OCTOBER:

IR-167 - Erosion Control & Development, FY 1953, Part I

C-70505 - Review Plans, Specs., Heating System, Desert Inn

STATUS OF ENGINEERING UNIT PROJECTS:

ESR I-90624 - Title III Services, Storm Drain, G. W. Way - 99% complete.

CA-570 - Replace Raw Water Line #5 Well to Lee Boulevard - Bid opening Oct. 21, 1954 Awaiting award of contract.

ESR I-90604 - Inspection 24" Sanitary Sewer, Swift Boulevard - 99% complete.

STATUS OF ENGINEERING UNIT PROJECTS: (Cont.)

CA-577 - Improvements to Existing Streets, George Washington Way - 99% complete.

L-004 - Guthrie Avenue Sidewalk, Gilmore to Goethals - Construction 75% complete.

L-728 - Installation of Fire Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Department.

L-384 - Improvements to Medical Arts Building, Service Drive - Construction 99% complete.

L-734 - Sewer and Water Lines to Richland Heights Baptist Church - Temporary installation made. To be completed when irrigation canal drained.

IR-165 - Parking Facilities, Kadlec Hospital - Construction 95% complete.

IR-171 - Automatic Bar Screens Sewage Lift Station - To be re-advertised in January, 1955. No bids received at first advertising.

IR-174 - Electricity Metering, Richland Domestic Water System - 99% complete. Awaiting completion notice.

IR-176 - Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park - Design 100% complete.

IR-182 - 6" Water Main, Stevens Drive, Kadlec Hospital to Central U.P. Church - Construction materially complete.

G-01011 - Intersection Change-Over, By-Pass & Stevens Drive - Design started October 30.

STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS:

I 90234 - Inspection, Bauer-Day Housing - Materially complete. Question remains on final surveying and monumenting of intersection.

I 90594 - "As Builts" General, Part II - 95% complete. Work progressing rapidly.

I 90634 - Kadlec Hospital Grounds Improvements - Construction 98% complete.

I 90914 - Utility Lines, Legal Descriptions and diagrams for Churches - 95% complete.

I 90944 - Erosion and Dust Control 300 Area - Project being studied and revised in scope.

I 91014 - Retirement of Separate Irrigation System - Design in progress.

I 91024 - Retirement of Irrigation Canal - Design in progress.

I 91044 - Sketch, Review, and Legal Description, Tidewater Associated Oil Company - 50% complete.

STATUS OF WORK ORDERS:

All new work requests will be shown by work order number.

C-0547 - Design, Title III Inspection, Catskill & Rainier Avenue - Construction 99% complete.

C-11439- Catholic Church Sewer Easement - 50% complete.

C-70524- Pauls, Inc. - 50% complete.

C-70588- Legal Description Plot at southwest corner Goethals & Williams - 75% complete.

C-70589- Legal Description Plot of Land on southeast corner Goethals & Williams - 90% complete.

C-70590- Legal Description of Plot at southeast corner Knight & Stevens - (Continental Oil Co.) - 75% complete.

C-70591- Legal Description of Plot west of By's Burgers - 50% complete.

C-70592- Legal Description of Plot southeast corner Knight & Stevens - (Frances S. Taylor) - 75% complete.

C-70608- Study & Sketch for Utility Lines for "Rose Garden" - 75% complete.

BUILDINGS UNDER CONSTRUCTION:

NOTE: All ESRs for Plans, Specifications, and Inspections were closed as of July 1, 1954. This type of work is now indicated by job title only, the expense of which is lumped and charged against routine expense code "Plans and Specifications". Buildings on which final acceptance has not been made include:

First Baptist Church (Richmond and Raleigh Streets) - Construction 92% complete. No progress this month.

Assembly of God Church - Construction 90% complete. Work progressing slowly.

Alteration Permits - An open active file.

Television Antennae - An open active file.

Plans, Specs., Inspections, Grace Bacon Roller Rink - Construction 98% complete. No progress this month. Open for business.

Plans, Specs., Inspections, Church of Nazarene Addition - Construction 77% complete. Work progressing slowly. Addition being used.

Plans, Specs., Inspections, Richland Heights Baptist Church - Construction 95% complete. Work progressing slowly. Building occupied.

BUILDINGS UNDER CONSTRUCTION: (Cont.)

Plans, Specs., Inspections, Richland Baptist Church, G.W.W. - Construction 98% complete. Work progressing slowly. Building occupied.

Plans, Specs., Inspections, Christ of King Parish (Catholic) - Construction 60% complete. Work progressing nearly as scheduled.

Plans, Specs., Inspections, Central U.P. Church - Construction 65% complete. Work progressing as scheduled.

Plans, Specs., Inspections, Walsh Tire Shop - Construction 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspection, Parcell Service Station (Duane & Lee) - Construction 45% complete. Work progressing as scheduled.

Plans, Specs., Inspection, Couden Drive-In (Stevens & Knight) - Construction 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspection Bus Depot Service Station - Construction 90% complete. Work progressing as scheduled.

COMMUNITY OPERATIONS SUB-SECTION
PUBLIC WORKS & RECREATION UNIT
MONTHLY REPORT
OCTOBER 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	* 6	37
Transfers Out	0	0
Transfers In	0	1
New Employees	0	0
Terminations	0	0
Total End of Month	* 6	38

* Does not include one foreman on loan to Water & Sewerage Utilities Unit

ROADS AND STREETS

A 12" corrugated steel culvert approximately 60' long was laid under Sprout Road, east of Geo. Wash. Way, to dispose of surface water and irrigation tail water from the School Farm. Impounded water at this location has covered Geo. Wash. Way several times during the summer season.

Two catch basins on Stevens Dr. at the drainage ditch crossing, which were formerly provided with light weight grills were converted to standard frame and grill and a curb inlet was installed to carry off leaves and debris which had been a problem at this location.

A catch basin box installed by a contractor several years ago on the north side of Symons St., opposite Herman's Apparel, was found to be faulty in that the forms for the box had apparently spread and allowed concrete to fill the outlet pipe. Necessary repairs have been completed.

A catch basin and connecting pipe to an existing catch basin, designed to function as an inverted siphon, were installed at Benham and Armistead to carry off surface drainage water.

The gutter line and adjacent 6' wide strip were re-graded and paved in the 200 block on Abert to provide for proper drainage of this block.

Blading, burning and general clean-up of drain ditches parallel to roads is now in process.

Approximately 12 miles of shoulders and ditches have been sprayed with a chemical sterilizer to minimize weed growth.

Approximately 200 cu. yds. of sand were screened into the ice control stockpile, bringing the total in storage to about 450 cu. yds.

PUBLIC WORKS & RECREATION UNIT

Service truck parking pads were laid at dormitories M-9, 10, 11, 12, and 13 for the Tenant Relations Unit.

Routine seasonal maintenance of streets, streetsigns, drainage systems, municipal parking lots and sidewalks was continued.

PARKS AND PUBLIC GROUNDS

The winterizing of Parks & Public Grounds irrigation systems, drinking fountains and restrooms has been completed.

All hose, sprinklers and miscellaneous irrigation equipment has been collected and warehoused for the winter. Mowing equipment has also been stored for the season.

The amount of trash dumped on the Columbia River levee has increased during the year, and since the bulk of the material originates in the immediate vicinity, letters have been sent to all residents of streets adjacent to the levee requesting their cooperation in alleviation of this potential health program.

Annual weed removal and clean-up has been started in the shelterbelts and on the levee and will continue through all public grounds and open areas.

Routine maintenance of all parks & public grounds properties was continued.

RECREATION

General

The regular monthly meeting of the Parks & Recreation Board was held 10-6-54. Discussion and evaluation of the adult recreation program formerly held at the Spalding School resulted in a recommendation that this program be discontinued, and this recommendation was carried out.

A joint meeting of the Parks and Recreation, and Planning Boards was held on 10-27-54 for the purpose of determining whether that part of Recommendation #7 of the Planning Board which designates the river front from Bradley Road north to the Corps of Engineers pump station as "Park" should be revised to release some of the frontage for other than parks usage. The Parks Board did not change its opinion that the frontage should remain as "Park" but agreed to further consider this subject at its next meeting.

The first moving picture show of the Elementary Program was held on Friday, October 8th., and approximately 200 children were in attendance.

On October 15th., the elementary and junior Square Dancing instruction classes began at the Community House, with about 250 children in attendance.

The Adult Table Tennis League began on Tuesday, October 12th. Membership in this league totals 67, and play will continue thru March 15, 1955.

The Minnesingers, a sponsored boys choral group, participated in the Red Feather Community Chest Concert at Carmichael Auditorium on Saturday, October 31st.

On October 11th. and 12th., an auction was held by A.E.C. at the Community House with approximately 1500 persons attending the two day affair.

PUBLIC WORKS AND RECREATION UNIT

Attendance Statistics - October 1954

	No. of Sessions	Youth	Adults	Sub-Total
A. Community House				
Adult Table Tennis League	2		81	81
Arts & Crafts Class	7	65	8	73
Ballroom Dancing	4	49	9	58
Elementary Movies	4	602	52	654
Elementary Sq. Dancing	3	563	72	635
Fencing	2		13	13
Fly Tying	1	1	1	2
Games Room (Open Play)	22	1 191	173	1 364
Junior Square Dancing	3	131	9	140
Photography	4	30	6	36
Tumbling	2	23	6	29
Allied Arts	1		30	30
Hi-Spot	9	3 947	44	3 991
International Folk Dancers	3	1	47	48
Junior Sportsmen	1	28	3	31
Junior Stamp	2	29	11	40
Richland Rod & Gun Club	1	37	185	222
Y-Supper Club	3	4	135	139
Election Workers	1		150	150
Government Auction	2		1 900	1 900
Comm. Chest (World Series Television)	2	63	453	516
Miscellaneous Bookings	67	44	1 234	1 278
Total Community House	146	6 808	4 622	11 430
B. Parks & Playgrounds				
School Activities - Columbia	20	7 500	35	7 535
Total Parks & Playgrounds	20	7 500	35	7 535
C. Summary				
Community House and Parks and Playgrounds Total for October 1954.	166	14 308	4 657	18 965
Calendar Year to Date				340 438

SANITATION

Collection schedules were continued and 1064 tons of waste material were collected and disposed of.

COMMUNITY OPERATIONS SUB-SECTION
WATER AND SEWERAGE UTILITIES UNIT
MONTHLY REPORT
OCTOBER 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	*6	21
Transfers Out	0	3
Transfers In	1	0
New Employees	0	0
Terminations	0	1
Total End of Month	*6	17

* Figure includes one shift supervisor on loan from Public Works Unit.

DOMESTIC WATER

Normal operations were continued throughout the month.

Water was shut off to the 3000 Area percolation basin on October 11 and it has been necessary to cut back on the rate of water production from the wells in the area because of a drop in the underground water table. The percolation basin dried out and is presently being cleaned by removing the silt bearing material from the surface with a caterpillar and pan.

On October 21 the 10" water main on Mansfield inside the 700 Area was shut down for a contractor to tie-in a 6" fire line with a post indicator valve to the 713 Building.

The chlorinator pump motor at Duke Well Field burned out and was sent to the motor shop for repairs. Work has been completed and the pump is back in service.

DOMESTIC WATER

	Well Prod. Mil. Gal.	Ave. Da. Prod.	Total Cons.	Av. Da. Cons.
Richland	56,280,000	1,815,400	170,132,700	5,488,000
North Richland	160,060,000	5,163,200	42,646,000	1,375,000
Columbia Field	58,112,200	1,874,500		
300 Area			61,171,000	1,973,000
Total	274,452,200	8,853,100	273,949,700	8,836,000

Maximum daily consumption was 11,508,000 gallons on October 3, 1954.

Community Operations
Water and Sewerage Utilities Unit

SEWERAGE SYSTEM

Normal operations were continued throughout the month.

Two sewer main stoppages caused by tree roots were cleaned during the month.

A new door was installed in the south entrance to the boiler house at the sewage treatment plant. This installation consisted of a small door being cut into a large rollaway door. The installation was made to eliminate a hazard created by operating the large door during wind storms.

SEWAGE

Plant No. 1 - Total Flow	35,670,000	Ave. Daily Flow	1,150,000
Plant No. 2 -	79,295,000		2,557,000
	114,965,000		3,707,000

IRRIGATION SYSTEM

The irrigation canal and irrigation pumping systems were shut down on October 11. Cleaning work is progressing on the canal and the irrigation distribution systems are being winterized by blowing the lines out with compressed air.

GENERAL

On October 21 the Water and Sewerage Unit shift supervisors began providing shift coverage for operation and maintenance of all facilities whose responsibility is charged to the Administration Area Maintenance Sub-Section. Namely; the 700 area, Kadlec Hospital, Central Stores, and the new Transportation Building.

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
OCTOBER 1954

ORGANIZATION AND PERSONNEL

	EXEMPT	NON-EXEMPT
Employees - Beginning of Month	4	7½
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
End of Month	4	7½

GENERAL

Circulation

Books	18,850
Magazines	664
Pamphlets	48
Records	902
Inter-Library Loans	40
Grand Total	20,504

Current Book Stock

Books added this month	259
Books withdrawn this month	4
Grand Total	32,181
Phonograph Records added	64
Phonograph Records discarded	145

Community Operations
Library Unit

Registration

Adult	200
Juvenile	72
Total	272
Total Registered Borrowers	17,871
Children's Story Hour Attendance	601 (446 pre-school; 155 elementary school)
Meetings in North Hall	16

In observance of Halloween special pre-school story hours were held on October 26 and October 27 and a combined Halloween party and story hour for the elementary school age children was held in North Hall Saturday, October 30. Attendance at the pre-school story hours was 136 and 60 at the Halloween party and story hour. Refreshments, game prizes and awards for the best masks were sponsored by the American Association of University Women as part of their sponsorship of the Children's Special Activities Program.

An exhibit of "A Survey of American Sculpture" sponsored by the Allied Arts Association was on display this month in North Hall.

AUXILIARY OPERATIONS AND PLANT PROTECTION SECTION

MONTHLY REPORT - OCTOBER 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	98	100	2 (a)	
Security and Patrol	488	489	1 (b)	
Fire Protection	136	136 (c)		
Office	194	124		70 (d)*
Telephone		77	77**	
TOTALS	918	928	80	70

NET INCREASE: 10

(a) - Administration Area Maintenance
- 3 - Transferred in
- 1 - Transferred out

(b) - Security and Patrol
- 3 - New Hires
- 1 - Transferred in
- 1 - Reactivated
- 1 - Deactivated
- 1 - Transferred out
- 2 - Terminations

(c) - Fire Protection
- 1 - New Hire
- 1 - Deactivated

(d) - Office
- 10 - New Hires
- 1 - Deactivated
- 77 - Transferred out
- 2 - Terminations

* The Records Control Unit transferred to Financial Department on 10-15-54 and the Laundry Unit transferred to Manufacturing Department on 10-15-54.

** The Telephone Sub-Section became a part of Auxiliary Operations and Plant Protection on 10-15-54.

FIRE PROTECTION UNIT

Fire Responses

Construction	10	Loss	$149.00 Private 35.00 G.E. 35.00 Construction
HAPO	7	Loss	----
TOTAL	17		$219.00

Safety and Security Meetings

Number of Security Meetings	12
Number in attendance	81
Number of Safety Meetings	24
Number in attendance	160

Drills Held during October

Outside drills held	102
Inside drills held	137
TOTAL	239

28,650 feet of fire hose and 750 feet of ladders uded for drill purposes during October.

Fire Protection officers held seven classes on fire prevention which were attended by 138 people of various departments.

Approximately 150 employees of Minor Construction were given a fire demonstration at White Bluffs.

A 750 GPM Howe Pumper was received from the Savanna River Plant and arrangements are being made to have it altered to meet HAPO requirements.

Fire Extinguishers

Inspected	1,755
Installed or relocated	11
Tested	658
Delivered to new locations	11
Seals broken and not reported	17
Serviced	365
Weighed	482

Gas Masks

Inspected	80
Serviced	15

OFFICE SUB-SECTION

Plant Mail Unit

Internal mail and postal remained about normal with slight increases in postal outgoing mail and inter-office weight loads increased also. Special assignments included the preparation for mailing of the annual Community Report to all homes in Richland, the preparation and distribution of Good Neighbor Fund ballots to all members of the fund along with the routine distributions.

The 100-K Area mail room is furnished and the personnel lists are in the process of typing and final setup. Operations will begin early in November.

Types and Pieces of Mail Handled	September	October
Internal	4,446,532	4,561,796
Postal	80,390	86,251
Special	2,022	2,262
Registered	14,326	9,767
	4,543,270	4,660,076
Total Postage used	$2,859.70	$3,211.05
Total teletypes handled	2,798	2,599
Total store orders handled	821	727

Addressograph

Addressograph work remained normal except for the suffix changes and plate making for Monthly Payroll.

	September		October	
Type of List	Number of Runs	Total Copies	Number of Runs	Total Copies
Plant Name List	112	138,531	112	157,450
Housing List	28	68,320	12	60,221
Payroll List	13	23,633	10	23,819
Total New Plates	4,365		4,383	
Total Corrected Plates	2,463		5,685	
	6,828		10,068	

Printing

The Exempt Employee Appraisal Guides and related Appraisal Forms were printed ahead of schedule.

A representative of the American Type Founders, Inc. completely checked and made necessary adjustments on the Chief "22" offset press in the Print Shop. This is the first service this machine has had in almost four years of continuous operation.

An audit of Plant Printing Unit operations was completed by the Internal Audit Unit and their report submitted through channels.

Printing (Contin)

Work Completed	September	October
Orders Received	413	406
Orders Completed	392	438
Orders on Hand	129.3	111.4
Copies printed	1,525,442	1,884,573
Negatives masked	928	647
Negatives processed	956	778
Photo copy prepared	289	149
Litho Plates processed	1,137	823

Stenographic Services

Six new employees were assigned to the Stenographic Unit in October -- five Stenographer-Typists and one Stenographer. Five permanent assignments and twenty-one temporary assignments to other units were effected during the month. Sixty-eight work assignments were completed in the Pool.

The work load was fairly heavy but consistent throughout the month and was largely routine. All assignments are current at month's end.

Breakdown of Hours	September	October
Meeting Time	16.5	5
Absentee time	0	40
Machine transcription	23.5	24.5
Letters	21.5	46
Rough Drafts	138.5	63
Dittos, duplimats and xerography	305.5	413.5
Miscellaneous	464	369
Holiday Time	96	
Training time	449	254
Unassigned time	67	60
Total	1,581.5	1,275
Employees on loan to other unit	2,093	1,425
Grand Total	3,674.5	2,700

Duplicating Unit

On October 28,1954, Xerographic and offset duplicating equipment was installed in 1704-K Building, 100-K Area. The establishment of the duplicating office at this location will provide rapid duplicating service for 100-K, 100-B and 100-C areas. Since this is the first heavy duty offset press to be installed in the outer areas, it should also greatly accelerate service on orders involving lengthy runs, orders involving the use of card stock and orders on which the quality requirement is high. Such work formerly had to be run in 700 Area.

Duplicating (Contin)

On October 11, 1954, one Multilith Model 80 duplicator and one employee were transferred from 3000 Area to 200-West Area, in order to handle steadily increasing workloads at that location due to Purex development. This was made possible by a recent downtrend of workloads in 3000 Area. The transfer was therefore made without purchasing additional equipment or adding additional personnel.

During the month, one mimeograph machine and one obsolete Model 1250 offset press were removed from the 300 Area duplicating office and excessed. This was made possible by the installation of a new Multilith offset press on which Library Abstract cards will be duplicated.

Production totals this month were higher than the totals of each of the three preceding months. A total of 969,086 copies were produced this month as compared to 781,659 copies for the month of September, 814,882 copies for the month of August and 722,226 copies during the month of July. Among priority jobs handled this month was an order processed by the 760 Building Duplicating office for Reactor Design and Development Unit. The order consisted of 84 originals and 50 copies each for a total of 4,200 copies which was completed in a little over two working hours.

Duplicating Statistics	September	October
Orders received	3,229	3,285
Orders completed	3,135	3,210
Orders on hand	111	126
Offset plates	13,577	13,466
Offset copies	781,659	969,086
Verifax masters	2,134	2,458
Verifax copies	7,300	9,504
Stencils	661	212
Stencil copies	9,002	2,631
Ditto masters	403	386
Ditto copies	8,367	5,566
Xerox plates	1,297	1,175
Ozalid masters	9	29
Ozalid copies	84	889

Office Equipment Unit

An Appropriation Request in the amount of $116,000 was issued to cover transfer of surplus construction operators equipment to comply with AEC upgrading program.

One Appropriation Request was issued to cover the cost of purchasing two cashier machines for General Books Unit, Financial Department.

Approximately 50% of office furniture and machine requirements for 100-K was delivered during the month.

Office Equipment (Contin)

Office Furniture

Expendable office equipment inventory account 93 was valued at $31,060 at end of first quarter Fy-55. This figure is approximately 70% higher than maximum value established as routine inventory stock. However, this overage is caused by purchases of additional equipment required for Project requirements. This balance will take a downward trend during the next 60 days to the established balance. Acquisition during the quarter was $36,426 with disbursements being $20,240.

A detail by number of pieces of furniture handled during the month is as follows:

Item	Issued	Received	Salvage
Bookcase	39	2	0
Blackboard	8	0	0
Chairs	271	851	69
Costumers	45	33	7
Card File	1	30	2
Cabinets	99	130	9
Desks	92	141	4
Tables	88	101	2
Daveno	0	1	1
Miscellaneous	268	158	22
	911	1,446	116

Stores has been informed that warehousing space required to house office furniture may be reduced by 40% after deliveries are completed to current projects.

Plans are being made to physically inventory capital group office furniture in service by building location. When this inventory is complete, an inventory balance record by each category will be maintained by Office Equipment Unit.

Office Machines

An inventory of all office machines is being taken during the first two weeks in November. The IBM listing by cost codes is being forwarded to unit heads requesting that each machine be checked by HW and serial number, location and correct cost code, adding and deleting those items which do or do not appear. The summary of these IBM listing will be used to reconcile physical inventory with Plant Account Books.

A construction contractor inventory of office machines picked up 17 additional machines not previously listed on IBM maintenance billing.

An inventory balance of 5,157 machines is carried as in service and stock on the 20th of the month. This is four more machines than reported in September.

Office Machine Maintenance Unit

Internal Auditor made an audit of the Unit this month and a completed report has been received.

A representative of the Royal typewriter company spent 1½ days discussing maintenance problems; he also demonstrated Royal's newest electric machine.

A request has been submitted to 300 Area landlord for suitable space in that area for a repair shop. This shop would take the place of the shop presently being used in the 3000 Area which must be vacated when the Army takes over in 1955.

An order was issued to maintain all hospital scales which includes such scales as clinical, baby, freight and food scales. These scales will be checked on a six months routine. Total number of scales is 18.

An order was issued to maintain all city water meters being installed in the commercial facilities unit with a total number of meters maintain at present 25. This number will increase to 50 during the next six months.

Repair tickets were processed as follows:	September	October
	683	640

A new Friez Aerovan Transmitter and Recorder, ordered by the Meteorology Unit, was received. This equipment was completely checked and will be installed at the weather station on Thayer Drive in Richland.

ADMINISTRATION AREA MAINTENANCE SUB-SECTION

AEC-114 New Transportation Facilities: General Office area of Main Shops Building and the Dispatch Building have been accepted from contractor with exceptions. Transportation Section started physical occupancy of premises on October 23. Heating plant is still under supervision of contractor, and has not been accepted.

CA-561 713 Building Alterations: Project is 86% complete. Expected completion date, November 17.

CA-606 Additional Office Space - Central Stores Warehouse: Awaiting final approval, before submission to AEC.

Approximately 500 lineal feet of Hauserman partition and necessary doors were charged out of stock for the 713 Building alterations job. A total of approximately 150 lineal feet of partition was also checked out in October for use in six installations in 700 Area, one in 100 Areas and one in 300 Area.

Outstanding order with E. F. Hauserman Company has been expedited and shipment is promised on November 12.

Eleven office moves were made in October.

Transfer of patrol clothing storage from 770-A to 703 fifth wing basement was completed.

Administration Area Maintenance (Contin)

Additional enclosures were provided in Central Stores Receiving Area for use of personnel in writing reports.

General Maintenance

Canopies for truck beds were built and installed on three weapon carriers for Transportation railroad crews. Lunch tables and benches were also provided for the trucks.

Two large schedule boards were fabricated for Transportation Dispatchers' office.

Two thousand pieces of masonite were cut and sanded for scraping frost from windshields of cars and trucks.

Assistance was rendered railroad and rigging crews in building railroad bridge at village coal yard.

Approximately 96 lineal feet of Hauserman partition was installed in 700 Area buildings for rearrangement of office space.

Two 12-foot mail cabinets, with sorting counters, were built for 100-K mail service.

Large sewing machine table, complete with cabinets and bins, was built for new Transportation Facility.

Plant Security clothing, material and sewing room was moved, complete with cabinets and storage facilities, from 770-A Building to basement of fifth wing, 703 Building. Air duct and lights were revised to serve the space.

Three large 5½' x 4' informational signs were made and installed above traffic lane buildings at Prosser, Yakima and Richland barricades.

Interior paint program was continued on regular schedule. Six rooms were painted in 705, 7 rooms in 703, and the exterior of 716-A was repainted.

Several cabinets, bins and tables were painted and touched up; 500 new sign blanks were prepared for sign painter.

Sign work consisted of 500 radiation monitoring signs, 1500 "wet paint" signs for Community, 100 Scotch-lite signs for Patrol, 10 Burma-shave type signs for security and assorted small signs.

The glazier replaced broken windows in 65 Richland dwellings, averaging approximately 1½ hours each. The remainder of his time, except for a few hours for 700 Area, was spent on outer area glass work.

Electrical transformer was relocated from top of office section of 1167 Building, Central Stores Covered Storage, because of noise disturbance.

Exhaust fans for four rest rooms in third wing of 703 have been received and installation is approximately 50% complete.

Equipment in 716, 729-A and 1131 Buildings was disconnected, in preparation for move to new Transportation facility.

General Maintenance (Contin)

New Kim-start line cords and plugs were fabricated for buses at new Transportation Facility and 22 Kim-starts were installed in buses.

New electrical receptacle circuits were installed at hospital; heater circuit was provided for 734 Building; heat wire and heater circuit were installed in Warehouse 13.

Four buzzer circuits were installed in 703 Building.

Three conduit runs were installed in 1170 Dispatcher Building for telephones.

Eight household type vacuum cleaners were repaired for Stores.

One broken beacon light housing was replaced and service circuits were provided at Meteorlogical Tower.

Exhaust fans were repaired and replaced in 761 ditto room, and a new one was installed in the restroom of 770 Building.

Fifteen desk lamps were repaired for outer area.

Locksmith changed combinations on vault doors at 200-W, master-keyed all door locks at 3746 Building, completed change for doors in 325 Building, master-keyed all panel board locks in 271-C Building and repaired panic hardware on Public Health Building.

Air conditioners in 700-1100 and 600 Area buildings were winterized.

All irrigation lines, except at the hospital, were shut off and drained. The hospital lines are being left on for the watering of new lawns.

Radiator repair in 703 Building was completed. Repair of radiator valves in 761 Building was also completed. Steam condensate meter was installed at Richland Jewelry.

Troughs in men's restrooms in 761-762 Buildings were replaced with modern urinals.

Five "E" valves and eight pilot valves were repaired and tested.

A total of 22 lunch tables were assembled at new Transportation Facility and 80 hours were expended in repair and assembling of office furniture.

Convenience safety platforms were fabricated and installed for load lugger trash containers at docks of 703, 717-A, 761, 762 and 713-A. There are still a few to be completed.

Ash remover for removing carbon soot from stack at 784 was fabricated and installed. Stokers on No. 4 boiler were overhauled. Twenty-five tubes were replaced on No. 3 boiler at 784 Plant.

Holes for hanging signs in 500 metal posts were drilled for 600 Area.

Handrails were fabricated and installed on dock of cylinder storage at Central Stores.

Building Service

Janitors finished cleaning windows in 761, 762, 704 and 701-B. This completes current round of window washing for 700 Area.

Steam Operation

At the beginning of the month, No. 2 boiler was in service, No. 1 in reserve, No. 3 undergoing major overhaul, and No. 4 awaiting stoker repair parts.

In order to carry the additional heating load, No. 1 boiler was also placed in service on September 28.

Stoker repairs having been completed, No. 4 boiler was placed in service on October 19 and No. 1 removed from the line, reverting to reserve status.

On October 22, a leaking tube in No. 2 boiler necessitated the removal of this unit from service, being replaced by No. 1 boiler; repairs were completed on No. 2 boiler several days later, returning this unit to a reserve status.

At the close of the month, Nos. 1 and 4 boilers were in service, No. 2 in reserve and No. 3 undergoing biennial major overhaul.

The quantity of steam generated at the 784 Plant was 10.7% greater than for the same period of the previous year.

On October 26, a representative from the Travelers Insurance Company inspected No. 2 boiler, No. 1 hydrogen-zeolite softener, and No. 2 sodium-zeolite softener. This completes the inspections of the boilers and water softeners at the 784 Plant for the current year.

Operation of the automatic oil-fired heating plant at Central Stores began on September 30.

Firing of the boilers at the 1131 Area heating plant during the night hours was also begun on September 30, with operator assistance provided by the Community Utilities Unit until October 10, following which date it was necessary to provide this service on an overtime basis with the Junior Power Operators from 784 Plant until October 27, when operation was no longer required at the 1131 Area.

Coal Consumed: 1,217.95 net tons.

Steam generated:	17,343.3 M. Lbs.
Steam leaving plant:	15,313.9 M. Lbs.
Steam delivered:	12,933.1 M. Lbs.
Total Water softened:	2,408,500 gallons
Total soft water sent to Kadlec Hospital:	115,110 gallons
Total soft water sent to 784 Heating Plant:	2,293,390 gallons

TELEPHONE SUB-SECTION

General

The heavy rain on the 20th of October disclosed several leaks in aerial cables and resulted in approximately 30 Richland telephones being out of order for periods ranging from a few hours to 48 hours.

During the month, a question arose as to whether the Kaiser Engineers should continue to operate the temporary manual telephone switchboard in the 100-K Area or whether the General Electric Telephone Sub-Section should take over its operation on November 1st. The A.E.C. Engineering and Construction Division directed that the board continue to be operated by the Kaiser Engineers until such time as they reached a point in their construction where it would be desirable for them to transfer responsibility for switchboard operation to General Electric. Interim operation of the manual switchboard is necessary until the 100-KBC dial exchange is completed in April, 1955.

The building under construction in the 700 Area for the new official exchange was approximately 78% complete as of October 22nd.

On October 20th, the Supervisor of Contracts received six bids on printing of the next three editions of a Plant telephone directory. The Columbia Basin News was low bidder with a price of $3330. Although the Columbia Basin News proposal varied on one respect from the specification in the matter of type to be used, the proposal appears to be satisfactory and it is expected that a recommendation will be sent to the A.E.C. within the next few days that they approve award of the job to the Columbia Basin News.

At the suggestion of the A.E.C. Engineering and Construction Division and upon request of the General Electric Engineering Department, a representative of the Telephone Sub-Section was sent to the Stromberg-Carlson Company in Rochester, New York, to expedite approval of equipment circuit drawings for the new Official exchange, Project CA-533.

Plant Telephone Operations

In the 100-K Area, the Construction Contractor-installed local telephone cable system was tested and inspected. Minor exceptions were noted by Telephone Sub-Section personnel and were cleared by construction forces. Where possible, temporary construction telephone circuits were rerouted through the permanent cable system in order to allow removal of temporary facilities.

Approximately 40 permanent telephones were installed in the 1704-K and 1720-K Buildings.

Technical assistance was given the Construction Contractor in balancing and loading the direct-burial trunk cable which will serve the new 100-KBC exchange. The installation of this trunk cable and the underground local cable between the 100-KBC exchange and the 100-B area is essentially complete.

Inspected, tested and tied-in the cable distribution system installed to serve the new consolidated Transportation facility, and moved approximately 45 telephones to the new location.

Located and cleared a fault in the T-1 trunk cable between Richland and North Richland. This fault was located near the drive-in theatre on Spengler Road and was caused by a bullet hole in the cable sheath.

Plant Telephone Operations (Contin.)

In conjunction with a plan to provide temporary service to 100-K operations from the temporary manual switchboard, conference jacks were arranged on the switchboard.

Modified and made additions to the ringing interrupters in the 200-EW and White Bluffs exchange to provide automatic transfer to Interrupter No. 2 when Interrupter No. 1 fails to function. This automatic feature replaces the manual control originally provided by the equipment vendor.

Met with Minor Construction and Design Engineering representatives to discuss cable installation for the 313 and 306 Buildings in the 300 Area. Prepared and issued Drawing TE-5-92354 to show the proposed additional cable.

Prepared Job Specifications P-55-7 to cover work required to remove approximately 500 feet of 51-pair lead covered cable and three terminals from the 200-W Area.

Prepared Job Specification P-55-5 to cover work required to tie-in cable and make pre-service test at the new Transportation facility.

Extended dial line A-4469 from the Classification Yards in Riverland to the Milwaukee Railroad station at Beverly. This extension was approved by the A.E.C. because of the need for convenient and direct telephone communication with the Milwaukee Railroad people at Beverly.

Commercial Telephone Operations

Engineered and prepared 10 jobs pertaining to outside Plant expansion and improvement.

Continued activities concerned with assisting Plant Accounting Personnel in setting up the F.C.C. Approved System of Uniform Accounts.

Installed 5 circuit adapters in the Richland exchange to be used for restricting certain Richland lines from calling Pasco and Kennewick long distance operators.

Continued work relating to gas pressurizing the pasco trunk cable and began similar work on the Kennewick trunk cable.

Performed four cable jobs to provide additional and improved service facilities in Richland.

Conducted an extensive inspection of the Richland outside Plant to determine preventive and corrective maintenance required, and to locate cases where TV cable installations are not according to specifications.

At the request of the Richland Electrical Unit, prepared an estimate of the cost of telephone cable plant re-arrangement that would be required if the intersection of Stevens and Williams streets were widened.

Prepared engineering information required for expanding and improving telephone service at the Richland Central Fire Station.

Prepared an estimate of the cost that would be involved in moving the Kadlec Hospital PBX switchboard to the 702 Building.

Radio System Operations

Installed a radio station at Riverland at the roundhouse office to operate as a part of network KEB686. This station was installed because of relocation of railroad dispatcher to the new Transportation building in North Richland.

Installed public address and sound recording equipment in the Jason Lee School and made recording of the Company meetings held there on September 28th and 30th.

Installed public address and sound recording equipment in the Carmichael Junior High School and made a recording of the Company meeting held there on September 30.

Relocated the radio station equipment at the Richland barricade in conjunction with remodeling of the barricade office.

Recorded the Science Forum programs on September 29th and October 6th.

Installed tape recording equipment and made recording of the A.E.C. auction sale held on October 11th and 12th.

Installed radio station in the radio room of the 1720-K Building.

Two additional mobile radio transmitter-receiver units were installed and placed in service for the Railroad Operations Unit.

Two additional mobile transmitter-receiver units were installed and placed in service on the frequency used by Security Patrol; one unit was for Plant Fire Protection and the other for Regional Survey Unit of the Biophysics Section.

Radio Service Interruptions:

1. Station KKE 624 #1 (Richland Barricade) was out of service from 9:30 AM to 10:30 AM, October 18th due to tube failure.

2. Station KKE 624 (703 Building) was out of service from 4:20 AM to 5:29 AM, October 19th due to tube failure.

3. Station KKE 624 #15 (Army Post #210) was out of service from 2PM to 4 PM, October 20th due to a burned out power supply.

Statistical Data

	At 20th of October	Change From Previous Month	Change From Year Ago
Residential Subscribers	6063	+ 17	+ 370
Business Subscribers	488	- 2	+ 1
Paystation Telephones	70	+ 2	+ 4
Official Subscribers:			
Richland Exchange	988	- 1	+ 1
North Richland Exchange	240	- 5	- 12
Process Area Exchanges	1813	+ 10	+ 141
		+ 21	+ 505

Backlog of Service Requests:

		Total
For New Residential Telephones	261	
For New Business Telephones	2	263
For Residential Outside Moves	25	
For Business Outside Moves	0	25

Service Orders Processed:

In Connection with Residential and Business Service	377
In Connection with Official Service	434
TOTAL	811

Facilities - Installed, In Service and Available:

	Exchange Lines			Party Lines
	Installed	In Service	Available	Available
Richland	4050	3881	59	334
North Richland	600	449	151	76
Process Areas	2050	1710	340	--
	6700	6150	550	410

Radio Stations:

	At 20th of October	Change from Previous Month	Change from Year Ago
Fixed Stations	35	0	+ 17
Mobile Stations	153	+ 3	+ 11
	188	+ 3	+ 28

SECURITY AND PATROL SUB-SECTION

Document Report

Number of classified documents and prints unaccounted for as of October 1: 349
(121 of the above 349 documents are chargeable to E. I. du Pont de Nemours & Co.)

Number of classified documents and prints reported as unaccounted for during October, 1954: 1

Number of classified documents and prints either recovered or downgraded during October, 1954: (One located, one downgraded) 2
(The document which was located is chargeable to E. I. du Pont de Nemours & Co.)

Number of classified documents and prints remaining unaccounted for as of November 1, 1954: 348

Security and Patrol (Contin.)

The Non-Technical Document Review Board held three meetings during October, and reviewed a total of 98 documents. Of this number

61 were downgraded to "Official Use Only",
17 were declassified,
17 had their classification retained,
1 was not within the scope of the Board, and
2 were referred to the Coordinating Organization Director.

Security Education

Three security articles appeared in the GE NEWS during the month.

There were 320 security meetings held and attended by 5,021 employees of the General Electric Company. A representative of the Security and Patrol Unit showed one of the security films at some of these meetings as indicated below:

"Turn Left Across the Bridge" the new film just released during this reporting period, was shown at two meetings, each with an average attendance of 20 employees.

"Words Are Weapons" was shown at six meetings, each with an average attendance of 20 people.

"The Calculated Risk" was shown at two meetings, each with an average attendance of 15 people.

"The Tallest Shadow" was shown at two meetings, each with an average attendance of 30 employees.

"Signal 99" was shown at two meetings, each with an average attendance of eight people.

"Only the River" was shown at one meeting with 51 employees present.

"The Man on the Left" was shown at one meeting with 50 people present.

GE Security Bulletin No. 87, entitled "Security Under Public Law 703" was issued on October 6, 1954.

On October 19, a memorandum was issued to supervision regarding the opening of 201-C Exclusion Area (Hot Semi Works), 200-E Area, as an Exclusion Area effective November 1, 1954, and making requests for area clearance of employees.

On October 25, a memorandum was issued to supervision regarding the transfer of the 105-KW Building, 100-K Area, from Construction to the Manufacturing Department during November and the making of requests for area clearance of employees.

The following security posters were distributed and posted in the plant areas during the reporting period:

100 copies of the poster furnished by the Department of Defense, Washington, D.C., bearing the slogan "Caution".

1,100 copies of the security pamphlet also furnished by the Department of Defense bearing the same slogan.

Security and Patrol (Contin.)

There 151 employees of the General Electric Company who received a "Q" security orientation talk from either a representative of the Security Unit or a Security Patrol Supervisor during the month of October.

Statistical Report of Security Patrol Activities:

	100-B	100-D	100-F	100-H	100-K	200-W	300
Pat Searches	87	87	49	20	0	0	0
Escorts	5	9	7	19	16	28	69
Ambulance runs	1	0	2	1	0	2	14
Passes issued:							
One day temporary	73	9	11	6	13	45	99
Travel	0	0	0	0	0	0	134
Red Tag	153	115	23	46	0	449	105
Telephonic	0	0	0	0	1	0	16
Supervisors' Post Contacts	413	263	258	261	100	702	433

Other Security Patrol Activities (Computed by hours): 300 & 700

Security File Check	166	260.5	174.1*	450.6	422	528	1,334
Building Check	311	29		30.5	418	528	696

* In the 100-F Area, the Security File Check and Building Check are combined into one figure.

Arrest Report

Violations	Number of Violations	Cases Cleared	Pending	Fined	Jailed
Negligent Driving	1	1	0	1	1
Illegal Passing	1	1	0	1	0
No Driver's License	2	1	1	1	0
Speeding	1	0	1	0	0
Total	5	3	2	3	1

Citation Tickets issued: 5
Warning Tickets issued: 13

Security Patrol Training Activities:

192 Security Patrolmen received firearms training during October.
100 Security Patrolmen received classroom instruction during the same period.

Training courses were as follows:

Safety Class	1/2 hour
Security Class	1/2 hour
Operations Class	1 hour

Security and Patrol (Contin)

The Security Patrol In-Training system was revised in order to combine patrol training with round table and information type meetings. The new procedure places more responsibility on Patrol Duty Captains and Shift Lieutenants, thereby permitting the reduction of one training lieutenant. Another advantage is that the training and information sessions can be held on the Number One and Number Three shifts and on weekends when Patrol business is slack.

Security Patrol Post Changes

There were no posts discontinued during October. There were no new posts established during this period; however, the Purex Control Room, 200-E Area, began operation by Patrol on the day and swing shifts effective October 11. On October 27, this Control Room went onto operation by patrol on all three shifts.

General

Special classified scrap bags that had been on order several months were received and placed in Stores as a store stock item. Use of the special bags should prevent the inadvertent destruction of formally issued classified documents.

The old 300 Area Badge House was fenced out of the 300 Area proper on October 12 and is not used as a radiation monitoring station.

On October 13, 1954, lighted signs 24 x 5 feet were installed over the Richland, Prosser, and Yakima Barricades listing entrance instructions and designating the entire plant area as a radiation controlled area.

A survey was made of personnel cleared for category III "Combined Operations" Top Secret clearance, and as a result the list was reduced approximately 50%.

Security Administration

Daily Badge Log Entries	2,787
"Q" clearances	151
Formal "P" clearance issued	34
"P" Approval Clearances issued	40
Category Access granted	75
Category Access withdrawn	62
Category Access reviewed and revised	41
Photo passes laminated and issued	153
"A" badges assembled & distributed to areas	440
"A" badges received from areas	325
"A" badges received from areas for repair	76

Rephotographing Program

Number of "A" badges	29
Number of "B" badges	97
Photos for Passes	27
Number of persons rephotographed	264
	417

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HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING OCTOBER 31, 1954

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - ADVANCE ENGINEERING SECTION							
I. Visits to other Installations							
R. M. Fryar to: Brookhaven National Lab. Upton, Long Island, New York	Attend heat transfer meeting	O. E. Dwyer	10-18-54	10-19-54	X		
P. F. Gast to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend Reactor Physics Planning symposium on fission physics	D. D. Cowen	10-11-54	10-17-54	X		
P. F. Gast to: General Electric Co. Schenectady, New York	Consultation on Army Packaged Power Plant Proposal	H. Grantz	10-22-54	10-29-54	X		
W. R. Lewis to: General Electric Co. Schenectady, New York	Consultation on Army Packaged Power Plant Proposal	H. Grantz	10-4-54	11-1-54	X		
J. R. Triplett to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend symposium on fission physics and classified nuclear physics for reactors	D. D. Cowen	10-11-54	10-17-54	X		
W. K. Woods to: U. S. Atomic Energy Comm. Washington, D. C.	Attend meeting on special evaluation committee	G. Kolstad L. Squires	10-4-54	10-6-54	X		
W. K. Woods to: Carbide and Carbon Oak Ridge, Tennessee	Attend meeting of editors of JRST and information on centrifuge committee	W. H. Sullivan G. Garrett J. Schacter	10-19-54	10-23-54	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							
I. Visitors to this Works							
B. M. Fry U. S. Atomic Energy Comm. Washington, D. C.	Discuss problems of technical information service program	C. G. Stevenson	10-4-54	10-4-54	X		300-3760
A. F. Owings U. S. Atomic Energy Comm. Washington, D. C.	Discussion on reactor handbook	C. G. Stevenson	10-11-54	10-12-54	X		300-3760
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visits to other Installations							
A. J. Karnie to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Determine facilities and design for shipping and handling "N" slugs	J. Urban C. Wagner	10-11-54	10-12-54	X		
R. J. Bursey, Jr. to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Determine facilities and design for shipping and handling of "N" slugs	J. Urban C. Wagner	10-11-54	10-12-54	X		
E. B. LaVelle to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Attend AEC Welding Committee meeting	A. E. Focke M. Pugacsz	10-28-54	10-29-54	X		
W. L. Pearl to: Naval Research Lab. Washington, D. C.	Attend Carbon Steel Committee meeting	J. A. Ambrose	10-12-54	10-12-54	X		
ENGINEERING DEPARTMENT - TECHNICAL SECTION							
I. Visitors to this Works							
R. D. Brooks General Electric Company Schenectady, New York	Discuss personnel matters	M. W. Carbon	10-27-54	10-28-54		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. H. Cornell Knolls Atomic Power Lab. Schenectady, New York	Discuss irradiation facilities on KAPL-120	J. A. Berberet	10-20-54	10-21-54	X		100-H 105 300-L XXX 700
R. W. Coyle Aircraft Nuclear Propulsion Cincinnati, Ohio	Discuss available radiation facilities	J. A. Berberet	10-8-54	10-8-54	X		100-H 105 105-KW 100-B 105-B 300-L XXX; 700
R. C. Feber, Jr. Knolls Atomic Power Lab. Schenectady, New York	Consultation on Redox	F. W. Woodfield	10-4-54	10-8-54	X		200-E XXX 200-W Redox 300-L XXX; 700
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile loop facilities	G. E. Wade	10-4-54	10-5-54	X		100-D XXX 100-H 105 300-L XXX; 700
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss irradiation facilities on KAPL-120	J. A. Berberet	10-20-54	10-21-54	X		100-H 105 300-L XXX 700
B. W. Gonser Battelle Memorial Institute Columbus, Ohio	Metallurgical consultation	L. D. Turner	10-20-54	10-20-54	X		300-L XXX
K. J. Krystyan Knolls Atomic Power Lab. Schenectady, New York	Discuss irradiation facilities on KAPL-120	J. A. Berberet	10-20-54	10-21-54	X		100-H 105 300-L XXX 700
E. Lamb Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss specifications for CO and BE into canned for radiation at HOO	J. A. Berberet V. R. Cooper	10-18-54	10-19-54	X		105-KW 100-H 105 300-L XXX 200-W Redox, 221-U
R. R. Lee Aircraft Nuclear Propulsion Cincinnati, Ohio	Discuss available radiation facilities	J. A. Berberet	10-8-54	10-8-54	X		100-H 105 105-KW 100-B 105-B 300-L XXX; 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
G. Murphy Ames Laboratory Ames, Iowa	Discuss fuel element technology	J. W. Riches	10-12-54	10-14-54	X		100-B 105-B,105-C 300-303 700
R. T. Othmer Ames Laboratory Ames, Iowa	Discuss fuel element technology	J. W. Riches	10-12-54	10-14-54	X		100-B 105-B, 105-C 300-303 700
E. W. Powell Carbide and Carbon Paducah, Kentucky	Discuss oxide shipping	V. R. Chapman	10-28-54	10-29-54	X		200-W 221-U, Redox 300-L 303
W. J. Ramsey Radiation Laboratory Livermore, California	Discuss chemical fabrication problems	F. W. Albaugh O. J. Wick	10-12-54	10-12-54	X		200-W 234, 235 300-L XXX
K. Street, Jr. Radiation Laboratory Livermore, California	Discuss chemical fabrication problems	F. W. Albaugh O. J. Wick	10-12-54	10-12-54	X		200-W 234, 235 300-L XXX
W. H. Sullivan Oak Ridge National Lab. Oak Ridge, Tennessee	Journal of reactor and technical science	O. H. Greager	10-10-54	10-12-54	X		300-L 303
D. M. Wilsey All States Employee Schenectady, New York	Work on in-pile water loop	G. E. Wade	8-31-54	12-31-54	X		100-D XXX 100-H 105 300-XXX; 700 100-F XXX 105-KW 100-B 105-B, 105-C
II. Visits to other Installations							
F. W. Albaugh to: Battelle Memorial Inst. Columbus, Ohio	Discuss fuel element development program	H. R. Nelson	10-18-54	10-18-54	X		
J. A. Berberet to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Discuss proposed ANP irradiations	R. R. Lee R. W. Coyle	10-25-54	10-26-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
T. K. Bierlein Battelle Memorial Inst. Columbus, Ohio	Attend AEC Metallographic Committee Meeting	H. A. Saller	10-27-54	10-28-54	X		
T.K. Bierlein to: Argonne National Lab. Lemont, Illinois	Discuss cathodic vacuum etching and electron microscopy	J. E. Baumrucker	10-29-54	10-29-54	X		
M. W. Carton to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Heat Transfer Meeting	O. E. Dwyer	10-18-54	10-20-54	X		
W. H. Clark to: Aricraft Nuclear Propulsion Cincinnati, Ohio	Discuss proposed ANP irradiations	R. R. Lee	10-25-54	10-26-54	X		
E. D. Clayton to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics conference	J. L. Fowler	10-13-54	10-15-54	X		
D. E. Davenport to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics Conference and discuss critical mass problems at K-25	J. L. Fowler	10-13-54	10-15-54	X		
		D. Callihan	10-13-54	10-15-54	X		
D. E. Davenport to: Brookhaven National Lab. Upton, Long Island, New York	Discuss exponential measurements	J. Chernick K. Downes	10-18-54	10-20-54	X		
M. V. Davis to: Argonne National Lab. Lemont, Illinois	Discuss reactivity measurements	C. V. Muelhouse W. C. Redman	10-11-54	10-12-54	X		
M. V. Davis to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics symposium	D. D. Cowan	10-13-54	10-15-54	X		
W. F. Ekern to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Heat Transfer meeting	O. E. Dwyer	10-18-54	10-20-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
E. A. Evans to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss coatings and corrosion problems	T. Evans	10-18-54	10-19-54	X		
E. A. Evans to: Battelle Memorial Inst. Columbus, Ohio	Discuss coatings and corrosion problems	H. R. Nelson	10-20-54	10-22-54	X		
T. W. Evans to: Phillips Petroleum Co. Idaho Falls, Idaho	Discuss Hanford slug irradiations	R. J. Nertney	10-5-54	10-7-54	X		
W. D. Gilbert to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Heat Transfer meeting	O. E. Dwyer	10-18-54	10-20-54	X		
R. O. Gumprecht to: Argonne National Lab. Lemont, Illinois	Consultation on long term reactivity gains	J. West	10-11-54	10-12-54	X		
R. O. Gumprecht to: Oak Ridge National Lab. Oak Ridge, Tennessee	Present paper at ORNL Reactor Physics Conference	J. L. Fowler	10-13-54	10-15-54	X		
L. A. Hartcorn to: Battelle Memorial Inst. Columbus, Ohio	Attend AEC Meallographic Committee meeting	H. A. Saller	10-27-54	10-28-54	X		
R. E. Heineman to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics symposium	D. Callihan	10-12-54	10-15-54	X		
D. C. Kaulitz to: Phillips Petroleum Co. Idaho Falls, Idaho	Discuss Hanford slug irradiations	R. J. Nertney	10-5-54	10-7-54	X		
D. D. Lanning to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss critical mass problems and attend Reactor Physics conference	D. Callihan	10-12-54	10-15-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. D. Lanning to: Knolls Atomic Power Lab. Schenectady, New York	Discuss operation of small reactors	W. R. Kanne	10-18-54	10-22-54	X		
F. J. Leitz, Jr. to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend Thorex Information meeting	F. L. Culler	10-19-54	10-20-54	X		
B. R. Leonard, Jr. to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss cross section measurements and attend reactor physics symposium	H. Pomerance R. Stoughton	10-12-54	10-15-54	X		
B. R. Leonard, Jr. to: Argonne National Lab. Lemont, Illinois	Discuss neutron diffraction spectrometer and cross section measurements	S. S. Sidhu	10-18-54	10-18-54	X		
G. E. McCullough to: National Lead Company Fernald, Ohio	Discuss fuel element technology	G. Wunder	10-13-54	10-14-54	X		
G. E. McCullough to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Discuss fuel element technology	C. D. Harrington	10-15-54	10-15-54	X		
H. Neumann to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics Symposium	D. Callihan	10-12-54	10-15-54	X		
W. E. Niemuth to: Argonne National Lab. Lemont, Illinois	Discuss reactivity measurements	C. V. Muelhouse W. C. Redman	10-11-54	10-12-54	X		
W. E. Niemuth to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend reactor physics symposium	D. D. Cowan	10-13-54	10-15-54	X		
W. J. Ozeroff to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics symposium	D. Callihan	10-12-54	10-15-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class	Restricted Data Unclass	Areas
F. B. Quinlan to: National Lead Company Fernald, Ohio	Consultation on electronic equipment	C. Konkle J. T. Scheuer	10-4-54	10-8-54	X		
O. W. Rathbun to: National Lead Company Fernald, Ohio	Observe fabrication of uranium	J. M. Ciborski	10-11-54	10-15-54	X		
C. R. Richey to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics Conference	J. L. Fowler	10-13-54	10-15-54	X		
R. J. Sloat to: Oak Ridge National Lab. Oak Ridge, Tennessee	Separations process consultation	F. L. Culler H. K. Jackson	10-18-54	10-22-54	X		
R. J. Sloat to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Separations process consultation	C. D. Harrington W. M. Leaders	10-21-54	10-22-54	X		
W. R. Smith to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Discuss development of of corrosion resistant stainless steel alloys, titanium	A. E. Focke	10-28-54	10-29-54	X		
G. W. Stuart, Jr. to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics symposium	D. Callihan	10-12-54	10-15-54	X		
W. P. Wallace to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Liaison on fuel technology programs, aluminum quality, zirconium can, tube fabrication	T. C. Evans	10-18-54	10-19-54	X		
W. P. Wallace to: Bridgeport Brass Co. Bridgeport, Connecticut	Liaison on fuel technology programs, aluminum quality, zirconium can, tube fabrication	R. S. French	10-21-54	10-21-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
A. T. Taylor to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Liaison on fuel technology programs, aluminum quality, zirconium can, tube fabrication	T. C. Evans	10-18-54	10-19-54	X		
A. T. Taylor to: Bridgeport Brass Co. Bridgeport, Connecticut	Liaison on fuel technology programs, aluminum quality, zirconium can, tube fabrication	R. S. French	10-21-54	10-21-54	X		
F. W. Woodfield to: Oak Ridge National Lab. Oak Ridge, Tennessee	Separations process consultation	F. L. Culler H. K. Jackson	10-18-54	10-22-54	X		
F. W. Woodfield to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Separations process consultation	C. D. Harrington W. M. Leaders	10-21-54	10-22-54	X		
R. W. Woodruff to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend ORNL Reactor Physics symposium	D. Callihan	10-12-54	10-15-54	X		
D. C. Worlton to: National Lead Company Fernald, Ohio	Consultation on electronic equipment	C. Konkle J. T. Scheuer	10-4-54	10-8-54	X		

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

I. Visits to Other Installations

G. L. Brown, Jr. to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Attend AEC Industrial Information committee meeting	E. J. Brunenkant	10-5-54	10-8-54	X		
D. W. McLenegan to: Los Alamos Scientific Lab Los Alamos, New Mexico	Conference on scientific and education problems	W. H. Crew	10-7-54	10-9-54	X		
W. A. Watts to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Attend AEC Industrial Information committee meeting	E. J. Brunenkant	10-5-54	10-8-54	X		

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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							
R. D. McCrosky E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Fuel slug canning operation	E. W. O'Rorke E. A. Smith	10-27-54	11-12-54	X	300-303	
II. Visits to other Installations							
W. M. Mathis to: National Lead Company Fernald, Ohio	Discuss with Metallurgical Committee on fuel elements	G. W. Wunder	10-13-54	10-14-54	X		
W. M. Mathis to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Discuss with Metallurgical Committee on fuel elements	C. D. Harrington	10-15-54	10-15-54	X		
R. C. Schilling to: General Engineering Lab. Schenectady, New York	Discuss development of in-pile reactor process tube thickness gauge	J. L. Michaelson	10-4-54	10-5-54	X		
OPERATIONS ANALYSIS STUDIES GROUP							
I. Visits to other Installations							
P. M. Thompson to: Aircraft Gas Turbine Cincinnati, Ohio	Test linear programming computing techniques on type 702 computer	H. J. R. Grosch D. Snell	10-25-54	11-5-54	X		
P. M. Thompson to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Information on programming techniques relative Operations Branch	J. W. Darley	10-27-54	11-5-54	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							

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[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class	Restricted Data Unclass	Areas
G. V. Beard U. S. Atomic Energy Comm. Idaho Falls, Idaho	Discuss problems in area contamination	H. M. Parker	10-25-54	10-26-54	X	700	
II. Visits to other Installations							
R. Borasky to: Argonne National Lab. Lemont, Illinois	Discuss biological applications of the electron microscope	L. E. Ruth	10-11-54	10-13-54		X	
W. C. Roesch to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend symposium on fission physics and classified nuclear physics	K. Z. Morgan	10-12-54	10-15-54	X		
W. C. Roesch to: Argonne National Lab. Lemont, Illinois	Confer on radiation measurements	R. K. Swank	10-18-54	10-19-54	X		

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RADIOLOGICAL SCIENCES DEPARTMENT

OCTOBER 1954

Nineteen informal, 5 Class I and 2 Class II radiation incidents were recorded.

The extent of ruthenium contamination was generally unchanged. The treatment of the whole reservation as a radiation control area was begun, to the accompaniment of an apathetic reaction by the public.

Particle showers, presumably of foreign origin, occurred throughout the Pacific Northwest.

In research and development emphasis continued on the ruthenium problems. More definitive work on the MPC of Ru^{106} in drinking water confirmed that the present "official" value is about 40 times too high. Faster methods of particle detection, separation and analysis were developed. Preliminary estimates of particle pick-up from the ground were made and used to develop logical proposals for work access of various categories.

RADIOLOGICAL SCIENCES DEPARTMENT

OCTOBER 1954

Organization

The month-end force of 385 included 38 supervisors, 88 engineers and scientists, 21 clerical, and 238 other personnel.

Number of Employees on Payroll	
Beginning of Month	374
End of Month	385
Net Increase	11

General

There were 19 informal, 5 Class I and 2 Class II radiation incidents. None was of major significance.

There was no appreciable change in the ruthenium particle contamination situation. The control of the entire reservation by signs restricting travel to roads and by closure of some roads, except under special permit, was begun. The reaction of the public to this announcement was gratifyingly apathetic. The major efforts in many phases of the research and development studies continued to be directed toward prompt solution of some of the pressing ruthenium hazard problems. This involves an obviously necessary departure from budget plans.

The long awaited NCRP report Handbook 59 - Permissible Dose from External Sources of Ionizing Radiation became available. A revised manual of radiation protection standards factoring in a desirable interpretation of the new recommendations is almost completed.

Fifteen suggestions were submitted by department employees. This is believed to be an all-time record.

An important contribution to the earth sciences program has been made by Dr. Theis, U.S.G.S. who visited the site in July and has submitted a provocative and stimulating appraisal of the local studies. Further contacts with this consultant are planned.

Partly due to the urgent and unforeseen demands of the particle problem, overtime forecasting has been deplorable for the past two months. With temporary stabilization of the program this problem is being vigorously attacked. Research and development expenditures are also running precariously close to budget limits. The tighter squeeze is occurring in Biophysics, which has made such substantial advances under its present section management that curtailment of program would be catastrophic.

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Radiological Sciences Department

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
none	none

RADIOLOGICAL ENGINEERING

Construction work was started on additional facilities for particle inhalation studies for animals.

Radiological Engineering consultation subjects included methods for fission product calibration of gamma spectrometers for reactor effluent monitoring, scope of a central facility for uranium stream decontamination; radiological requirements of B Plant reactivation; and waste disposal considerations for the KE test recirculation facility.

Production scavenging of TBP waste was started; the settled supernate activity levels were of the order expected and ground disposal of the first batch was approved. The T Plant first cycle scavenging production test was started; samples were obtained for laboratory testing to determine safe disposal criteria.

Special tests were proposed and started in cooperation with the Reactor Section to evaluate the additional hazards of reactor effluent containing purge material and to determine adequate disposal criteria.

Initial experiments to determine the probability of transfer of ground deposited particles to man indicated one transfer per 25 exposure hours when the ground contamination was one particle per square foot; the conditions of the test were believed to over-estimate the actual transfer probability. A temporary isokinetic sampler for the Redox stack breeching was designed, and operating specifications were developed; installation was completed, and it was expected that this apparatus would adequately detect particles at this point in the system.

Radiological Sciences Department

RADIOLOGICAL RECORDS AND STANDARDS

Radiation Monitoring Unit

General Statistics

	September	October	1954 to Date
Special Work Permits	495	493	5,364
Routine and Special Surveys	1,470	1,802	15,941
Air Samples	1,310	1,633	14,663
Skin Contamination	14	13	168

A scintillation beta-gamma doorway monitor was constructed by the Instrument Development group of the Biophysics Section and was installed at the 200-W gatehouse to check personnel for particle contamination. One particle was discovered in about 1500 individual personnel checks.

Preliminary experiments on the reclaiming of leather gloves by dry-cleaning gave encouraging results. It is estimated that a reclaiming operation will cost 20 to 30 cents per pair as compared to the purchase price of $1.30 for new gloves. Other work on protective clothing included a review of protective clothing specifications, testing of washing procedures of the 200-W Laundry, and the purchase of high-top shoe covers for a plant-wide field test.

Radiological Standards

Radiation Incidents

Type	September	October	1954 to Date
Informal	21	19	232
Class I	5	5	62
Class II	2	2	17

The two Class II incidents involved technical overexposures resulting from work at the 105-H Reactor and in the Redox Canyon. Both were due primarily to inadequate timekeeping. The Class I incidents included unplanned radiation exposure at the 105-B Reactor and at the T-Plant Canyon, the dropping of a radium source at the Calibrations Building, failure of a mechanic to wear personnel meters while working in a high level radiation field at the 105-H Reactor*, and exposure to uranium

*There is some confusion as to classification of such incidents. All incidents involving failure to wear personnel meters are automatically Class I or higher, due to the importance attached to personnel exposure records. This will be clarified in the revised standards.

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Radiological Sciences Department

Radiological Standards (continued)

oxide fumes during a fire in research facilities at the 314 Building. One of the informal incidents reported involved overheating of two rows of process tubes at the 105-H Reactor during a shut-down to remove a ruptured slug.

The use, storage, and marking of protective clothing for contamination control were investigated. About 50% of the coveralls and 95% of the lab coats examined were found to be improperly marked. Results of the study were circulated to appropriate supervision.

Exposure Records

a. Personnel Meters, and Records and Photometry

During the first nine months of 1954, 188 G. E. employees and 13 other employees showed an accumulated whole body gamma exposure in excess of 1 roentgen. Twenty-nine of the G. E. cases were above 2 roentgens and three were above 3 roentgens. One hundred thirty-eight G. E. employees and eight other employees showed a whole body beta-plus-gamma exposure in excess of 2 rads. Three of the G. E. exposures were above 4 rads.

General Statistics

	September	October	1954 to Date
Gamma Pencils read	235,708	235,986	2,273,028
Potential overexposures	11	12	119
Confirmed overexposures	0	2	2
Slow neutron pencils read	1,612	1,222	12,490
Potential overexposures	1	2	4
Confirmed overexposures	0	0	0
Beta-Gamma film badges processed	41,034	39,382	378,378
Potential overexposures	22	30	509
Confirmed overexposures	0	2	3
Fast neutron badges processed	805	618	5,021
Potential overexposures	1	0	5*
Confirmed overexposures	0	0	1
Lost readings (all causes)	70	111	1,866

*Corrected Total

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b. Bioassay

1. Plutonium Analyses

	September	October	1954 to Date
Samples assayed	736	776	7,451
Results above detection limit*	25	17	240
Resamples Assayed	35	41	359
Results above detection limit*	19	16	115
Maximum d/m/sample	1.33	1.26	2.60

*Detection limit was 0.05 d/m.

2. Fission Product Analyses

	September	October	1954 to Date
Samples assayed	928	839	8,267
Results above 10 c/m/sample	6	1	69

The one result above 10 c/m did not indicate significant body deposition.

3. Uranium Analyses

Results of 414 samples processed this month are tabulated below. This brings the total number of samples processed in 1954 to 2966.

	Following Exposure /ug/liter			Following Period of No Exposure /ug/ liter		
Sample Descr.	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Metal Preparation	61.7	4.6	128	35.6	3.8	76
Technical	86.6	16.5	33	19.8	17.3	2
UO_3 Plant	116.6	12.6	71	68.0	7.9	54
Special Incidents	24.8	8.6	34	14.1	6.2	9

The high results at the UO_3 Plant are under investigation.

Radiological Sciences Department

Bioassay (continued)

4. Tritium Analyses

	Activity Density ($\mu c/cc \times 10^3$)						
	0-5	5-10	10-35	35-70	>70	Total	1954 To Date
Number of Samples	2	2	2	0	0	6	1913

c. Thyroid Checks

All thyroid checks reported were below the warning level.

d. Hand Score Summary

There were 37,112 alpha and 66,789 beta scores reported. About 0.003% of the alpha and 0.012% of the beta scores were above the warning level. Decontamination of all reported high cases was attempted and successful.

Calibrations

Special calibrations were performed on a prototype CP meter designed for field beta measurements, the Jordan Radector, modified nuclear GM meters, prototype CP meters for the 100-K Area, and slow neutron pencils for the 100-K Area.

	Number of Routine Calibrations		
	September	October	1954 to Date
Fixed Instruments	113	80	778
Portable Instruments	3,665	3,984	33,988*
Personnel Meters	15,784	14,194	154,942*
Total	19,562	18,258	189,708

*Corrected Totals

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Radiological Sciences Department

BIOPHYSICS

Regional Radiation Measurements

Regional Monitoring

The general findings are summarized in the following table:

Sample Type and Locations	Activity Type	Average Activity Density /uc/cc	Trend* Factor
Drinking Water and Related Materials			
Benton City Water Co. Well	alpha	1.1×10^{-8}	--
Richland, N. Richland, Benton City Wells	alpha	$(<0.5 \text{ to } 7.3) \times 10^{-8}$	+8**
100 Areas	beta	$(<0.5 \text{ to } 7.4) \times 10^{-7}$	+2
Pasco, Kennewick, McNary Dam	beta	$(<0.005 \text{ to } 4.3) \times 10^{-7}$	+2
Backwash Solids - Pasco Filter Plant	beta	1.9×10^{-2} /uc/g	--
Backwash Liquids - Pasco Filter Plant	beta	$(0.06 \text{ to } 5.2) \times 10^{-5}$	+13
Sand Filter - Pasco Filter Plant	beta	2.8×10^{-4}	+3
Anthracite Filter - Pasco Filter Plant	beta	1.1×10^{-6}	--
Other Waters and Related Materials			
300 Area Wells #1, 2, 3	alpha	No sample	--
300 Area Well #4	alpha	No sample	--
Well #4 measured as uranium	U	No sample	--
Other Wells on the reservation	beta	$(<0.5 \text{ to } 8.4) \times 10^{-7}$	--
Columbia River - Hanford Ferry	beta	1.5×10^{-5}	--
Columbia River - below reactors	beta	1.6×10^{-5}	+2
Columbia River - Patterson to McNary	beta	4.5×10^{-7}	--
Columbia River - shore mud	beta	$(0.3 \text{ to } 1.3) \times 10^{-4}$ /uc/g	--
Raw water - Operating Areas	beta	$(<0.05 \text{ to } 2) \times 10^{-6}$	+2
Reactor Effluent Retention Basins to River	beta	12,000 to 20,000 /uc/sec/reactor $(4.3 \text{ to } 6.6) \times 10^{-3}$	--
Reactor Effluent Retention Basins to River	alpha	<0.03 /uc/sec/reactor $<5 \times 10^{-9}$	--
I^{131} in farm wastes to river	I^{131}	70 /uc/day 1.5×10^{-6}	--
I^{131} in Columbia River - Hanford	I^{131}	1.3×10^{-7}	--

Radiological Sciences Department

Regional Monitoring (continued)

Sample Type and Locations	Activity Type	Average Activity Density µc/cc	Trend* Factor
Atmospheric Pollution			
Gross Alpha Emitters	alpha	($<$4 to 8) x 10^{-15}	--
Gross Dose Rate - Separations Areas	beta-gamma	0.8 to 7.5 mrads/day	+2
Gross Dose Rate - Residential Areas	beta-gamma	0.4 to 0.9 mrad/day	--
Active Particles - Separations Areas	beta	(0.7 to 1.1) x 10^{-12}	+2
I^{131} Separations Areas	I^{131}	($<$0.4 to 4.4) x 10^{-13}	--
I^{131} Separations Stacks	I^{131}	$<$1.05 curies/day	-2
Ruthenium - Separations Stacks	$Ru^{103,106}$	$<$0.01 curie/day	-6
Rare Earths + Yttrium - Separations Stacks	beta-gamma	No samples	--
Active Particles - Wash., Idaho, Ore., Mont.	--	0.03 to 0.28 ptle/m^3	--
Active Particles - HAPO	--	0.02 to 0.20 ptle/m^3	--
Tritium (as oxides) - Reactor Stacks	T	1.05 curies/day	--
Vegetation			
Environs of Separations Areas	I^{131}	5 x 10^{-6} µc/g	--
Residential Areas	I^{131}	3 x 10^{-6} µc/g	--
Eastern Washington and Oregon	I^{131}	3 x 10^{-6} µc/g	--
Non-Volatile Beta Emitters - Wash. and Ore.	beta	(3.5 to 4.3)x10^{-5} µc/g	--
Alpha Emitters - Separations Areas	alpha	1.9 x 10^{-7} µc/g	--
Alpha Emitters - 300 Area	alpha	1.9 x 10^{-7} µc/g	+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.

**Trend factor applies to maximum value only. This maximum value is influenced by one possibly erroneous value based on a sample collected from a North Richland well on September 30 and not confirmed by re-sample and analysis. All other values from this well and others were comparable with last month's values.

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Radiological Sciences Department

Regional Monitoring (continued)

Airborne radioactive particles were observed at Pacific Northwest stations on September 28, October 7, and October 12, with maximum daily concentrations ranging from 100 to 1500 particles per 1000 cubic meters.

Ground contamination surveys on and near the project showed concentrations of radioactive particles ranging from greater than 1 per 10 square feet near Redox to 1 per 1300 square feet in Richland. Isolated particles were found at Connell and Mesa. Maximum dose rate of an individual particle measured in Richland was 550 mrads/hr and at Connell 40 mrads/ hr.

Installation of isokinetic sampling equipment was completed in the stack breeching at Redox on October 28.

Radio-Analysis Laboratory

Two-hundred ninety-two radioactive particles, with dose rates ranging from 250 mrads/hr to 65 rads/hr (CP meter readings), were separated from prevalent ground contamination for biological studies. The activity of particles found on deposition screens by Radiation Monitoring personnel on October 21 and again on October 27 was found to consist mostly of ruthenium-rhodium isotopes with less than 5% from zirconium, niobium, strontium and rare earths. Iron was found in the inert material but no ammonium nitrate could be detected in the particles which consisted of amber colored material with black and red small particles occluded. A study of particulate material in T-plant gaseous effluent revealed activity of this material, emitted daily, to be as high as 50 mc consisting of mixed fission products including 1-5 mc daily of $Sr^{89,90}$ isotopes.

Radiation Measurement Evaluation

Studies of ground contamination near the 200-W area were made to evaluate particle frequencies and distribution of dose rates. It was found that 50% of those particles with dose rates greater than 5 mrads/hr had dose rates above 50 mrads/hr and 10% had dose rates greater than 200 mrads/hr. If the general validity of this statement could be established, and if dose rates below 5 mrads/hr could be considered insignificant, this would greatly simplify survey work by confining the search to the easily found particles reading 50 mrads/hr or more and multiplying the answer by 2.

Synoptic Meteorology

Type of Forecast	Number Made	Percent Reliability
8 Hour Production	93	85.3
24 Hour General	62	86.3
Special	63	87.3

Radiological Sciences Department

Synoptic Meteorology (continued)

Temperatures averaged 51.4° F which was 1.6° below normal. Measurable precipitation, occurring on October 20 and 21, was 0.42", 0.17" below the monthly normal.

Experimental Meteorology

A field experiment was conducted to provide order-of-magnitude estimates of the translocation of small fluorescent particles initially deposited on the desert floor. Preliminary analyses of the data indicate that small particles are more easily dislodged from the surface immediately after their deposition on the surface. The particles appear to settle among the larger surface roughness elements, such as rock and gravel, with time and, because of the shielding effect of these larger particles, the small particles become less susceptible to wind pickup.

The second in a new series of tests designed to prove the adequacy of the fluorophotometric technique for measuring oil fog concentrations was completed. The remaining difficulties appeared to be minor.

Study was continued with the Applied Mathematics Unit on the transcription of a portion of the Meteorology Tower data to a special IBM card for the readier evaluation of certain meteorological parameters inherent in diffusion problems.

Earth Sciences

Dilution-velocity tests in a well about two miles due north of 200 East Area and south of Gable Mountain, using the electrical conductivity technique, disclosed a ground water velocity nearly twice that detected in the test well site north of the mountain. This indicates a zone of high permeability that may appreciably restrict 200 East Area waste disposal operations.

Equilibrium adsorption of Pu by soil from solutions containing commercial cleaning agents was erratic and highly dependent upon the pH. The use of large volumes of such cleaning agents, proposed for large scale plant decontamination work and ultimate disposal to ground, is thus contra-indicated.

Preliminary soil studies with synthetic solutions of first cycle scavenged waste indicated that cesium was removed from at least two column volumes of the waste. Strontium adsorption appeared as good as that of cesium.

Similar preliminary studies were conducted with two modifications of scavenged TBP waste, referred to as "high acid" and "low acid" waste. Cesium was removed from 3-4 column volumes of the latter but strontium breakthrough occurred in less than one column volume; both cesium and strontium breakthrough occurred in one column volume of the "high acid" waste. All solutions were at pH 9 before passing through the soil columns.

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Industrial Hygiene

Tests were made of certain respiratory protective devices utilizing ruthenium contaminated atmospheres directly from the Redox J-3 process line and H cell. Some penetration was observed but analytical results are presently incomplete.

A cooperative investigation was made with the Pharmacology and Experimental Therapeutics Unit, Biology Section, on the characteristics of aerosols in an animal exposure chamber during inhalation experiments.

Separation and characterization work was continued on radioactive particles for use in physical and biological tests. Twenty-four samples were studied to obtain particle size, weight, dosage rate, and microscopic characteristics. Twenty-six specimens were mounted and covered with thin mica for skin exposure tests.

Methods

The gamma ray spectrometer method for determination of the ratios of the activities of Ru^{103} and Ru^{106} in mixtures of these isotopes was successfully applied in the study of 65 particles to be used in particle hazard evaluation tests. The method is sufficiently sensitive to detect the difference between a pure Ru^{106} source and one containing 1 per cent Ru^{103}.

It was found that a plutonium "spike" can be quantitatively removed from urine by means of a cation exchange resin; study of the possible applicability of the procedure to Bioassay was commenced.

A gas flow proportional anticoincidence tube was assembled and given preliminary tests; satisfactory plateau and counting characteristics were obtained. Successful operation of such a tube would provide a very low background apparatus for low level counting of critical isotopes such as Sr^{90}.

A method was developed for the preparation of hydrous ruthenium oxide colloid which may find application as source material for aspirating particles into air streams for particle inhalation studies.

River Studies

River sampling stations were repaired or re-established during the month. Cross-sectional samples were collected at several locations for determination of beta particle emitters. Some cross-sectional velocity measurements were made.

Physics

The high-flux source of the positive ion Van de Graaff was operated successfully with Li (p,n) and Be (p,n) targets. The Be (p,n) target was found to emit neutrons for proton energies below the threshold energy for the reaction; this is probably due to a two-step reaction Be (p,d) and Be (d,n).

Radiological Sciences Department

Physics (continued)

The disk shaped ion chamber which had been shown to have good response for non-surface beta ray and gamma ray dose measurements gave about three-fourths of the value previously established by extrapolation chamber when used for surface beta ray measurements.

Routine progress was made on the design of a device for measuring beta ray dose from particles or from beams passing through fine apertures, the design of equipment for comparing thimble chamber and free air chamber measurements of x-rays such as those from plutonium, study of activation methods of boron determination for application to Meteorology oil fog tests, and preparation of a new body monitor.

Instrument Development

A doorway monitor using seven thin crystal beta scintillation detectors was developed for the automatic detection of active particles on personnel.

The continuous filter sampler for the Redox stack Ru-I monitor was received from fabrication; preliminary tests were satisfactory.

The cylinders for a hydraulic sample changer were fabricated and mounted and preliminary tests were started. The changer will handle fifty samples and then will re-cycle or stop, as desired. All pertinent information would be camera recorded.

A coder computer model for the radio telemetering system was completed and placed into operation. The timer and sequence units operated well from a signal source over a short radio frequency link.

The sensing elements and associated energizing components for the wind component meter were received and given preliminary test.

BIOLOGY

Aquatic Biology

Highlights of the Columbia River Survey

Activity densities of river organisms remained at about the same level as reported last month which is considered as the peak for the season. Selected values of interest were:

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Highlights of the Columbia River Survey (continued)

Organism	Location	Sample Type	Activity Density (/uc/g) September	Activity Density (/uc/g) October
Minnows (shiners)	Hanford	Avg.	5×10^{-3}*	3×10^{-3}
Whitefish flesh	Hanford vicinity	Avg.	3×10^{-4}	8×10^{-4}
Whitefish flesh	Hanford vicinity	Max.	2×10^{-3}	3×10^{-3}
Plankton	Hanford	Avg.	1×10^{-2}	1×10^{-2}
Midge larvae	McNary Reservoir	Avg.	9×10^{-4}	8×10^{-4}

*Corrected from value reported last month owing to inclusion of additional data.

Aerial observations show about 90 chinook salmon nests within the HAPO reservation thus far. More are expected within the next two weeks, but the ultimate number is not expected to approach the 292 observed in the parent year of 1950, since the run throughout the river is small this year.

Effluent Monitoring

Monitoring studies with chinook salmon conducted during the summer were concluded early in the month so that equipment could be revamped for new tests. A few young salmon were retained in 0%, 1%, and 5% area effluent to provide continued coverage, however. Significant mortality continued at the 5% level, but not at 1%. A concerted effort is being made to trap adult salmon in order to obtain local eggs for the new tests. To date all efforts have been unsuccessful.

Biology Control Unit

Biological Monitoring

Waterfowl activity densities were essentially unchanged from last month and last year.

Rodent thyroid activity densities generally increased slightly. Immediately west of the 200 West Area values were four times greater than in September.

Highest rodent fission product contamination in feces samples occurred in the region northeast of Redox. The maximum value of 2×10^{-4} /uc/g of feces occurred in specimens collected at the Meteorology Tower.

Clinical Laboratory, Radiochemistry and Microscopy

Blood analysis services increased 38% over all previous high levels. Other services followed the routine pattern.

Radiological Sciences Department

Experimental Animal Farm

Toxicology of I^{131}

There was no significant change in thyroid metabolism in any group of sheep compared with results of last month or one year ago.

In a continuation of the studies to determine the approximate single threshold toxic dose of I^{131} in sheep, preliminary results indicated that a 15 mc dose caused serious damage to the thyroid, while a 5 mc dose appeared to have no serious effect.

Whole Body Irradiation of Sheep

Twelve sheep were exposed to bilateral total body X-irradiation at 300, 450, and 600 r. All of them responded with decreased white blood cells. Wool loss and irritability also occurred at the higher doses.

Metabolism

Plutonium Absorption and Metabolism

Percutaneous absorption of plutonium (10 N HNO_3 solution) was measured in rats with intact skin and with punctured skin (spring-lancet), following exposure intervals of from one hour to 30 days. Results showed no significant difference in absorption between intact and punctured skin. Maximum absorption after 30 days was from two to three per cent of the applied plutonium.

Fission Product Absorption and Metabolism

Percutaneous absorption of ruthenium was measured in rats using 2 N and 0.01 N HCl solutions, and exposing for intervals of from 1 to 24 hours. Absorption was approximately tenfold higher from the more acid solution with a maximum absorption of 5% after a 24-hour exposure.

Feedings were completed in an experiment involving chronic stomach tube administration of ruthenium to rats for a period of 72 days. The highest ruthenium concentration was found in the kidneys. These results indicated that the present "official" MPC of ruthenium in drinking water is about forty times too high. Absorption of ruthenium from the gastro-intestinal tract was approximately two per cent of the amount fed.

Preliminary results from single-feeding experiments indicated a significant increase in absorption with increasing acidity of the solution fed in the range of pH 6 to pH 2. Absorption also appeared to increase with increasing mass concentration of ruthenium in the solution fed.

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Fission Product Absorption and Metabolism (continued)

The retention of ruthenium in the tissues of rats following a single intra-peritoneal injection was followed over a period of 16 days. The initial biological half-life of ruthenium in the blood was about 2 days. Loss of ruthenium from other tissues was much slower, with half-lives of perhaps 10 to 20 days for most tissues, and 50 days or longer in the bone.

Ruthenium in the blood is present almost entirely in the plasma, and seems to be associated with specific protein fractions.

Nine "ruthenium particles" were fed to rats for the purpose of determining gastro-intestinal absorption. Only preliminary results are available, but absorption is very low, probably 0.01% or less. In 8 of the 9 animals, practically all ruthenium activity was excreted within 24 hours.

Pharmacology and Experimental Therapeutics

Suspensions of 5 μc of $Pu(OH)_4$ were intratracheally administered to three young pigs.

Plant Nutrition and Microbiology

Plant Nutrition

Both Cr^{+3} and Cr^{+6} were found to decrease sugar concentration in leaves of bean plants. The higher valence state is about 100 times more active than the lower.

No build-up of radioactivity occurred during the past three years in either the plots watered with 100% or 5% reactor effluent. Although there was no evidence of further build-up of chromium in the plots watered with 100% effluent, there is a higher concentration in the 5% plots than was observed last year.

R. B. E. by Microbiological Methods

Tentative RBE values of 1.8 for diploid and 2.3 for haploid yeast were obtained in comparing tritium with P^{32} radiation.

[redacted]

FINANCIAL DEPARTMENT MONTHLY REPORT
OCTOBER, 1954

Basic data to be included in the Mid-year Budget Review was determined and a time schedule established which will result in submission of the document to the AEC by December 17.

Reports issued during October included Top Secret Document XX-1316, entitled, "Product Unit Cost (Current Basis) First Quarter Fiscal Year 1955." This included the detailed calculations made in combining production quantities, conversion factors, SF material costs, and conversion and depreciation costs to determine both high and low G/T plutonium unit costs for the period.

Product billing prices were increased as of October 1 in order to reduce accumulated under-liquidations and anticipated future unliquidated balances, since the cost of finished production for the first quarter of the fiscal year 1955 remained above the estimated unit cost used to establish billing prices for the quarter. For the most part, the failure of separations facilities to meet forecast unit costs and the acceleration of high cost uranium through the reactors, due to the changed production schedules, have caused an under-liquidation amounting to 9% of the shipments billed in the first quarter of the fiscal year.

Approximately 8500 freight and express bills paid for the account of AEC during the period from January 1 through June 30, 1953, were forwarded at the request of AEC to the General Accounting Office at Washington, D. C. These bills are for use in auditing transportation rates.

The Atomic Energy Commission plans to close out its orchard contracts and the contract with Big Bend Electric for furnishing power to the area within the near future. General Electric has been requested to dispose of the 6.9 KV transmission line involved.

General Electric has agreed, at AEC's request, to take over the physical control and accountability of AEC office machines and equipment necessary to supply AEC requirements in the 300 and 3000 Areas.

HOO-AEC has reached a tentative decision to dispose of all buildings and equipment held by Kaiser and Blaw-Knox, with the exception of certain specialized tools and items required by Minor Construction or HAPO. Previously, AEC had planned to retain a sizeable amount of property in a special "Equipment Held for Future Use" account.

Results of the annual physical inventory of Stores General Supplies, excluding automotive parts, which was taken as of September 22, 1954, reflected a net overage of $63,000. The ratio of this overage to total usage of $4,141,000 since May 1953, the date of the last physical inventory, is 1.5 percent.

[redacted]

DECLASSIFIED

Final reconciliation of the physical inventory of uninstalled equipment was completed during October, resulting in a net increase in the recorded value of plant and equipment of $19,162. Items inventoried and reconciled totaled 20,638, having an aggregated value of $18,364,066.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the AEC during the month amounted to $390,000. Appropriation requests approved during the month amounted to $41,372.

The SF Accountability Section was reorganized during the month, the organizational structure being brought into conformity, insofar as feasible, with that of the custodians of SF material. Further service functions will be possible, and one effect will be the reduction of duplication of records.

Effective October 15, 1954, a Procedures and Computing Section was established in the Financial Department and Harrison Tellier was appointed Manager of the Section with the title Manager - Procedures & Computing. The components of this section were in the Plant Auxiliary Operations Department, prior to dissolution of that Department.

Detailed reports for the Financial Department appear on succeeding pages, as follows:

Summary of Cash Disbursements, Receipts and Advances	I - 3
Audits and Procedures Section Report	I - 4 through I - 5
Cost and Budgets Section Report	I - 6 through I - 8
General and Personnel Accounting Section Report	I - 9 through I - 15
Procedures and Computing Section Report	I - 16 through I - 17
Property Accounting Section Report	I - 18 through I - 22
SF Accountability Section Report	I - 23 through I - 24
Personnel and Organization Statistics	I - 25 through I - 26

SUMMARY OF CASH DISBURSEMENTS, RECEIPTS AND ADVANCES

A summary of cash disbursements and receipts (excluding advances of $5,250,000 and $6,250,000, respectively, by the Atomic Energy Commission) for the months of October and September, 1954, is shown below:

Disbursements	October	September
Payrolls (net)	$2 875 120	$3 357 737
Materials and Freight	1 775 207	1 532 538
Payroll Taxes	549 323	576 985
Payments to Subcontractors	330 151	523 965
United States Savings Bonds	225 354	259 025
Group Insurance Premium	142 750	206 202
Satisfaction of Judgement	117 024	-0-
Pension Plan - Employees' Portion	116 154	105 878
Travel Advances to Employees	74 609	73 577
Income from Special Insurance Collateral Funds	-0-	265 981
All Other	128 070	135 108
Total	6 333 762	7 036 996
Receipts		
Rent	146 172	119 017
Hospital	59 819	55 036
Telephone	59 467	44 832
Electricity	55 012	57 648
Refunds from Vendors	41 331	1 140
Refund of Travel Advances to Employees	12 360	10 734
Sundry Accounts Receivable	9 438	12 579
Bus Fares	7 928	7 609
Sales to AEC Cost-type Contractors	3 218	6 615
Income from Special Insurance Collateral Funds	-0-	265 981
Other	6 682	9 366
Total	401 427	590 557
Net Disbursements	$5 932 335	$6 446 439

Outstanding advances as of October 31 and September 30, 1954 were as follows:

	October	September
Cash in Bank - Contract Accounts	$2 012 383	$2 674 718
Cash in Bank - Salary Accounts	15 000	35 000
Total	$2 027 383	$2 709 718

AUDITS AND PROCEDURES SECTION
MONTHLY REPORT - OCTOBER, 1954

Internal Audit

Reports were prepared and issued for the completed audits listed below:

Material and Gate Passes
Telephone Usage
Printing, Duplicating and Reproduction Services
Mail Distribution
Procurement and Maintenance of Office Equipment
Entries to Inventory Reserve Accounts
Termination of Purchase Order with the Crane Company

Reports were in the process of being prepared for the audits listed below:

Control of Safety Awards
Employee Attendance and Service Recognition Pins
Fabrication Work in Progress

Field work was continued on the Timekeeping and Personnel check.

During the month the following new audits were started and field work was continued through the end of the month:

Termination Clearance Procedure
Office Supplies
Cost Accounting Services

Follow-ups were made to determine extent of compliance with recommendations made as a result of the audits listed below:

Accounts Receivable - Electricity
Accounts Receivable - Sundry
Bank Reconciliations
General Electric Suggestion Plan

Administrative Planning

A total of 76 Organization and Policy Guides were distributed during October. One of these, 03.4 (Functions and Responsibilities of the Manager - Finance) was distributed to List 1 only; the balance to List 2.

Of the 75 guides distributed to List 2, there were 7 Organization and Appointments guides, 60 Functions and Responsibilities guides and 11 instructional-type guides. Of the latter, three were General Manager issues, five were issued by the Manager - Employee and Public Relations, one issued by Manager - Finance and two were joint issues of the Manager - Employee and Public Relations and Manager - Finance.

The three issued by the General Manager were:

06.7	Compliance with Anti-Trust Laws
09.3	Reports Pursuant to Federal Regulations of Lobbying Act
05.1	Plant and Equipment Appropriations

In addition to these guides, Organization and Appointment, and Functions and Responsibilities guides were prepared to reflect reorganizations occasioned by the discontinuation of the Plant Auxiliary Operations Department and changes within Financial Department. By month's end, however, none of these guides had been distributed.

One Office Letter was distributed, No. 202 - "Delivery and Pick-up Service for Prints and Tracings".

Seventeen AEC transmittals were received, seven for action by the General Electric Company and ten for information only.

Accounting Procedures

One business graduate was permanently assigned to the Plant Accounting Unit during the month, leaving four in training at the close of October.

A revised procedure for the processing of claims against carriers and vendors was submitted to the responsible section manager.

Recommendations for the processing of accounts payable vouchers were referred to the responsible section manager.

Seven business graduates were given a conducted tour of the outer areas during the month of October.

Two exempt employees attended an orientation class for familiarization with the new IBM "702" electronic data processing machine conducted by the International Business Machines Corporation.

Work was continued on the editing of the Internal Audit Manual.

Reimbursement Accounting

A special assignment completed during October was the revision of suffix codes for the Financial Department to agree with the new organization effective November 1, 1954.

One exempt employee was loaned to Special Studies for the last two weeks in October.

Six approval letters were received from the AEC during the month.

COST AND BUDGETS SECTION
MONTHLY REPORT - OCTOBER, 1954

Product billing prices were increased effective October 1, 1954 in order to reduce accumulated underliquidations and prevent future unliquidated balances. Cost of finished production for the first quarter of FY 1955 remained above the estimated unit cost used to establish billing prices for the quarter. For the most part, failure of Separations facilities to meet forecast unit costs and the acceleration of high cost uranium through the reactors, due to the changed production schedules, have caused an underliquidation amounting to 9% of shipments billed in the first quarter FY 1955.

Top Secret Document XX-1316 titled "Product Unit Cost (Current Basis) First Quarter Fiscal Year 1955" was issued. This document shows in detail the calculations made in combining production quantities, conversion factors, SF Material costs, conversion and depreciation costs to determine both high and low G/T plutonium unit costs for the period.

Consolidations and Budgets Unit

Accountants were advised of basic data relative to the Mid-year Budget Review and a time schedule was established which will result in submission of the budget to AEC by December 17, 1954.

Engineering Cost

A study with representatives of the Technical Section was made of the following facilities being fabricated for use in Research and Development Programs to determine if all or any portion should be considered as capital equipment rather than operating costs: (1) Heat Transfer Loop in 189-D Building and (2) Corrosion Loop and High Temperature and Pressure Water Loop.

Approval of work orders issued by Project Section for performance by Plant Forces was reassigned from Accountant - Engineering Cost to the Manager - Manufacturing. Several meetings were held with Manufacturing and Engineering Department management relative to the proposed performance by Plant Forces and certain line distribution work required by Project CG-558, Reactor Plant Modification for Increased Production.

Meeting was held with representatives of the Project Section for evaluating adequacy of standard liquidation rates based on latest work forecasts. Principal changes involved reducing Minor Construction Indirect Expense from 19% of Direct Labor to 17% and reducing CPFF Service Contract Fee from 4% to 3% of Direct Labor. Another review of rates will be made after actual costs are determined for the second quarter of FY 1955.

Work began on the budget instructions for the FY 1957 and Revision of FY 1956 Plant and Equipment Projects Budget. In line with recommendations made by the Manufacturing Department, it is planned to issue these instructions early in November along with tentative dates for information to be submitted.

General Cost

In preparation for the transfer of certain cost functions to Manufacturing Cost from the former Plant Auxiliary Operations Cost Group, work is progressing

satisfactorily with regard to the following:

(1-Appropriation requests are being reviewed and costs transferred to Plant Accounts wherever possible. Active appropriation requests which now become the responsibility of Manufacturing Cost will be transferred together with applicable balances. A complete review of equipment funds is under way and funds allocated to the former Plant Auxiliary Operations Department, together with pertinent information on outstanding appropriation requests and purchase orders, will be transferred to the Manufacturing Department or to the Employee and Public Relations Department.

(2-"G" number expense codes have been revised for use either by Manufacturing Department or by Employee and Public Relations Department for those functions transferred.

(3-Actual costs for this fiscal year are being recast to conform with the new organizational structure and appropriate transfers to other cost units will be made where indicated.

(4-Schedules are being prepared showing actual operating budgets for those activities transferred to other departments and will be submitted to the appropriate cost accountant.

A preliminary discussion meeting on the Public Administration Services report on the operation of Kadlec Hospital was attended by the financial representative for the hospital. This meeting included representatives of the General Electric Company and of the AEC. Separate discussions were held by the hospital financial representative and Mr. P.E. Carrico of the Commission to clarify several points with regard to financial information contained in the report. Three major points or areas will be discussed in the near future between General Electric and AEC Management. These points are:

(1-Proposed time of transfer.

(2-Location of Industrial Medical First Aid Facilities.

(3-Cost to Industrial Medical for the sale of Clinical Laboratory and X-ray services.

In connection with reporting costs for the Community, it was decided that it would be of benefit to all concerned to combine under one heading the reporting and budgeting for the Maintenance and Renovations Unit which has previously been budgeted as six Units. This will be accomplished without sacrificing any cost control, but at the same time will allow the superintendent of this unit more flexibility in transferring personnel from one program to another, depending on requirements of the work load.

Ledgers and correspondence pertaining to the Personnel Management Function of the Employee and Public Relations Department were segregated from the rest of our files on a fiscal year to date basis for transfer to the Employee and Public Relations Cost Unit.

Manufacturing Cost

A safety and security meeting was held for all Manufacturing Cost employees on October 27, 1954. Immediately following this meeting the personnel who are to be transferred to the Manufacturing Cost Unit from the dissolved PAO Cost Group were introduced.

New customer and servicing cost codes were established for Transportation, Purchasing and Stores, and Electrical Distribution Sections which were transferred to the Manufacturing Department. A code was opened for the 200 West Laundry which was transferred to Separations Section.

All routine work orders were rewritten on a new "F" series work order form and submitted to customer and servicing units for approval. Out of 304 orders rewritten approximately 80 were cancelled after review by customer units.

Part D of the Manufacturing Department Work Order Procedure, which covered the use of cross orders, was issued.

The Separations Section portion of the Manufacturing Department Quarterly Savings & Improvement report was prepared and submitted to Manufacturing Department management.

The Essential Material account listing was revised and six new accounts were added to provide codes for 100-K materials not previously in inventory. A revised price list for essential materials to be used during the second quarter of FY 1955 was issued.

An accrual of $75,000 was set up to cover anticipated losses on Mint canning and extraction material, and impending cancellation charges on a purchase order for a number of furnace pots which were to be fabricated for the Mint extraction program.

A detailed production and dollar comparison of first quarter FY 1955 actual manufacturing costs with budget and bogey amounts was issued. This comparison included explanation of major variances.

A major portion of this month's activity centered around the preparation of the FY 1955 Mid-year Budget Review. Area representatives were working on personnel and overtime forecasts, equipment not included in construction projects, and material requirements. Budget personnel in the 700 Area were recasting the year-to-date actual data under the new organizational structure and preparing other historical data for field use.

As part of a program to eliminate unnecessary and duplicate reports, a note was attached to the Equipment Not Budgeted in Construction Projects report stating that unless objections were made the detailed report would be issued only each quarter with a recap issued each month. The Metal Preparation Section indicated that the monthly detail was valuable to them and therefore only this portion of the report will continue to be detailed on a monthly basis pending further review.

GENERAL AND PERSONNEL ACCOUNTING SECTION
MONTHLY REPORT - OCTOBER, 1954

NARRATIVE REPORT

A discussion of "The Development of Men" was participated in by all exempt personnel of the section at an employee information meeting held October 26, 1954.

General Books Unit

The balances in the contract and payroll bank accounts at October 31, 1954 aggregated $2,027,383, reflecting an agreement with the Commission to maintain these bank accounts at approximately $2,000,000 after September.

The contract bank account maintained with the Chemical Bank and Trust Company of New York was closed in October by the transfer of the balance to the Seattle-First National Bank. Salary Account No. 2 was reduced from $30,000 to $10,000.

All outstanding travel advances to employees as of October 31 were less than 60 days old.

Travel and living expense variation ($540) and conference expenses ($2,492) recorded in the first quarter of FY 1955 were billed to General Office to be charged against the overhead allowance.

Accounts Payable Unit

Collect transportation bills numbering approximately 8500 for the period January 1 through June 30, 1953 were reviewed and forwarded to the General Accounting Office, Washington, D. C., on October 27, 1954. Payment data and damage and overcharge claim information were attached.

Two group meetings were held in Accounts Payable during October with all personnel attending. Arrangements also were made on October 27 to schedule on November 3 the showing of the films "Here's Hanford" and "The Atom Goes To Sea."

Accounts Receivable Unit

Gross accounts receivable balances decreased a net amount of $10,652 during the month. Details may be summarized as follows:

Decreases:	
Rent	$22 759
Telephone	5 933
Others	410
Total decrease	$29 102

Increases:	
Sundry	$ 7 824
Electricity	6 410
Hospital	4 216
Total increase	18 450
Net decrease	$10 652

A payment of $10 360 was received from Spokane Housing Inc., covering land use rental for the period July 1, 1954 to June 30, 1955 of land known as Parcels K-6, N-1, and N-2, rented to Spokane Housing.

Personnel Accounting Unit

The procedure for the issuance of Employee Sales Certificates was changed in October to provide for the issuance of the certificate by mail after the purchase has been completed.

Special absence reports covering 296 nonexempt employees for the fiscal quarter ended September 26 were forwarded to section managers. This is an improvement over the previous quarter when 385 special absence reports were distributed.

Retroactive salary payments totaling $3,485 were made on October 11, 1954, to 13 employees, not named in any of the three law suits filed by community firemen, for the period of their employment as Two-Platoon Firemen to April 25, 1954, the date on which overtime premium as required by the decision in the Porter vs. General Electric case was paid on a current basis. These payments were made under the Fair Labor Standards Act as interpreted in the Porter case.

During the month employees who had filed waivers or who had discontinued contributions to the Pension Plan were resolicited. As a result 26 employees who had previous filed waivers elected to participate in the Pension Plan and 7 who had discontinued resumed participation. Of 37 employees becoming eligible for participation in the plan during October, 36 elected to participate. 7,964 employees, 98.1% of the total payroll, are now participants in the Pension Plan.

All payroll records were converted to new four-digit payroll suffix codes. Conversion was made effective on time cards for the week ended October 31, 1954 for the weekly payroll and as of the end of the month for the monthly payroll.

Lists of personnel on both weekly and monthly payrolls who have not taken vacations were prepared and distributed to all departments.

Payroll tax returns for the third quarter 1954 for Federal Income tax, FICA tax and State Unemployment Compensation were completed and forwarded to Schenectady. Returns covering state and local income taxes for the third quarter 1954 were forwarded to the proper state and local taxing authorities.

The following Reimbursement Authorizations were received during the month of October:

R.A. No.	Subject
232	Additional Classifications - Accountability A, B, C, D
233	Additional Classification - Chief Control Operator (Power)
234	Revision of Classification - Engineering Assistant

The bank balances in the payroll bank accounts were reduced during September and October to the following:

Salary Account No. 1 - New balance $ 5,000
Salary Account No. 2 - New balance $10,000

Three annuity certificates were delivered to former duPont employees in October. To date 104 annuity certificates have been issued.

Employee communications meetings were held with all employees of the unit.

STATISTICS

General Books Unit

	October	September
Advances from AEC		
Balance at beginning of month	$2 709 718	$2 906 157
Advances received from AEC	5 250 000	6 250 000
Other cash receipts	401 427	590 557
	8 361 145	9 746 714
Less disbursements	6 333 762	7 036 996
Balance at end of month	$2 027 383	$2 709 718
Advances requested for subsequent month	$6 175 000	$5 250 000
Travel Advances to Employees		
Balance at beginning of month	$ 68 797	$ 66 462
Advanced to employees	74 609	74 279
	143 406	140 741
Less:		
Travel, living and conference expenses reported by employees	60 540	61 210
Cash refunded by employees	12 360	10 734
	72 900	71 944
Balance at end of month	$ 70 506	$ 68 797
Outstanding Travel Advances to Employees		
Current	$ 64 253	$ 65 417
Outstanding over 30 days	6 253	3 380
Total	$ 70 506	$ 68 797

Employees' Travel, Living and Conference Expenses

	October	September
Reported by employees, etc:		
Travel and living expenses		
Off-site inspectors	$ 24 399	$ 23 137
Others	33 847	37 529
	58 246	60 666
Conference expenses	2 294	544
Total	60 540	61 210
Less:		
Expenses for trips which included attendance at Association Island conferences, temporarily transferred to Undistributed Costs	(4)	2 785
Expenses transferred to AEC	(1 011)	1 011
Expenses charged to other G.E. components or carriers	2 932	2 555
Living expenses in excess of $9 per diem	3	512
Conference expenses	2 294	544
	4 214	7 407
Amounts determined to be payable by AEC	$ 56 326	$ 53 803
Number of expense reports submitted by employees	268	264

Accounts Payable Unit

	October	September
Accounts Payable:		
Balance at beginning of month	$ 733 002	$ 563 654
Vouchers entered	3 291 572	3 595 504
Accrual for inventories	31 387	28 507
Cash receipts	41 331	1 140
	4 097 292	4 188 805
Less:		
Vouchers paid	3 233 287	3 420 275
Reversal of accruals	28 507	35 528
	3 261 794	3 455 803
Balance at end of month	$ 835 498	$ 733 002

Other Statistics

Number of vouchers recorded	3 939	4 230
Number of checks issued	2 435	2 579
Number of freight bills paid	1 629	1 632
Amount of freight bills paid	$ 340 211	$ 333 268
Number of purchase orders received	1 996	2 116
Amount of purchase orders received	$2 122 713	$1 416 613
Amount of cash discount earned	$3 837	$5 929

Accounts Receivable Unit

Account	Balance 9-30-54	Net charges	Collections	Balance 10-31-54	Number of bills issued during month
Hospital:					
Active	$ 96 310	$ 67 399	$ 64 314	$ 99 395	1 332
Collection agencies (93 accounts)	11 282	1 171	40	12 413	
Sundry:					
Active	28 525	16 919	9 307	36 137	297
Collection agencies (141 accounts)-a)	7 371	409	197	7 583	
Telephone	47 765	54 262	60 195	41 832	6 846
Electricity	27 272	62 034	55 624	33 682	3 873
Equipment sales to facilities (1 account)	24 430		349	24 081	
Rent	46 502	393 042	415 801	23 743	6 886
Cost-type contractors	17 729	3 148	3 218	17 659	15
Safety shoes	1 207	2 897	2 675	1 429	255
Loans to employees (4 accounts)	733		213	520	
Sub-total	309 126	601 281	611 933	298 474	19 504
Reserve for bad debts	32 070			32 717	
Net	$277 056			$265 757	

(a- Includes all utility and rental accounts.

Personnel Accounting Unit

Number of HAPO Employees	Total	Monthly Payroll	Weekly Payroll
Changes during month			
Employees on payroll at beginning of month	8 725	2 289	6 436
Additions and transfers in	139	6	133
Removals and transfers out	(75)	(15)	(60)
Transfers from weekly to monthly payroll		13	(13)
Transfers from monthly to weekly payroll		(4)	4
Employees on Payroll at end of month	8 789	2 289	6 500

Overtime Payments During Month	October Number	October Amount	September Number	September Amount
Weekly Paid Employees	7 081	$111 361-a)	4 620	$64 323-b)
Monthly Paid Employees	323	23 264	352	26 524
Total	7 404	$134 625	4 972	$90 847

Number of Changes in Salary Rates and Job Classifications	October	September
Temporary changes	93	132
Retroactive changes	13	11
Normal changes	780	992
Total	886	1 135

Gross Payroll Paid During Month	October	September
Engineering	$ 846 736	$ 792 484
Manufacturing	2 101 884	1 732 488
Plant Auxiliary Operations	950 540	807 457
Other	800 449	711 213
Total	$4 699 609-a)	$4 043 642-b)

(a- Payments to weekly paid employees are for five week periods.
(b- Payments to weekly paid employees are for four week periods.

Employee Benefit Plans	Number Participating		Percent Participation	
Participation in Benefit Plans at Month End	October	September	October	September
Pension Plan	7 964	7 956	98.1%	97.9%
Insurance Plan				
Personal coverage	8 724	8 656	99.3	99.2
Dependent coverage	6 149	6 099	-	-
U.S. Savings Bonds				
Stock Bonus Plan	4 402	4 388	50.1	50.3
Savings Plan	1 151	1 142	13.1	13.1
Both plans	5 008	4 983	56.9	57.1

Pension Plan	October	September
Number retired	6	8
Number who became eligible for participation	37	48
Number who applied for participation	36	40
Number who elected not to participate	-	7
Replies not received	1	1

Insurance Plan - Number of Claim Payments		
Employee life insurance	2	2
Employee accident and health insurance	445	451
Dependent accident & health insurance	452	449
Total	899	902

Good Neighbor Fund		
Number participating	6 187	5 876
Percent of participation	70.4%	67.3%

Suggestion Awards		
Number of awards	67	41
Total amount of awards	$1 220	$810

Preferential Rates		
Number (elminated) or added	(1)	(18)
Number currently in effect	559	560

Number of Military Allowance Payments	6	8

Number of Payroll Deductions - Other than Taxes	October	September
Barracks rent	14	8
Dormitory rent	500	567
Good Neighbor Fund	12 707	10 205
Hospital	576	442
House rent	4 937	5 040
Insurance	8 904	8 657
Pension	30 100-a)	24 500-a)
Safety shoes	851	641
Savings Bonds	18 863	15 177
Trailer space	197	143
Union dues	1 986	1 970
Other	180	185
Total	79 815	67 535

(a- Approximate number rounded to nearest hundred.

PROCEDURES & COMPUTING SECTION
MONTHLY REPORT - OCTOBER 1954

GENERAL

Effective October 15, 1954, a Procedures and Computing Section was established in the Financial Department and Harrison Tellier was appointed Manager of the Section with the title Manager - Procedures & Computing. This group is composed of the Procedures Unit, Numerical Analysis group, and Computing Unit of the Operations Analysis Section, as well as the Records Unit. These groups were formerly in the Plant Auxiliary Operation Department, before its dissolution.

PROCEDURAL ANALYSIS

Procedures were prepared for the processing of the Physical Inventory tags from General Supplies Inventory. The tags were received by Computing, sorted to tag numbers, and a list of the missing tags prepared. The tags and report were then returned to Stores for checking. When checking was complete, the cards were returned to Computing where prices and quantity were punched into the tags. The tags were then extended and the value for each was punched. They were then listed in number sequence, within captions, giving tota value for each caption. This procedure saved time and expense in valuation of the inventory, and facilitated checking and verification of the inventory.

The procedure for processing payroll vouchers by Computing was revised to include a new control panel that makes a test of the crossfoot of earnings, taxes, pensions, and net amount on each voucher. Discrepancies discovered by the machine are noted on the face of the report. Additional control totals are provided and checked against controls provided by the Payroll Preparation Unit. A further result of this revision is the possibility of using check reconciliation cards prepared directly from this procedure.

Purchase Order and Receiving Report forms, currently in use, have been revised, to make possible the preparation of a Receiving Report as a by-product of the Purchase Order. This eliminates the necessity of rewriting the information on the Purchase Order. A considerable saving in time and manpower is anticipated. The new procedure will be effective within the next 60 to 90 days, as soon as supplies and equipment can be obtained.

A method which will establish complete accountability for "offsite documents" was designed and approved. Computing will furnish Classified Files with cards for data picked up from File Record Cards, Outgoing Receipts, and Certificates of Destruction. Classified Files will devise a standard form of entry for all documents and will change data on the cards to conform.

RECORDS

Quantity of Records received, processed and stored:

Employee & Public Relations Department	20	Standard	Storage	Cartons
Engineering Department	31	"	"	"
Financial Department	259	"	"	"
Manufacturing Department	83	"	"	"
Radiological Sciences Department	8	"	"	"
	401			

Seven hundred and sixty cartons of records were destroyed.

PROCEDURES & COMPUTING SECTION

COMPUTING OPERATIONS

During the month of October the following non-routine jobs were completed for customers:

Financial	14
Plant Auxiliary Operations	3
Employee & Public Relations	4
Manufacturing	9
Engineering	19
TOTAL	49

Service charges for the month amounted to $38,247.00. Services, by customer department, were as follows:

Atomic Energy Commission	$ 350.00	0 % *
Employee & Public Relations	687.00	02
Engineering	12 054.00	32
Manufacturing	819.00	02
Financial	22 428.00	59
Radiological Sciences	404.00	01
Plant Auxiliary Operations	1 505.00	04
	$38 247.00	100%

* Less than 1%

October cost reports were delivered to cost groups earlier than any monthly cost reports to date.

PROPERTY ACCOUNTING SECTION
MONTHLY REPORT - OCTOBER 1954

Plant Accounting Unit

Final reconciliation of physical inventory of uninstalled equipment was completed during October, resulting in a net increase in plant and equipment of $19,162. Items inventoried and reconciled totaled 20,638, having an aggregate value of $18,364,066. Balancing of detail records to subsidiary accounts was completed for the 100, 200 and 300 Areas. Discrepancies noted during balancing were traced to their origin and corrected.

A total of 1,762 individual control cards were processed during the month. Property custodians transmitted 674 items requiring record changes. Items forwarded to custodians for action totaled 779. Transfers or property custodian reassignments accounted for changes of 309 property record control cards.

A joint information meeting was held in 200-West Area with all Separations Section property custodians. The purpose of the meeting was to acquaint property custodians with the plans and procedures for the accountability and control of plant and equipment.

An inventory of Minor Construction small tools was taken during the month. Inventory results are being consolidated on an inventory listing. The small tools account will be split into three subsidiary accounts: (1) Small Tools - Cataloged, (2) Small Tools - Uncataloged, and (3) Small Tools - Expense.

The pricing of the 115 KV Transmission Line has been tentatively discontinued. A definite date of transfer has not been established since Bonneville Power Administration is seeking approval of funds to operate the system. When a firm date is established, the Atomic Energy Commission will notify Plant Accounting and accrued reserve will be calculated for the third and final time.

Procedures for unitization of projects to be used by Blaw-Knox and Kaiser Engineers were issued during the month.

Value of plant and equipment at October 31, 1954 follows:

	(In Thousands)		
	Asset	Reserve	Net
Completed Plant and Equipment	$738,263	$290,530	$447,733
Construction Work in Progress	36,386		36,386
Total Cost Recorded (GE Books)	774,649	290,530	484,119
AEC and Other Contractor Costs			
Land and Land Rights	5,476		5,476
Construction Work in Progress	178,699		178,699
Total-1)	$958,824	$290,530	$668,294
(1-Includes the following costs:			
Community Facilities	$ 87,144	$ 22,587	$ 64,557
Medical Facilities	1,336	369	967
Total - Community and Medical	$ 88,480	$ 22,956	$ 65,524

Plant Accounting Unit - contd

The following personnel changes in Plant Accounting Unit were made during October, 1954:

One employee was transferred from Contract Cost Section.
One employee was reassigned within the Property Accounting Section.

The addition of two employees increased Plant Accounting total to thirty-nine, seven exempt and thirty-two non-exempt.

Inventory Accounting Unit

Results of the annual physical inventory of Stores general supplies, excluding automotive parts, which was taken as of September 22, 1954, reflected a net overage of $63,000. The ratio of this overage to total usage of $4,141,000 since May 1953, the date of the last physical inventory, is 1.5 percent. With respect to this overage, considerable time was spent during the month in analyzing source documents, custodial records and other data to determine reasons for the variance. The results of the analysis indicated that the variance was due mostly to the following:

1. Applying incorrect unit prices to materials when disbursed.

2. Clerical errors which resulted in incorrect extensions in valuing materials disbursed.

3. Disbursing materials in units of issue which are impractical, thus causing valuation errors.

A detailed report covering final results of this inventory is now in process and is expected to be issued sometime in November 1954.

Final arrangements were made and detailed instructions were prepared and issued to custodial personnel for taking the following physical inventories during October and November, 1954:

Inventory	Custodial Organization	Inventory Date
Materials on Service Trucks	Telephone Sub-Section	October 26, 1954
Road Materials	Transportation Section	November 4, 1954
Road Materials	Community Section	November 5, 1954
Spare Parts	Stores Sub-Section	
200-East Area		November 10, 1954
100-H Area		November 17, 1954
700 and 3000 Areas		November 22, 1954

Reports were issued covering the results of the following physical inventories:

1. Special Materials in the custody of Engineering, Manufacturing and Radiological Sciences Departments.

2. Spare Parts and General Supplies in the custody of Community Section.

Inventory Accounting Unit - contd

For informational purposes for the Atomic Energy Commission, a summary was prepared of the results of all physical inventories taken during fiscal years 1954 and 1955. The data shown on the schedule, according to fiscal years, included inventory titles, responsible organization, date inventory was taken, physical inventory value, adjusted book value, amount of variance together with percentage of variance to adjusted book value, and a concise explanation of reason for variance.

On October 13, 1954, a meeting was held with all the designated control custodians for special materials. This meeting was held for the purpose of reviewing in detail the requirements of Organization and Policy Guide 04.10 and the document control procedure with respect to the special materials inventory with a view toward clarifying any misunderstandings which had developed since August 25, 1954, when the new control procedure was placed into effect.

Following is a summary showing inventory account balances for the months of September and October, 1954, together with the amount of change:

	(In Thousands) Book Balance 9/30/54	10/31/54	Increase (Decrease)
Current Inventories			
General Supplies	$ 1,476	$ 1,505	$ 29
Fuel and Lubricants	59	55	(4)
Essential Materials	3,317	3,361	44
Total Current Inventories	4,852	4,921	69
Special Materials	1,413	1,412	(1)
Spare Parts	2,692	2,819	127
Excess Materials	1,285	1,268	(17)
Total Inventories - Gross	10,242	10,420	178
Less: Spare Parts Inventory Reserve	(656)	(655)	(1)
Excess Inventory Reserve	(929)	(885)	(44)
Total Inventories - Net	$ 8,657	$ 8,880	$ (223)
As a Memo:			
Excess Equipment	$ 2,208	$ 2,046	$ (162)
Excess Equipment Reserve	(1,686)	(1,506)	(180)

Increase in gross value of inventories at October 31, 1954, over the value at September 30, 1954, is due principally to the transfer of spare parts valued at $146,000 from Kaiser Engineers for the 100-K facilities.

Property Management Unit

The HOO-AEC plans to close out their orchard contracts and the contract with Big Bend Electric for furnishing power to the area within the near future. General Electric has been requested to dispose of the 6.9 KV Transmission Line involved.

Property Management Unit - contd

General Electric has agreed, at AEC's request, to take over the physical control and accountability of AEC office machines and equipment necessary to supply AEC requirements in the 300 and 3000 Areas.

HOO-AEC has reached a tentative decision to dispose of all buildings and equipment held by Kaiser and Blaw-Knox, with the exception of certain specialized tools and items required by Minor Construction or HAPO. Previously, AEC had planned to retain a sizeable amount of property in a special "Equipment Held for Future Use" account.

An Organization and Policy Guide on the control of inventories has been prepared and submitted to department managers for comment. This will bring up to date a series of letters issued by the General Manager on this subject.

A tentative Organization and Policy Guide on the control of off-site shipments of equipment is in the process of preparation and discussion with personnel concerned.

A system has been instituted and is now working which clears up the difficulties previously encountered in regard to controlling and accounting for the equipment and materials procured by General Engineering Laboratory under the Assistance to Hanford program.

Appropriations Unit

Project proposals and informal requests which were processed by Appropriations Unit and directives issued by the Commission during the month of October are shown in the following list:

CG-496 - Recuplex Installation - Building 234-5

Revised proposal dated September 27 requesting an increase in funds from $1,482,000 to $1,700,000 was approved by GE and forwarded to the Commission October 4. After review, the Commission authorized, by directive dated October 22, $1,600,000 and by accompanying letter requested that the proposal be revised to accommodate certain Commission expenses and to take into consideration the modification of scope to meet the requirements of the 4X Program.

CA-546 - Fuel Element Pilot Plant

Project proposal dated February 17, 1953, requested $1,810,000 for design and construction of a 160' x 180' structural steel building in the 303 exclusion area for semiworks, development and supporting shop areas. $1,600,000 (AEC $1,105,000, GE $495,000) was approved for this work. Revised proposal requesting $400,000 increase in over-all funds (total funds $2,000,000 - AEC $715,000, GE $1,285,000) for installation of semiworks equipment was approved by the AEC September 6, 1954.

Appropriations Unit - contd

CA-555 - Graphite Hot Shop and Storage Facilities - 3730 Building

Project proposal requesting $93,000 (GE $16,200) was forwarded to the Commission September 23, 1953. The proposal was returned October 22 for reconsideration and possible revision. Letter dated December 11, A. B. Greninger to J. I. Thomas, re-submitted proposal without change to the Commission. Letter dated March 30, 1954, D. F. Shaw to P. D. Lee, authorized GE to proceed with a study of various alternates in lieu of the proposed Graphite Hot Shop. Design of the facility was authorized, it being understood that the most economical of the various alternates considered in the study would constitute the project. Project proposal forwarded to the AEC July 22 requested $83,500 (GE $38,500) for conversion of the 3730 Building to a graphite hot shop. AEC authorized the project September 30, 1954.

CA-607 - Additional Records Storage Facilities - 712 Building

Project proposal requesting $96,000 (GE $11,000) for increasing the Hanford record storage space by constructing an addition to the existing 712 Building was forwarded to the Commission October 22.

CG-608 - Redox Crane Viewing Room

Project proposal requesting $21,000 for design and construction of a crane viewing room on the existing crane maintenance platform of the Redox canyon was forwarded to the Commission October 19.

CG-610 - Replacement of Existing 313 Building Roof

Project proposal requesting $55,000 to replace the deteriorated built-up roof of the original sections of the 313 Building with a new built-up roof was forwarded to the Commission October 25.

SF ACCOUNTABILITY SECTION
MONTHLY REPORT - OCTOBER, 1954

Reorganization of the SF Accountability Section constituted one of the most important changes initiated during the month. In so far as feasibility studies permitted the organizational structure was brought into agreement with that of the custodians of SF Material. In addition to the obvious advantages further service functions will now be possible. The effect will be to reduce duplications of records and as a matter of record three such cases are now under investigation.

The Normal Uranium SF Accountability controls continue to provide satisfactory control. Receipt of hollow slugs, cored slugs, plugs and other materials in small quantities has provided a warning of the changes which will result. Revision of the existing controls is currently in progress so as to parallel fundamental changes in operation. The major changes will involve the process solution account due to the difference encountered in pickling cored slugs as compared with the standard solid slug.

Attempts to reduce inactive status materials inventory have been delayed due to construction of facilities at the Fernald Area. Our activities are on record with the Commission and the delay in shipment is on their written response to our Request To Ship.

The highest priority is now being given to the establishment of a Reactor Area - SF Accountability Unit so as to provide an organizational component that will devote its exclusive interests to File problems. Currently the organizational phases have been completed and the problem has now been reduced to personnel staffing.

Further progress on process flow was reported in October applicable to TBP and UO_3 processes. This is the initial move in the revision of these accounts and the standard accounting procedures have since been prepared. Performance trials are scheduled for November through one accounting cycle and if found satisfactory will be installed prior to year's end and probably by December 1, 1954. The problem of Security procedure control of work sheets, Journal entry sheets and other material used in the SF Accounting procedure still requires Security approval.

Fundamental measurements associated with calibration problems have been investigated choosing the more important tanks having direct bearing on SF Accountability records. Verification of technical audit findings are now in progress.

Services of a consulting nature were rendered the Manufacturing Department relative to the format and procedures associated with the production report issued by the Manufacturing Department.

Off-site relations with Shippers and Receivers of SF Materials were reviewed for the purpose of confirmation of G. E. invoice statements as indicated by accounting or measurement commitments used on the official transfer forms (SF 101's). These are continuing investigations directed toward the firming up of GE-HAPO commitments.

Numerous AEC transmittals were received with particular emphasis on standardization of physical inventory forms. We have requested further clarification of points not covered by the initial transmittal. It is anticipated that some advance notice will be given but that the submitted forms will ultimately be the required reporting procedure. An appreciable increase of work load is associated with their adoption.

As a reversal of their previous position, the Technical Section have now scheduled the operation of the oxide burner and the investigation of alternate methods of fire hazard control due to free metal have been abandoned.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION
OCTOBER 1954

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning of month	386	386
Additions and transfers in*	86	5
Removals and transfers out	6	5
Employees at end of month	466	386
Personal by Unit at Month-End		
General	8	7
Audits and Procedures Section		
Accounting Procedures	2	2
Administrative Planning	2	2
Internal Audit Unit	17	17
Reimbursement Accounting	5	5
	26	26
Cost and Budgets Section		
Consoldiations and Budgets Unit	9	8
Engineering Cost Unit		
General	5	5
Design Section Costs	6	7
Project Section Costs	16	16
Technical Section Costs	11	11
General Cost Unit		
General	2	2
Community Operations and Real Estate	7	7
Medical	3	3
Plant Auxiliary Operations	16	16
Radiological Sciences and others	8	8
Manufacturing Cost Unit		
General	2	2
Analysts	3	3
Budgets and Control	15	15
Records and Reports	14	14
Financial Representatives	7	7
	124	124
General and Personnel Accounting Section		
Accounts Payable Unit	32	31
Accounts Receivable Unit	21	22
General Books Unit	19	19
Personnel Accounting Unit		
General	3	2
Monthly Payroll	12	11
Benefit Plans Accounting	12	12
Personnel Records, Nonexempt	8	8
Payroll Reports	7	7
Weekly Payroll	19	20
Payroll Planning & Analysis	6	7
	139	139

* Includes addition of Procedures and Computing Section October 15.

	Current Month	Prior Month
Procedures and Computing Section		
Records Unit	7	
Numberical Analysis Unit	10	
Computing Operations Unit	48	
Procedural Anaylsis Unit	14	
	79	
Property Accounting Section		
General		2
Appropriations Unit	5	4
Inventory Accounting Unit	12	12
Plant Accounting Unit	39	37
Property Management Unit	3	3
	59	58
SF Accountability Section		
Measurement Methods Unit	5	5
Process Flow Unit	7	3
SF Accounting Unit	2	2
SF Records and Reports Unit	12	15
	26	27
Rotational Trainees	5	5
	466	386

OPERATIONS RESEARCH STUDY

MONTHLY REPORT
OCTOBER, 1954

An Operations Research Study was established by the General Manager effective October 15, 1954 to continue until December 31, 1955.

The objectives of the Study are:

1. to determine the value of operations research to the Hanford Atomic Products Operation.

2. to determine the appropriate scope of such work.

3. to determine the organization and reporting relationships that are necessary.

4. to determine the personnel necessary for the performance of this function, and

5. to conduct operations research during this period.

The following is the month end summary of personnel:

	As of 9-30-54			As of 10-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	0	0	0	1	1	2	+1	+1	+2
Operations Research Analysts	0	0	0	5	0	5	+5	0	+5
TOTAL	0	0	0	6	1	7	+6	+1	+7

P. M. Thompson attended the Atomic Energy Commission Computer Council Meeting on October 19, and the meeting of the Institute of Management Sciences on October 21 and 22 in Pittsburgh, Pennsylvania. He visited the Aircraft Gas Turbine Division to study programming of the 701 computer for the production scheduling operations research program.

Production Forecasting and Scheduling

With the approval of the General Manager, an operations research program has been established to facilitate, and possibly improve, the preparation of production plans and forecasts. The use of linear programming techniques was investigated and found to be amenable to the solution of the problem. A tentative mathematical model of Hanford production operations was constructed which appears to adequately represent the true physical situation. Based on this model a detailed production planning calculation will be made, utilizing the method of linear programming and the IBM 701 computer available at the RAND Corporation. This computation should be completed by January 1, 1955.

When an adequate mathematical planning technique is developed it will have the following advantages:

1. The assumptions on which the plan is based will be determined explicitly.

2. The computation of many plans based on various quantitative assumptions will be relatively easy compared to manual methods.

3. Within the restrictions imposed by the model, the plan obtained will be optimum.

Transportation

An operations research study of transportation of personnel to and from the outer areas revealed that a car pool, located at the intersection where the main route divides into individual routes to the 100 and 200 areas, could eliminate two million miles of sedan travel annually between Richland and the intersection. This annual reduction in sedan milage is equivalent to 29 vehicles with an economic life of 65,000 miles. Replacement of sedan travel with shuttle bus service between Richland and the intersection will make possible a significant reduction in the cost of transporting personnel. An operations research report on this subject is in preparation.

Inventory Control

Consideration is being given to a mathematical model for inventory control. Little progress was made on this program because of concentration of mathematical talent on the production scheduling operations research during the month.

Shift Schedules

It has been suggested by the General Manager that a study of shift schedules might lead to an appropriate operations research program. The initial investigation concerning records pertaining to shift schedules is in progress.

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