

PRIVACY ACT MATERIAL REMOVED

727791

HW 33200 DEL

**DECLASSIFIED  
WITH DELETIONS**

Copy No.	Series
Pages 363	Copies

MONTHLY REPORT

56856

HANFORD ATOMIC PRODUCTS OPERATION

FOR

REPOSITORY

POOL

SEPTEMBER 1954

COLLECTION

Atmospheric Release

**DECLASSIFIED  
WITH DELETIONS**

Classification Canceled (Change to)

BOX No.

N/A

Compiled By  
DEPARTMENT MANAGERS

FOLDER

N/A

~~CLASSIFICATION REVIEW FOR  
DECLASSIFICATION BUT LEFT  
UNCHANGED~~

by Authority of

CG-PR-2

October 25, 1954

~~by J. J. Joyce  
Date 5/6/73  
U.S. Atomic Energy Commission~~

DS Lewis 5/19/92  
DG Kroemer 6/3/92  
PM Eck 6-3-92

RICHLAND, WASHINGTON

Operated for the Atomic Energy Commission  
by the  
General Electric Company  
under  
Contract #-W-31-109-eng-52

THIS DOCUMENT IS PUBLICLY  
AVAILABLE

Route To	Read By	Date
J. J. Joyce		
THIS DOCUMENT HAS BEEN SCANNED AND IS STORED ON THE OPTICAL DISK DRIVE		

**DECLASSIFIED  
WITH DELETIONS**

PRIVACY ACT MATERIAL REMOVED

215213

COPY NUMBER

DISTRIBUTION

1	F. K. McCune - Yellow Copy
2	K. H. Kingdon
3	K. R. Van Tassel
4	W. E. Johnson
5	J. E. Maider
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
12	300 File

**DECLASSIFIED**

DECLASSIFIED

TABLE OF CONTENTS

General Summary . . . . . A-1  
Staff . . . . . B-1  
Number of Employees . . . . . C-1 and C-2  
Personnel Distribution . . . . . D-1

Manufacturing Department . . . . . E-1 through E-4  
    Monthly Operating Report . . . . . Ea-1 through Ea-7  
    Metal Preparation Section . . . . . Eb-1 through Eb-6  
    Reactor Section . . . . . Ec-1 through Ec-13  
    *Separations Section* . . . . . *Fd*

Engineering Department . . . . . F-1 through F-5  
    Engineering Administration . . . . . Fa-1 and Fa-2  
    Pile Technology . . . . . Fb-1 through Fb-24  
    Separations Technology . . . . . Fc-1 through Fc-19  
    Applied Research . . . . . Fd-1 through Fd-22  
    Fuel Technology . . . . . Fe-1 through Fe-11  
    Design . . . . . Ff-2 through Ff-13  
    Project . . . . . Fg-2 through Fg-19  
    Advance Engineering . . . . . Fh-1

Employee and Public Relations Department . . . . . G-1 through G-3  
    Personnel Practices . . . . . Ga-1 through Ga-10  
    Employee Communications and Public Relations . . . . . Gb-1 through Gb-8  
    Union Relations . . . . . Gc-1 through Gc-4  
    Salary and Wage Administration . . . . . Gd-1  
    Education and Training . . . . . Ge-1 through Ge-8  
    Health and Safety . . . . . Gf-1 through Gf-14

Community Section . . . . . Gg-1  
    Maintenance and Renovation Unit . . . . . Gga-1 through Gga-6  
    Police Unit . . . . . Ggb-1 through Ggb-12  
    Community and Residential Property Unit . . . . . Ggc-1 through Ggc-9  
    Fire Unit . . . . . Ggd-1 and Ggd-2

Community Operations Sub-Section  
    Electrical Unit . . . . . Ggf-1 through Ggf-4  
    Engineering Unit . . . . . Ggg-1 through Ggg-4  
    Public Works and Recreation Unit . . . . . Ggh-1 through Ggh-3  
    Water and Sewerage Utilities Unit . . . . . Ggi-1 and Ggi-2  
    Richland Public Library . . . . . Ggj-1 and Ggj-2

Radiological Sciences Department . . . . . H-1 through H-16

Financial Department . . . . . I-1 through I-27

Plant Auxiliary Operations Department  
    Plant Protection Section . . . . . Ja-1 through Ja-26  
    Purchasing and Stores . . . . . Jb-1 through Jb-9  
    Transportation Section . . . . . Jc-1 through Jc-5  
    Telephone Section . . . . . Jd-1 through Jd-4  
    Electrical Utilities . . . . . Je-1 through Je-3  
    Operations Analysis Section . . . . . Jf-2 through Jf-14

[REDACTED]

MONTHLY REPORT  
HANFORD ATOMIC PRODUCTS OPERATION

SEPTEMBER 1954

GENERAL SUMMARY

PRODUCTION OPERATIONS

The net production for the month of acceptable slugs was 332 tons, which established a new production record.

Following the adoption of the Hanford Bare Slug Inspection Standards at Fernald on August 27, a marked improvement in bare slug surface quality has been noted, and the bare slug reject rate dropped to four percent in September as compared to 16 percent in August.

The plutonium output production was slightly below (2 percent) the forecast. This was due primarily to the gradual increase in high g/t goal concentrations to base plus 125 MWD/ton at all reactors except D and C. At the D Reactor the goal concentration was increased to base plus 225 MWD/ton to monitor rupture experience at the higher concentrations.

The monthly productions at the Redox and T Plants were 97 percent and 112 percent of the forecast respectively with the quarter production being 91 percent and 130 percent of forecast. Low g/t plutonium continued to be produced at the T Plant.

ENGINEERING TECHNOLOGY

For the first time it appears possible to analyze plutonium in a separations process feed solution by a direct chemical (coulometric) method. This opens up the possibility of a complete chemical material balance across a separations plant with elimination of discrepancies resulting from the use of a combined radioassay - chemical assay system.

The successful alpha phase extrusion of thirty-two unalloyed uranium billets was carried out by Bridgeport Brass at Adrian on August 31 and September 1. Examination of the extruded material showed the hole to be round and concentric within desired tolerance. From this extrusion trial the conditions necessary for production of hollow uranium rods with a 1/2 inch hole have been developed.

PERSONNEL AND SERVICES

Reduced salary rates for community firemen, resulting from a new agreement with the union effective September 13, 1954, were made effective during the month.

One major injury in Operations brought to an end the best safety record ever to be achieved by a General Electric plant, 214 days operation without a major injury. This represents more than 9,400,000 man hours. No major injuries occurred in the Community. Minor injuries continued low.

[REDACTED]

A-1

**DECLASSIFIED**

1215216

**DECLASSIFIED**

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
- Manager, Plant Auxiliary Operations . . . . . H. D. Middel

FOR



HANFORD ATOMIC PRODUCTS OPERATION

NUMBER OF EMPLOYEES

SEPTEMBER 30, 1954

	EXEMPT		OTHER		TOTAL	
	<u>9-30-54</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>8-31-54</u>
<u>Engineering Department</u>						
General	18	19	84	85	102	104
Design	176	175	121	121	297	296
Project	254	261	159	154	413	415
<u>Technical Section</u>						
General	10	10	3	3	13	13
Applied Research	116	121	53	54	169	175
Separations Technology	114	114	49	46	163	160
Pile Technology	107	105	60	65	167	170
Fuel Technology	64	65	76	81	140	146
Advance Technology	10	10	1	1	11	11
<u>Manufacturing Department</u>						
General	15	14	6	7	21	21
Reactor	282	277	1 217	1 202	1 499	1 479
Separations	282	280	1 266	1 259	1 548	1 539
Metal Preparation	99	97	501	498	600	595
<u>Plant Auxiliary Operations Department</u>						
General	1	1	1	1	2	2
Telephone	13	11	61	66	74	77
Transportation	42	44	449	448	491	492
Electrical Utilities	16	17	73	70	89	87
Purchasing & Stores	56	55	228	231	284	286
<u>Plant Protection</u>						
General	1	1	1	1	2	2
Patrol & Security	59	59	431	433	490	492
Safety & Fire	30	30	106	106	136	136
Office Services	13	13	183	194	196	207
Administration Mail Service	12	12	87	89	99	101
Operations Analysis	39	37	64	65	103	102
<u>Financial Department</u>						
Financial General	6	6	6	8	12	14
Costs & Budgets	27	27	97	100	124	127
General & Personnel Accounting	17	17	122	121	139	138
Property Accounting	16	15	42	43	58	58
Audits & Procedures	22	18	4	4	26	22
SF Accountability	6	6	21	21	27	27
<u>Employee &amp; Public Relations Department</u>						
Community	85	88	329	349	414	437
Health & Safety	56	56	202	208	258	264
Management	6	6	1	2	7	8
Salary Administration	10	10	11	11	21	21
Employee Relations	13	13	37	36	50	49
Public Relations	7	8	28	27	35	35
Union Relations	5	4	2	2	7	6
<u>Education &amp; Training</u>						
Staff	7	7	5	5	12	12
Others	-	-	45	62	45	62

	EXEMPT		OTHER		TOTAL	
	<u>9-30-54</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>8-31-54</u>
<u>Radiological Sciences Department</u>						
General	4	3	4	5	8	8
Records & Standards	25	26	140	144	165	170
Biophysics	56	58	63	59	119	117
Biology	34	33	38	37	72	70
Engineering	6	6	1	1	7	7
Legal	3	3	2	3	5	6
<u>Special Study</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>5</u>	<u>5</u>
Total	<u>2 243</u>	<u>2 241</u>	<u>6 482</u>	<u>6 530</u>	<u>8 725</u>	<u>8 771</u>

1215219

AREA PERSONNEL DISTRIBUTION  
SEPTEMBER 30, 1954

	100-B	100-D	100-F	100-H	100-K	101	200-E	200-W	300	700-1100-3000	TOTAL
	AREA	AREA	AREA AND	GENERAL							
<u>Engineering Department</u>											
Exempt	30	69	-	13	44		67	60	274	312	869
Other	15	31	2	59	12	20	20	30	218	219	606
Total	<u>45</u>	<u>100</u>	<u>2</u>	<u>72</u>	<u>56</u>	<u>87</u>	<u>87</u>	<u>90</u>	<u>492</u>	<u>531</u>	<u>1,475</u>
<u>Manufacturing Department</u>											
Exempt	63	58	63	74	19	18	18	260	101	22	678
Other	303	322	292	216	79	142	142	1,121	500	15	2,990
Total	<u>366</u>	<u>380</u>	<u>355</u>	<u>290</u>	<u>98</u>	<u>160</u>	<u>160</u>	<u>1,381</u>	<u>601</u>	<u>37</u>	<u>3,668</u>
<u>Plant Auxiliary Operations</u>											
Exempt	26	7	7	7	7	11	11	17	11	189	282
Other	54	49	80	57	69	67	67	162	110	1,025	1,684
Total	<u>80</u>	<u>56</u>	<u>87</u>	<u>64</u>	<u>76</u>	<u>78</u>	<u>78</u>	<u>179</u>	<u>121</u>	<u>1,214</u>	<u>1,966</u>
<u>Financial Department</u>											
Exempt				1	-	1	1	2	5	85	94
Other				2	2	-	-	1	18	269	292
Total				<u>3</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>23</u>	<u>354</u>	<u>386</u>
<u>Employee &amp; Public Relations</u>											
Exempt		2	-	1	-	4	2	2	2	178	189
Other	4	8	6	3	1	4	9	21	21	604	660
Total	<u>4</u>	<u>10</u>	<u>6</u>	<u>4</u>	<u>1</u>	<u>8</u>	<u>11</u>	<u>23</u>	<u>23</u>	<u>782</u>	<u>849</u>
<u>Radiological Sciences</u>											
Exempt	2		35			2		17	57	12	125
Other	5	41	41	7		7	20	20	155	18	246
Total	<u>7</u>	<u>76</u>	<u>76</u>	<u>7</u>		<u>9</u>	<u>37</u>	<u>37</u>	<u>212</u>	<u>30</u>	<u>371</u>
<u>General</u>											
Exempt		136	105	96	70	103	103	358	450	804	2,243
Other		410	421	337	163	240	240	1,343	1,022	2,154	6,482
Total		<u>546</u>	<u>526</u>	<u>433</u>	<u>233</u>	<u>343</u>	<u>343</u>	<u>1,701</u>	<u>1,472</u>	<u>2,958</u>	<u>8,725</u>

1215220

MANUFACTURING DEPARTMENTSEPTEMBER, 1954METAL PREPARATION SECTION

The net production for the month of acceptable slugs was 332 tons, which established a new production record. The monthly production was 96 percent of the official forecast due to lower than anticipated yields because of poor bonding and subsequent rework. The canning yield was 76 percent in September as compared to 81.4 percent in August. The quarterly production was 96 percent of the official forecast because of low material receipts in the early part of the quarter and low yields resulting from poor bonding in September.

There were no autoclave failures during the month.

Following the adoption of the Hanford Bare Slug Inspection Standards at Fernald on August 27, a marked improvement in bare slug surface quality has been noted, and the bare slug reject rate dropped to 4 percent in September as compared to 16 percent in August.

REACTOR SECTION

The total monthly input plutonium production was 133 percent of the forecast. The higher than forecasted production was due to improved reactor time operated efficiency, postponement of a two weeks venturi and horizontal rod work outage at the D Reactor, and a one week outage for pigtail replacement at the C Reactor. The input production for the quarter was 116 percent of forecast.

The overall reactor operating efficiency was 91.6 percent which was the highest efficiency during the past twelve months.

There were no increases in the established maximum operating levels of the reactors.

One regular uranium slug rupture occurred during the month. In addition, one thorium slug and one enriched slug (not confirmed) also ruptured. The total outage time resulting from these ruptures was 30.2 hours.

The plutonium output production was slightly below (2 percent) the forecast. This was due primarily to the gradual increase in high g/t goal concentrations to base plus 125 MWD/ton at all reactors except D and C. At the D Reactor the goal concentration was increased to base plus 225 MWD/ton to monitor rupture experience at the higher concentrations. The C Reactor remained on the low concentration program. Tonnages of low and other concentrations material discharged was 203 and 15 tons respectively.

During September, 15 reactor scrams occurred. Of these, four were caused by normal Panellit system difficulties. Other scrams were as follows: five at H Reactor from tube 0961 (Recirculation Studies) while controlled boiling in the tube was attempted; three

DECLASSIFIED

REACTOR SECTION (Continued)

Beckman trips occurred, two at C and one at F Reactor; two scrams at B resulted from the B-C tie-in and the C Reactor trips, and a third resulted from a burned out holding relay on #2 safety circuit. The total outage time charged to these scrams was 35.8 hours. Of this, 20 hours were charged for the balance of an outage which began in August as the result of a Panellit scram and continued into September.

Two process leak testing programs occurred in September. At F Reactor, based upon increasing water collection rates, approximately 830 process tubes were leak tested. Five rear nozzle flange leaks were found and were corrected by tightening the nozzles. Start-up from this outage was made September 30, precluding month end confirmation of these leaks as the cause of the increased water collection rate. At H Reactor, also on the basis of increasing water collection rates, a process tube leak testing program was started late in the month. At month end, the testing program was continuing, with approximately 450 tubes tested and no leaks determined. The F Reactor leak testing program required approximately 30 outage hours. At month end, approximately 10 outage hours had been devoted to the H Reactor program.

Horizontal rod experience during September was excellent. No rods were removed from service, and maintenance was limited to flushing rods at C Reactor to remove sediment accumulations. An increase in exit cooling water pressure was noted following the flush, although three of the rods remained within three pounds of the low pressure limit. No change occurred in the status of D Reactor horizontal rods. No. 7 remains out of service, and No. 5 continues in limited operation due to binding at the 160-inch position.

The tritium input production was 36 percent over the forecast because of the high DR Reactor operating efficiency of 100 percent. The charging of thorium tubes at a greater than forecast rate in August and September contributed to the higher than forecast input production for this product.

The offsite shipment of J slugs continued during September.

SEPARATIONS SECTION

The monthly productions at the Redox and T Plants were 97 percent and 112 percent of the forecast respectively with the quarter production being 91 percent and 130 percent of forecast. Low g/t plutonium continued to be produced at the T Plant.

A production rate of approximately 7 tons/day was maintained in the Redox Plant during the first part of the month; however, it was necessary to reduce the rate to 6 tons/day after the loss of the D-13 (waste receiver) agitator, weight factor and discharge jet on September 7, 1954, when a vapor phase reaction took place in the tank. A 48-hour shutdown started on 9-12-54 was taken to inspect the waste receiver tank and effect repairs; however, no corrective action was taken as the top of the tank was so distorted that it was impossible to effect repairs short of replacement of the vessel. With the defective D-13 equipment, the rate was limited to 6 tons/day for the remainder of the month. Two other shutdowns, 17 hours on 9-18-54 and 26 hours on 9-22, 9-23-54, were necessary to replace a faulty head-end transfer jet and to rework a head-end batch.

DEL

SEPARATIONS SECTION (Continued)

Operations at the T Plant during the month were essentially normal. A 12 percent increase in the capacity of the extraction cycle was obtained, without affecting the quality of the final product, by increasing chemical addition rates and reducing digestion periods.

The TBP Plant monthly production was 157 percent of the forecast and the quarterly production was 142 percent of forecast. The production was higher than the forecast due to a continuation of parallel operations with no outage being required as forecast to prepare the plant for series operation. The total outage time for the month was 118 and 114 hours respectively for the A and B Lines. These outages were taken for line flushes and minor maintenance. In addition to the regular tank farm feed material, the plant processed 92 tons of out of specification Redox UNH. On a trial basis the plant was unsuccessful in decontaminating 2.2 year old metal in a 3 - 4 percent feed blend with older material.

The  $UO_3$  production was 110 percent of the forecast for the month and 110 percent for the quarter. Only minor quantities of Redox UNH was received during the month, and the feed material for  $UO_3$  was principally from TBP. A total of 10 cars of powder was shipped offsite.

The 234-5 production of shapes for the quarter was 105 percent and 100 percent for the large and small models. The production of unfabricated buttons was 100 percent of forecast for the quarter. The quarterly production of nitrate was 114 percent of the forecast.

The waste evaporators operated with volume reductions of 41 percent and 29 percent at B and T plants respectively.

Removal of metal waste from underground storage was decelerated as availability of older metal wastes decreased. The BX farm supplied a large portion of the TBP feed material with TX furnishing a small amount. Sluicing of green material halted in mid-month following the unsuccessful decontamination in TBP.

GENERAL

Personnel

Total on Roll September 1, 1954	3639
Accessions	63*
Separations	30*
Total on Roll September 30, 1954	3672

\*Does not include intra department transfers.

*J. E. Maider*  
 J. E. MAIDER, MANAGER  
 MANUFACTURING DEPARTMENT

E-3

DECLASSIFIED

DECLASSIFIED

HW-33200 DEL

MANUFACTURING DEPARTMENT  
PATENT REPORT SUMMARY  
FOR  
MONTH OF SEPTEMBER, 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.

<u>INVENTOR</u>	<u>TITLE</u>
W. W. Culbert, Separations Section	"Evaluation of a suggestion submitted through the Suggestion System by a welder, W. W. Culbert, who has since terminated, reveals the possibility that the type of cutting torch he proposed may possibly be patentable."
Reed Overson, Separations Section) B. W. Marsh, Separations Section)	"Portable bulk materials dispensing hopper handled by a fork lift truck."

*J. E. Maider*  
J. E. MAIDER, MANAGER  
MANUFACTURING DEPARTMENT

MONTHLY OPERATING REPORT  
SEPTEMBER 1954

1215225

SECRET  
Ea-1

**DECLASSIFIED  
WITH DELETIONS**

**DECLASSIFIED** LCL  
-33200  
**WITH DELETIONS**

  
Ea-2

121522b

[REDACTED]

1215227

[REDACTED]  
Ea-3

**DECLASSIFIED  
WITH DELETIONS**

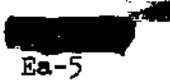
**DECLASSIFIED** -33200 UCL  
**WITH DELETIONS**

1215228

**[REDACTED]**  
Ea-4



1215229



Ea-5

**DECLASSIFIED  
WITH DELETIONS**

**DECLASSIFIED  
WITH DELETIONS**

HW-33200 ~~UCL~~ ]

**Es-6**

1215230

HW-33200

DEL

  
Ea-7

**DECLASSIFIED  
WITH DELETIONS**

1215231

October 6, 1954

MANUFACTURING DEPARTMENT  
METAL PREPARATION SECTION  
September, 1954

I. RESPONSIBILITY

There was no change in responsibility during this period.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	<u>September</u>	<u>August</u>	<u>Year to Date</u>
Acceptable Pieces Canned (8") (Tons) Gross	332	324	2157
Acceptable Pieces Canned (8") (Tons) Net	332	318	2140
Canning Yield (8") (%)	76.0	81.4	80.0
Total Acceptable Pieces Canned (Tons) Gross	332	324	2287
Total Acceptable Pieces Canned (Tons) Net	332	318	2266
Acceptable Pieces Canned (% of Forecast)	96	101	93
Autoclave Frequency (8") (No./M)	.00	.00	.01
J-3 Slugs Canned (pieces)	0	0	35964
N Slugs Canned (pieces)	0	0	33177
Chem. 10-66 Canned (pieces)	0	2646	8895
Special Request (man hours)	164	1135	5406
305 Routine Tests (man hours)	176	198	3033
305 Special Tests (man hours)	618	479	7669
Average Steam Generated (M lbs/hr)	26.7	23.7	
Maximum Steam Generated (M lbs/hr)	71.0	53.0	
Total Steam Generated (M lbs)	19300	17500	
Coal Consumed (Tons)	1170	1155	
Sanitary Water from 3000 Area (Million Gals.)	63.4	61.0	
Total Water from 3000 Area (Average Rate--GPM)	1468	1367	

1215232

Eb-1

**DECLASSIFIED**

## 2. Activities

The net production of acceptable slugs reached a new high of 332 tons for the month. The canning yield dropped to 76% from 81.4% for the previous month. The majority of rejections were due to poor bonds and this reject category increased nearly 7%. Porosity in the bonding layer began suddenly and appeared to be caused by out-gassing of the slug. There seemed to be a strong correlation in those instances of greatest porosity with increased hydrogen content of the bare slugs. The higher hydrogen content appeared to be a result of recent changes in the heat treating operation at Fernald. A remedial program is in progress. Extensive investigation into this problem, both at Hanford and Fernald, was still in progress at month-end.

Five canning lines operated during the month with full relief.

No autoclave failures occurred during the month.

On August 27, the National Lead Company adopted the Hanford Bare Slug Inspection Standards at Fernald. Since adoption of the new standards at Fernald, a marked improvement in bare slug surface quality has been noted, with a total rejection rate of 4% for September. Heat treated slug rejection rate was only 1.4%. This confirms the assumption that was reached in August, then based on short experience, that the number of reject slugs returned to Fernald would decrease considerably. It is believed that the heat treating operation on the finished slug tends to accentuate surface defects slightly which may account for the difference in reject rates between the two types of material.

Approval was obtained and procedures initiated for recovery of lathe scrap for use as canning metal. Estimated savings will be reported as soon as sufficient experience has been gained.

Two shipments of cans were received which were found by statistical inspection to be thirty percent defective because of thin can walls. The 100% inspection which necessarily followed confirmed very closely the statistical inspection findings.

## 3. Special Operations

The new hot press facilities in the 313 Building were utilized in the canning of aluminum dummies and enriched uranium-aluminum alloy fuel slugs but problems in blistering and excessive flash were encountered. The hot press canning of this material has been temporarily curtailed due to reduced requirements and the aforementioned problems. Major effort is being directed toward the correction of these problems.

The salt bath heat treating operation continued as scheduled.

## 4. Schedule Variance

Acceptable canned slug production was four percent below forecast due to lower yield than anticipated and insufficient autoclave capacity at month-end, which resulted in a build-up of in-process inventory. This situation will be relieved when the new autoclaves in the 313 building become available. The training of new operators for additional production lines accounted somewhat for the increased reject rate.

1215233

**B. Equipment Experience****1. Operating Continuity**

The canning line efficiency was 94% which was an increase of one percent over August. Less down time for emergency maintenance and more efficient utilization of manpower with close follow-up with Maintenance contributed to this improvement.

**2. Inspection, Maintenance and Replacements**

The "kit" method of replacing dull lathe tools was adopted for facing tools used in 313 building. Through color-coded boxes, tools are presorted when returned to the shop for regrinding. It is estimated that this method has reduced set-up and regrinding time by approximately 75%.

Fabrication of a continuous dissolver was started in 321 building. This equipment will be used to measure dissolution rates of metals.

A water tie-in was completed September 21 to supply water service to the new building being constructed between 314 and 305 buildings in the 303 Area. Shop tests of the automatic capping machine were satisfactory and the machine will be tested on a hot furnace. The electrical hi-lift battery charging installation in 313-K building was completed and placed in service this month.

**C. Improvement Experience****1. Production Tests**

PT-313-41MT "Fabrication of Unbonded Uranium Slugs" (HW-32378)

Two hundred fifteen unbonded eight-inch fuel elements were canned by the "C" process. Approximately 195 cored unbonded slugs and 200 lead dip control slugs remain to be canned under this test.

PT-313-44MT "Canning of Cored Eight-Inch Slugs From Extruded Hollow Rods" (HW-32  
Fifty-five eight-inch cored slugs fabricated from hollow alpha extruded rods were canned without incident. Forty-one were acceptable for pile charging.

PT-313-46MT "Irradiation of Uranium 1.5 Atomic Percent Silicon Alloy Slugs"  
(HW-32907)

Forty-two uranium silicon alloy slugs (1.5 atomic percent silicon) were canned and 29 were acceptable for in-pile evaluation.

**2. Process Tests and Revisions**

No activity.

**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 Costs1. Labor Variance

Poor yields resulted in a slight increase of direct labor costs.

2. Material Variance

Lower yields, increased in-process inventory and increased consumption of sleeves resulted in an appreciable increase in unit cost.

3. Other

Increased production was responsible for a decrease in other costs. Total unit costs increased .005 over the previous month.

E. Plant Expansion1. Project StatusProject CA-514 "Expansion of 300 Area Production Facilities"

Design of the over-all project is 99% complete and over-all field construction is 61% complete. Total funds authorized for the project remain at \$5,085,000. Project costs as of September 12, including commitments, are approximately \$3,087,686. Directive completion date remains as March 1, 1955.

Phase II, 313 Building Addition is nearly 100% complete. Modification of the existing building (Phase III) is approximately 52% complete. The installation of process equipment (Phase IV) is approximately 39% complete. Work on the Manufacturing offices and building alterations for 3707-A, 3707-B, and 3706 buildings is 27% complete. A portion of the office space is expected to be occupied by the Power and Maintenance Sub-section early in October. Work on general supporting facilities is about 74% complete.

Project CG-573 "Hanford 3X Program - 300 Area"

Project authorized funds total \$860,000. Total costs plus commitments are now \$842,000. A work order has been issued to Minor Construction for the completion of exceptions to this project. Field program is 99% complete.

Project CA-590 "Fly Ash Collection Equipment - 384 Building"

This project was rejected by the A.E.C. for insufficient data on the number of eye injuries resulting directly from fly ash. Data on the number of foreign bodies attributable to fly ash have been gathered by Industrial Medicine and a reply to the A.E.C. is being prepared.

2. Plant Engineering

The breeching leading to the stack at the 300 Area Power House was sand blasted and then painted with one coat of high heat resistant paint. A second coat will be applied.

General area ground improvement including leveling, grading, weed removal operations and soil stabilization with crushed stone has been accomplished during the month.

2. Plant Engineering (continued)

Plans are being made to fence 3701 building out of the area. The building will be used by Radiological Sciences as a survey checking station to monitor vehicles and equipment leaving the controlled area.

F. Significant Reports Issued1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-32940	Monthly Report, Process Sub-section, Metal Preparation Section, August, 1954	EW O'Rorke	9-2-54

2. Non-Routine

HW-32936	General Analytical Control Program I Sample Identity, MCW	PR Anderson	9-2-54
HW-32937	General Analytical Control Program I Sample Identity, NLO	PR Anderson	9-2-54
HW-32973	Enriched Alloy Slug Cores-Extruded Slug Fabrication	TD Naylor	9-7-54

III. PERSONNELA. Organization

No change.

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	2	0
Operations	188	186	- 2
Power and Maintenance	310	318	+ 8
Process	86	82	- 4
Projects & Personnel Development	10	11	+ 1
Section Total	596	599	+ 3

C. Safety Experience

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

D. Radiation Experience

There were no exposures in excess of 300 mrad reported during the month.

E. Personnel Activities1. Visits and Visitors

S.M. Gill visited the National Lead Company at Fernald to investigate variables in the uranium heat treating operation.

1. Visits and Visitors (continued)

E.W. O'Rourke visited the Bridgeport Brass Company, Bridgeport, Connecticut; National Lead Company, Cincinnati, Ohio; Y-12 Plant, Oak Ridge; and the Aluminum Company of America at Edgewater, New Jersey to discuss quality aspects of fuel elements.

W.A. Shanks attended the Instrument Society of America's National Conference in Philadelphia, Pennsylvania this month.

W.M. Mathis visited the Bridgeport Brass Company's extrusion plant at Adrian, Michigan to discuss the availability of cored metal with A.E.C. representatives and also attended a demonstration of cored extrusion of uranium.

J.W. Nageley visited vendors in Seattle, Tacoma and Yakima to assist vendors of manufacturing equipment for project CA-514.

2. Meetings

The Safety Training Program for Supervisors was presented during the month and thirteen members attended.

Fourteen information meetings were held during September. These included two round table discussion meetings with shift supervisors.

One exempt member of the Section attended the first session of the Work Simplification Training Course conducted by the Separations Section.

Eleven exempt members of the Section attended supervisory training courses.

Richland, Washington  
October 7, 1954

MANUFACTURING DEPARTMENT  
REACTOR SECTION  
MONTHLY REPORT  
SEPTEMBER, 1954

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

Total reactor input production in September established a new record high for the third consecutive month, 1.1 per cent above August, a 31-day month. Reactor time operated efficiency improved significantly during September to 91.6 per cent, the highest since August, 1953. Total plutonium, U-235 and thorium input productions were 134.7, 133.5, 135.6 and 182.6 per cent, respectively, of forecast as the result of the higher than forecast time operated efficiency, and generally slightly higher than forecast operating levels.

Total and plutonium forecast input productions were also beneficially influenced by the postponement of a two-week venturi and horizontal rod outage at D Reactor, and a one-week pigtail replacement outage at C Reactor, both of which had been included in the September forecast.

1215238

**DECLASSIFIED**

DECLASSIFIED

A. Operating Experience (Continued)

Input Mint production was above forecast primarily as the result of a 100 per cent time operated efficiency at DR Reactor during September. Charging of J-Q tubes at a greater than forecast rate in August and September also contributed to the above forecast thorium input production. Input production devoted to the Mint program was 49.3 and 2.0 per cent at DR and C Reactors, respectively. Input production devoted to the J-Q program was 8.0 and 6.1 per cent at H and C Reactors, respectively.

Plutonium output production was slightly below forecast in September primarily because of gradually increasing goal concentrations, to 125 megawatt days above base goal as of September 1, and by 50 megawatt day increments at three month intervals thereafter until operating continuity, based largely on ruptured slug incidence, becomes unsatisfactorily low. At D Reactor, beginning in September, goal concentration was increased to base goal plus 225 megawatt days to secure experience at higher concentrations more rapidly than the general program. C Reactor remains on the low concentration program. This resulted in uranium remaining in the reactors longer than had been forecasted based on a goal concentration of base goal plus 75 megawatt days. Plutonium output production in September was approximately one-half the first quarter FY 1955 average production because of the large-scale discharge of production concentration material at C Reactor in July in completing the conversion to a low concentration program there, and the greater than forecast discharge of four-inch production concentration material in August to minimize the opportunity for slug ruptures. Tonmages of low and production concentration material discharged in September were approximately 205 and 15, respectively.

Operating levels were generally approximately the same as in August, with no new maximum levels established.

September slug ruptures totalled three, one 10-66 material rupture at B Reactor, and one eight-inch uranium rupture, and one suspected "C" material rupture, which had not been confirmed at month end because of unavailability, at C Reactor. This represents the lowest number of uranium and total ruptures since July, 1953. The suspected "C" material rupture listed in the August report has not yet been examined for confirmation due to a breakdown of viewing facilities. The total outage time resulting from the three September ruptures was approximately 30 hours.

A. Operating Experience (Continued)

1. Statistics

	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total or Average</u>
Reactor Time Operated Efficiency (%)	88.7	78.6	99.9	100.0	87.8	94.7	91.6
Reactor Outage Time (Hrs)							
Plutonium Production	52.1	127.7	1.0	0	74.0	23.0	277.8
Special Irradiations and Tests	<u>29.2</u>	<u>26.5</u>	<u>0</u>	<u>0</u>	<u>13.9</u>	<u>15.5</u>	<u>85.1</u>
Total	81.3	154.2	1.0	0	87.9	38.5	362.9
Reactor Unscheduled Outage Time (Hrs)	81.3	2.6	1.0	0	59.4	38.5	182.8
Metal Discharged (Tons)	5.0	189.7	0	0	6.2	17.5	219
Water Quality (ppm Iron)							
Raw Water - Average	0.08	0.07	0.05	0.06	0.06	0.08	--
Raw Water - Maximum	0.15	0.10	0.11	0.13	0.08	0.15	--
Process Water - Average	0.008	0.011	0.009	0.006	0.008	0.006	--
Process Water - Maximum	0.016	0.025	0.016	0.011	0.012	0.011	--
Water Pumped (MM Gals)							
Bldg. 190 to Reactor	1953	3244	2080	1832	1827	2173	13109
Bldg. 182 to 200 Areas	413						413
Bldg. 181	6270		4628		2208	2502	15608
Steam Generated (MM lbs)	154		230		131	107	622
Coal Consumed (Tons)	9310		14101		7678	6761	37850

2. Activities

Operation continued to be limited by a 95C process tube outlet water temperature limit at all reactors except B where a 100C limit was permitted by Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits."

An additional 30 tubes of J-Q material were charged into C Reactor for a total of 150 J-Q tubes there. No additional tubes were added during September to the 160 J-Q tubes in H Reactor.

Shipment of irradiated "J" slugs from DR and H Reactors to Arco, Idaho continued during the month, with 22 casks containing approximately 6,070 pieces shipped.

The new 30-inch, 100 to 200 Area export water line between Valve Houses 901 and 2901 was placed in service during September.

DECLASSIFIED

DECLASSIFIED

A. Operating Experience

2. Activities (Continued)

The 1954 program of third party inspection of all 100 Area pressure vessels, which has been in progress since the beginning of the year, was completed in September by a representative of the Travelers Insurance Company.

Analysis of daily process water composite samples, and of the weekly filtered samples from each of the 100 Area water plants was discontinued during September.

A. E. C. approval was obtained during September to proceed with the Reactor Section rescue training program. Work requests for the necessary equipment have been issued, and the buses to be converted to rescue vehicles have been released by Transportation.

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

	<u>Tubes Charged</u>	<u>Tubes Discharged</u>	<u>Casks Shipped</u>
Chemical 7260	0	1	0
Chemical 1066	0	0	21
Production Tests	65	7	4
Total	65	8	25

B. Equipment Experience

During September, 15 reactor scrams occurred. Of these, four, one each at B, C, D, and F Reactors, were caused by normal Panellit system difficulties. This represents a significant decrease in the number of scrams of this type as compared with recent months. Since operating conditions were normal, and since no special attention was devoted to the Panellit systems during September, the improved performance may be the cumulative result of the routine monthly reliability checks of the systems. Five scrams at H Reactor were caused by recirculation tube 0961-H (PT-105-506-E, Supplement B-2, "Recirculation Studies") while attempting controlled boiling in the tube. Three Beckman scrams, two at C Reactor and one at F Reactor occurred. One of these scrams at C Reactor was caused by a burned out tube. The causes for the other two Beckman scrams were not determined. Two scrams at B Reactor resulted through the B-C Reactor inter-tie from the C Reactor Beckman scrams. One scram at B Reactor resulted when a coil on the holding relay in the No. 2 safety circuit burned out. Total time charged to scrams in September was 35.8 hours. Of this, approximately 20 hours was charged for the balance of an outage which began in August as the result of a Panellit scram and continued into September.

B. Equipment Experience (Continued)

Two process leak testing programs occurred in September. At F Reactor, based upon increasing water collection rates, approximately 830 process tubes were leak tested. Five rear nozzle flange leaks were found. These leaks were corrected by tightening the nozzles. Start-up from this outage was made September 30, precluding month end confirmation of these leaks as the cause of the increased water collection rate. At H Reactor, also on the basis of increasing water collection rates, a process tube leak testing program was started late in the month. At month end, the testing program was continuing, with approximately 450 tubes tested and no leaks determined. The F Reactor leak testing program required approximately 30 outage hours. At month end, approximately 10 outage hours had been devoted to the H Reactor program.

Horizontal rod experience during September was excellent. No rods were removed from service, and maintenance was limited to flushing rods at C Reactor to remove sediment accumulations. An increase in exit cooling water pressure was noted following the flush, although three of the rods remained within three pounds of the low pressure limit. No change occurred in the status of D Reactor horizontal rods. No. 7 remains out of service, and No. 5 continues in limited operation due to binding at the 160-inch position.

Revisions are being made in the hot water recirculation systems at B, D, DR, and F Reactors to eliminate the severe line hammer when the systems are used. Similar revisions were completed at H Reactor during September.

Reliability checks of four of the Panellit systems during September revealed 121 faulty trips. By reactor these were:

	<u>High</u> <u>Trips</u>	<u>Low</u> <u>Trips</u>	<u>Total</u>
F Reactor	33	11	44
B Reactor	12	1	13
C Reactor	5	3	8
H Reactor	<u>26</u>	<u>30</u>	<u>56</u>
Totals	<u>76</u>	<u>45</u>	<u>121</u>

Of the 56 faulty trips at H Reactor, 43 were found to have been caused by corroded pivots. In an effort to reduce or eliminate this cause of failure, approximately one-third of the H Reactor gage pivots were lubricated with watch oil as recommended by the gage manufacturer.

Checks were not made at D or DR Reactors during the month because of insufficient outage time. At B Reactor, all Panellit gage range bases were checked in conjunction with Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits." Seventy-five

DECLASSIFIED

**DECLASSIFIED****B. Equipment Experience (Continued)**

gages were found to be in error by 10 psi or more which resulted in a narrower range and more conservative limit than the limit allowed by the correct range. Fifty per cent of the errors were the result of gages being off calibration.

There were no Building 190 process water pump motor failures during August.

The Westinghouse speed decelerators on Nos. 10 and 12 Building 190-H process water pump units failed during September. No. 10 unit was repaired, but No. 12 unit remains out of service because of a lack of spare parts. Loss of this pump reduces the backup facilities to a critical point since the remaining spare pump is not considered reliable. As a result, two new sets of gears and one reworked set are being made up at the Puget Sound Naval Shipyard, with delivery of the reworked gears promised in eight days as compared to an "emergency" delivery date of four months from the vendor, Westinghouse:

When the 230KV loop was opened between 100-B Area and Midway Sub-Station on September 21, to permit wave trap adjustment for the 100-K Area facilities, resulting low voltage conditions caused the following difficulties.

1. B Reactor safety circuits failed to "pick up," delaying start-up.
2. One Building 181-B 450 HP pump motor dropped off the line when the thermal overload elements functioned.
3. The C Reactor Brown recorder on the temperature monitor system failed to function.
4. A 15 HP air conditioner motor at B Reactor burned up as a result of overload elements not being correctly connected.

These and similar conditions are under study by the Maintenance Sub-Section with the objective of providing recommendations to solve the low voltage problems that are anticipated in connection with start-up of 100-K Area facilities which will essentially double the electrical load.

**C. Improvement Experience**

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

C. Improvement Experience (Continued)

- PT-105-4-MR (Poison Column Control Facility)  
Suppl. C At DR Reactor, one tube of Mint material was flushed without incident during September while operating. A production gain of approximately 150 megawatt days was achieved as the result of improved flattening.
- PT-105-8-MR (Uranium Charging During Reactor Operation)  
Metal which had previously been charged during operation was also discharged during operation. Subsequent examination of the metal revealed no significant difference from metal charge-discharged in the normal manner.
- PT-105-506-E (Recirculation Studies)  
Suppl. C The revised loop continued to operate during September at H Reactor. Controlled boiling was attempted five times in tube 0961-H, and five reactor scrams resulted amounting to 1.7 hours of outage time. During one attempt, boiling was accomplished for approximately two minutes before the scram occurred. No further boiling tests are planned until the system has been further revised.
- PT-105-567-A (Preliminary Irradiation of J-Q Columns)  
PT-105-579-A (Quantity Irradiation of J-Q Columns)  
Irradiation of the 12 test J-Q tubes remaining in H Reactor following discharge of one tube in August continued without incident in September. An additional 30 J-Q tubes were charged at C Reactor for a total of 150 J-Q tubes. These tubes, together with 148 J-Q tubes at H Reactor, total 298 tubes of the approximate 400 tube J-Q program planned.
- PT-MR-105-24 (High Rate Water Treatment at Post CG-558 Flows)  
This test was started at Building 183-D during September to evaluate and resolve the water control problems which will result from the increased flows following completion of Project CG-558, "Reactor Plant Modification for Improved Production." The north half of the filter plant is being used to treat approximately 42,000 gpm with six filters at a rate of six gpm per square foot of filter area. Results to date have been excellent with 12 hour filter runs.
- PT-105-562-A (Slug Evaluation at Increased Levels for Tritium Production)  
Twenty-eight of the remaining 40 J-N tubes in C Reactor were discharged during September in accordance with the test schedule.

DECLASSIFIED

C. Improvement Experience (Continued)

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 at H Reactor during September without incident.

PT-MR-105-18 (Flash Mixer Test - 100-C Area)  
 The flash mixers at Buildings 183-C and DR were removed from service at the end of September on the basis of results from this test which indicated that under water conditions encountered during 1954, the mixers were of no advantage in the processing of water.

Three revised Process Standards - Reactor were approved and issued during September. These were standards titled: "Water Pressure Trip Settings," "Vertical Rod Withdrawal - Rate and Waiting Period," and "Rate of Control Rod Withdrawal and Power Rise During Start-Up." The most significant change involved permitting partial withdrawal of horizontal rods while vertical rods are in the reactor, when this can be done safely prior to hot start-up, in order to facilitate recovery from scrams.

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

D. Events Influencing Costs

Reactor Section costs during September were beneficially influenced by continued improved raw water quality which resulted in decreased filter plant chemical and sodium dichromate costs amounting to approximately \$3,500. Reactor maintenance costs continued to be adversely affected by process tube leaks which in September, as in August, required two major tube testing programs. Beneficially affecting Reactor Section costs from the maintenance standpoint were the improved slug rupture and horizontal rod performances. Only one of the three ruptured slugs required appreciable outage time, and no significant horizontal rod maintenance was required during September. In addition, costs were favorably influenced by decreases in payroll and similar charges based on a 30-day month.

Preliminary estimates indicate that both plutonium irradiation and total irradiation unit costs are expected to be essentially the same as in August, although some small decrease in both unit costs may reasonably be expected as the result of increases of 0.6 and 1.1 per cent in plutonium and total production as compared to August. New record low unit costs for both plutonium and total irradiation were established in August.

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

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, Information Requests and Budget Items," F. A. R. Stainken to I. H. Warren, dated 9/20/54.

CA-512 (100-K Facilities)

Construction completion percentages for the K Reactors and Water Plants estimated by the A.E.C. as of September 17, are:

KW Reactor	99.3 up 3.3
KE Reactor	83.8 up 4.8
General Facilities	90.0 up 3.9
KW Water Plant	98.6 up 0.6
KE Water Plant	89.9 up 3.9

At KW Reactor, acceptance testing of vertical safety rods was in progress with some difficulties experienced. Main problems centered about scoring of cylinders by grit, inadequate air supply and cylinder denting by centering screws. Appropriate action has been taken to solve these problems. The dynamic flow test of reactor process water piping revealed leaks in approximately two-thirds of the Allen plugs on venturi assemblies. Insertion of Teflon gaskets under the plug is in progress.

A re-designed Building 190-K secondary process pump casing, cast into two parts subsequently welded together, was examined and found to be satisfactory.

CA-431 (100-C Plant)

B Reactor effluent flow diversion to the 107-C effluent sewer continues to delay 107-C East Basin repairs which have been rescheduled for March, 1955, to coincide with the planned B Reactor horizontal rod replacement outage. The Reynolds Aluminum Company continues to have die problems, and no successful C Reactor horizontal rod extrusions have yet been produced.

Two hundred replacement pigtails were received, but were equipped with incorrect adaptor fittings. Substitute acceptable fittings are to be shipped air express on October 1.

DECLASSIFIED

E. Plant Development and Expansion (Continued)

CG-558

(Reactor Plant Modification for Improved Production)

Scope design for Project CG-558 (Reactor Plant Modification for Increased Production) is estimated to be 83.7 per cent complete. Current estimates indicate that the horizontal rod replacement phase of this project will be delayed until after February of 1955 as a result of Alcoa's inability to extrude rod sections which are dimensionally acceptable. The vendor of boron carbide rings is also having difficulty in meeting schedules.

The tentative shutdown schedule that will be included in the revised Project Proposal will move major outages back 8½ months to begin about September, 1956. The outages will still be eight weeks per area, and are planned to be in a B, DR, and D sequence.

2. Plant Engineering

A number of engineering and development studies were active in the Section during September. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in document HW-33263. Several items of interest are reported below.

Studies related to the replacement of burned-out graphite stringer thermocouples, as described in the July and August reports, continued during December along two aspects of the problem: (1) thermocouple and insulation materials, and (2) the location and requirements of a front face connection box for the thermocouple and lead wire connections. A new design is being developed to correct the weak points disclosed through use of the present thermocouple system.

A method for detecting leaking process tubes, utilizing the helium leak detector, has been proposed. Basically, the idea considers obtaining a vacuum in the tube to be tested, and attempting to draw a helium-containing, leak-indicative sample of pile atmosphere from the tube. Active investigation of this proposal is planned.

Noise studies in Buildings 190-C and H continued during September. Analysis of test data indicated that sufficient noise reduction was achieved by a partial enclosure erected over a secondary process water pump motor to warrant further investigation of the applicability of modified acoustically treated shrouds over the ventilation ports of the Building 190-H electric motors. An evaluation of the Ultra-Coustic material installed on the walls of the bay between Nos. 10 and 11 pump foundations in the

E. Plant Development and Expansion (Continued)

Building 190-C basement showed a significant reduction in most octave-band intensities, although the resultant noise levels indicated that further attenuation will be required before the noise conditions can be designated as not requiring ear protection. Consequently, covering of the process water piping is being investigated in conjunction with wall insulation.

In the study of coal utilization, high speed motion pictures have confirmed the previously predicted "envelope effect" surrounding burning coal particles. In addition, a coal utilization engineering test, designed to evaluate mechanical changes to be recommended in coal handling and boiler equipment, is being prepared.

F. Significant Reports

1. Routine

Monthly operating reports issued for August were:

HW-32889-A	Reactor Section	J.H. Warren	9/8/54
HW-33027	Operations Sub-Section	R.O. Meham	9/10/54
HW-32944	Process Sub-Section	O.C. Schroeder	9/1/54
HW-32914	Projects and Personnel Development	F.A.R. Stainken	9/1/54
HW-32959	Radiation Monitoring Sub-Section	P.C. Jerman	9/3/54
--	Maintenance Sub-Section	E.E. Weyerts	9/3/54
HW-32649	Power Sub-Section	J.C. McLaughlin	9/3/54

Other routine reports issued during September included:

HW-33150	"Monthly Progress Report, Reactor Section Expansion, September, 1954"	H.T. Wells	9/23/54
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	F.A.R. Stainken	9/20/54
HW-32935	"Reactivity Balance and Associated Data - Period July and August 1954"	A.P. Vinther	9/1/54

2. Non-Routine

HW-33120	"Reactivity Effect of Discharging Uranium Metal"	A.P. Vinther R.D. Dunn	9/21/54
HW-32913	"Process Test, MR-105-24, High Rate Water Treatment Test At Post CG-558"	W.R. Conley	9/7/54
HW-32754	"Front Crossheader Check Valve - B, D, DR, F and H Reactors"	A.K. Hardin R.D. Schilling	

DEL

F. Significant Reports (Continued)

Confidential - "Discharge of Mint Slugs From  
 Undocumented Poison Column Control Tube  
 At DR Reactor"

O. C. Schroeder 9/23/54

DECLASSIFIED

III. PERSONNEL

A. Organization

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

Utilizing craftsmen from the individual areas, a paint crew with a foreman was organized in the Unusual Maintenance Unit of the Maintenance Sub-Section. The function of this group will be to handle major painting programs in the 100 Areas.

B. Force Summary

	<u>Beginning of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	3	+ 1
Operations	331	333	+ 2
Maintenance	526	543	+ 17
Projects & Personnel Development	34	38	+ 4
Power	455	452	- 3
Process	58	55	- 3
Radiation Monitoring	76	78	+ 2
Section Total	1482	1502	+ 20

Changes during September included 26 transfers into the Section, 14 transfers out of the Section, 15 new hires, five terminations, two reactivations and four deactivations.

C. Safety Experience

One Major Injury, No. 106, occurred in the Reactor Section on September 27, in Building 184-F when a Power Operator tripped over the drain line from a forced draught fan and fell to the floor breaking his lower right arm near the elbow. There were no Sub-Major injuries in the Reactor Section during September.

A revision of reactor charge and discharge elevator electrical circuits is being prepared which will provide a continuous ringing of the elevator alarm bell for a period of approximately five seconds prior to elevator movement. This revision is being made as the result of a recent Near-Serious Accident in which an electrician's arm was caught between a discharge elevator railing and a light fixture cover when the elevator was moved without warning to the injured.

D. Radiation Experience

There were no Class II or Class I Radiation Incidents in the Reactor Section during September.

E. Personnel Activities

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

Staffing of KW Reactor facilities continued during September. Operations Sub-Section supervision and chief operators have been assigned, with the remainder of the operators scheduled to report early in October. A full complement of Power Sub-Section personnel to operate the KW Water Plant has reported to K Area, with the necessary manpower to staff KE Water Plant backup facilities for KW Reactor scheduled for transfer in October. To date, Operations Sub-Section training at KW Reactor has been directed toward seminar type discussions relating to physics, start-up tests and engineering considerations, and conducted by appropriate specialists. A formal training program is scheduled to begin early in October when the main group of operators arrives. Power Sub-Section personnel are becoming familiar with water plant equipment during test operation. Approximately 70 per cent of the Maintenance Sub-Section craftsmen for KW Area were at the area at month end. The Radiation Monitoring Sub-Section personnel to staff KW Reactor have been added, but have not yet reported to K Area.

R. S. Hammond of the Process Sub-Section attended the First International Instrument Congress and Exposition in Philadelphia, Penn., during September 13 to 22. In addition, he visited Panellit Inc. at their new Chicago plant on September 23 to discuss current Panellit gage maintenance problems.

E. W. Baker of the Process Sub-Section visited the Puget Sound Naval Shipyard at Bremerton, Washington on September 28, to determine whether or not machine tool equipment and suitable materials were available for fabrication of replacement gears for Building 190-H process pump unit speed reducers as described in detail under "Equipment Experience."

J. T. Beavers of the Process Sub-Section attended a meeting on power transistors conducted by Minneapolis-Honeywell in Richland on September 15.

At a meeting of approximately 60 members of the Process Sub-Section and other sub-section superintendents, W. K. MacCready discussed the results of his special studies during the past year relative to power reactors and the amended Atomic Energy Act.

Eleven meetings conducted by Education and Training Section Representatives were held during September to discuss non-exempt employee ratings with Reactor Section supervision. Approximately 105 people attended.

1215250

**DECLASSIFIED**

Richland, Washington  
October 6, 1954

MANUFACTURING DEPARTMENT  
SEPARATIONS SECTION  
SEPTEMBER, 1954

**I RESPONSIBILITY**

Responsibilities of the Separations Section were unchanged during the month of September.

**II ACHIEVEMENT**

**A. Operating Experience**

**1. Statistics**

**a. Bismuth Phosphate Operations**

	<u>September</u>		<u>August</u>	
	<u>Normal</u>	<u>Acid Wash</u>	<u>Normal</u>	<u>Acid Wash</u>
Charges started in Canyon Bldgs.	74	0	58	2
Charges completed in Conc. Bldgs.	75	1	51	4
Special charges - Conc. Bldgs.		4		6
Charges completed-Isolation Bldg.	328		266	
Average Waste Losses, %		2.39		2.69
Special charges - Isolation Bldg.	31		55	
Material balance, %	99.85		101.81	
Yield through Process, %	97.46		99.1	
Average cooling time (days)	91		96	
Minimum cooling time (days)	60		70	

# DECLASSIFIED WITH DELETIONS

b. Redox Operations

	<u>September</u>	<u>August</u>
Equivalent charges started	241.8	182.2
Charges completed	244.4	188.9
Tons Uranium delivered to storage	154.1	111.8
Average Production Rate per operating day, Tons	6.2	5.7
Average Daily Operating Rate for the month, Tons	5.1	3.6
Average yield, %		
Uranium	96.4	97.6
Plutonium	100.5	100.9
Total Waste Loss, %		
Uranium	1.71	1.58
Plutonium	0.60	0.99
Average cooling time, days	102	109
Minimum cooling time, days	90	82
Percent down time	18	37.0

c. 234-5 Operations

	<u>September</u>	<u>August</u>
Batches completed through Task II	130	128
Runs completed through Task III	125	117
Reduction yield, RM	97.0	98.5
Waste Disposal, units	2.27	4.34

d. UO<sub>2</sub> Operations

	<u>September</u>	<u>August</u>	<u>To Date</u>
Uranium drummed, Tons	307.11	318.87	7413.28
Uranium shipped, Tons	332.75	323.31	7396.22
Average cooling time, days (Redox)	126	112	
Minimum cooling time, days (Redox)	106	107	
Waste loss, %	0.05	0.03	

e. TBP Operations

	<u>September</u>	<u>August</u>	<u>To Date</u>
Tons received from Metal Removal	158.22	249.93	4568.30
Tons shipped to UO <sub>2</sub> Plant	165.51	252.67	4421.42
Average Production Rate per operating day, Tons	6.53	8.43	
Average Daily Operating Rate for the month, Tons	5.51	8.15	
Average yield, %	98.82	100.57	

DECLASSIFIED

e. TBP Operations (Continued)

	<u>September</u>	<u>August</u>
Total Waste Loss, %	0.75	0.65
Ratio Waste Volume returned to Volume removed	1.39	1.12
Percent Down Time	15.45	3.31

f. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped, gpm	1 348	8 182
Filtered water pumped, gpm	422	1 050
Steam generated, lbs/hr	35 700	152 884
Maximum steam generated, lbs/hr	69 959	242 000
Total steam generated, M lbs.	25 704	110 076
Coal consumed, tons (est.)	1 622	7 308

h. Waste Storage

	<u>Equivalent Tons U</u>	
	<u>Sept.</u>	<u>August</u>
Metal Waste reserve storage capacity-T Plant	658	756
1st Cycle reserve storage capacity-T Plant	611	739
Metal Waste reserve storage capacity-B Plant	1 001	1 001
1st Cycle reserve storage capacity-B Plant	79	406
Redox Waste reserve storage capacity	1 304	1 412

2. Activities

a. Redox Processing

A production rate of approximately 7 tons/day was maintained in the Redox Plant during the first part of the month, however it was necessary to reduce the rate to 6 tons/day after the loss of the D-13 (waste receiver) agitator, weight factor and A jet on September 7, 1954, when a vapor phase reaction took place in the tank. A 48 hour shutdown (9-12-54 - 9-14-54) was taken to inspect the waste receiver tank and effect repairs, however no corrective action was taken as the top of the tank was so distorted that it was impossible to effect repairs short of replacement of the vessel. With the defective D-13 (waste receiver) equipment, a 6 ton/day rate was accepted as the maximum permissible safe operating rate until a new tank can be installed. The Engineering Department has been asked to study the problem. In the meantime, in order to minimize the potential hazard, the vacuum of the inert gas blanketed tanks has been reduced to lessen the amount of air leakage into these tanks and a positive inert gas purge of the D-13 (waste

a. Redox Processing (Continued)

receiver) tank is being made through the chemical addition line. Two other shutdowns, 17 hours on 9-18-54 and 26 hours on 9-22 - 9-23-54, were necessary to replace a faulty G-5 to H-2 jet (transfer to head-end centrifuge) and to rework a head-end batch.

Difficulty in decontaminating the uranium stream sufficiently to meet specifications continued during most of the month, however a marked improvement was noted during the last week when in specification uranium was produced. Minor process changes, better control and continuous steady state operations apparently effected the change, but present data is still insufficient to permit an accurate analysis of the problem.

b. TBP Processing

Both "A" and "B" lines operated continuously during the month except for five days downtime for minor maintenance and line flushes. Waste losses and decontamination performances were highly satisfactory. With a process rate above 6.5 tons/day through the TBP Plant, it becomes necessary to reduce the A Line RC stripping column pulse frequency from a normal 85 to 75. This necessitated an increase in the RC stripping column extraction flow (RCX) to overcome a tendency toward higher waste losses. Since this limitation may carry over to two cycle operation, test rates above the 6.5 tons/day are planned to fix certain operating variables.

c. UO<sub>2</sub> Processing

Production rates were lower during the period because only uranium from the TBP Plant was available for processing. Redox uranium was reprocessed at the TBP Plant. The UO<sub>2</sub> Plant received the first batch of Redox uranium on 9-28-54.

Some foaming was experienced in the furnaces but was effectively controlled by the addition of small amounts of a silicone de-foaming agent.

d. Waste Metal Removal

Tank farm production averaged 5.4 T/D uranium which was lower than previous months due to the depletion of aged stored wastes but sufficiently high to provide committed needs. Sluicing of minimum 2.2 year sludge from the 107-TX Tank was discontinued on Sept. 13 due to the inability of the TBP Plant to successfully decontaminate the RAF feed containing 3-4% of the 107-TX sludge. A second trial using a higher acid flow sheet condition will be made in an effort to successfully process a blend of the 107-TX material.

Waste scavenging activities began on September 29 with the flush of the waste system through WR-001 pump-out tank. However, the

DECLASSIFIED

d. Waste Metal Removal (Continued)

program has been delayed as the result of failure of a recently installed 80 gpm multi-stage turbine pump, two of which are required to handle the unconcentrated scavenged waste delivered to underground storage. The cause of failure, rotation of the pump in reverse, is being investigated.

e. Isolation and Metal Fabrication Processing

Although production was limited in the Isolation operation due to the quantity of feed material available, commitments were met. Some difficulty was experienced in meeting off-site specifications for shipment, and 24 below specification sample cans were reprocessed as oxalate material. The low purity material was apparently attributed to P-2 (precipitator) tank filter stick corrosion and residue formation in the distillation system. The filter stick was replaced and a cleanout of the distillation system was made.

Operations were essentially normal in the Metal Fabrication Plant although difficulties were experienced with failures of the heating elements in the casting furnaces. One Model 110 Assembly was produced from controlled 200 MWD material to permit complete evaluation of isotopic quality and provide a better basis for specifications covering the shipment of 200 MWD nitrate off site. Of particular concern here was the neutron count and its relation to the average exposure during formation in the piles.

f. T Plant Processing

Operations in T Plant were essentially normal. A 12% increase in the production capacity of the extraction cycle was obtained without affecting the quality of product by increasing chemical addition rates and reducing digestion periods. The occurrence of high waste solutions encountered in the first and second decontamination cycle by-product sections was reduced by adjusting the acid concentration flow sheets to optimum conditions.

3. Special Operations

a. Waste Evaporators

September operating data for the 242-B and 242-T waste evaporators are as follows:

<u>Evaporator</u>	<u>Gallons Feed</u>	<u>Gallons Bottoms</u>	<u>Gallons Concentrate</u>	<u>% Volume Reduction</u>
242-B	429 000	251 624	177 376	41.3
242-T	283 187	200 370	82 817	29.2

b. Pu Recovery, 234-5

Recovery operations were curtailed during the month to allow processing in Redox Plant only standard Isolation process supernates during a period of study of the affect of recycle material on the Redox process.

c. UO<sub>3</sub> Powder Recovery

All filter bags in the bulk solids handling system were replaced. The approximately 594 pounds of Uranium recovered from the filter bags by vacuum cleaning were blended in the product stream.

4. Schedule Variance

Production commitment in Redox Plant was slightly less than forecast due primarily to the forced reduction of the operating rate to 6 T/D on September 17 following the incident of the vapor phase reaction in the D-13 (waste receiver) tank. All other commitments were met or exceeded their forecast.

Redox Plant production of separated plutonium was 97% of forecast while T Plant achievement was 112% of forecast. Total plutonium separated was 99% of forecast.

The Metal Fabrication quarterly commitment for Model 110 and 130 shapes and buttons was 105%, 100% and 100% respectively.

Uranium recovery production exceeded forecast as the TBP Plant attained 158% and the UO<sub>3</sub> Plant 110% of forecast. A total of 10 carloads of UO<sub>3</sub> powder was shipped in September.

B. Equipment Experience

1. Operating Continuity

Redox downtime totaled 91 hours for inspection of the D-13 (waste receiver) tank, replacement of the G-5 to H-2 jet (transfer to head-end centrifuge) and to rework a head-end batch.

TBP Plant downtime totaled 118 and 114 hours respectively for "A" and "B" lines for minor mechanical difficulties and line flushes.

Scheduled overhaul and replacement work resulted in Isolation operations being down 10% of the time, however this did not affect overall production through the building. Temporary delays were experienced in the casting operation in Metal Fabrication however by optimum use of available operating time no adverse effect on overall operating continuity resulted.

In T Plant, 60 hours production time was lost due to reworking high extraction waste batches, plugging of the metal waste cascade line

DECLASSIFIED

1. Operating Continuity (Continued)

between 107-U and 108-U tanks and scheduled steam shutdown to effect repairs to the header.

2. Inspection, Maintenance and Replacementa. D-13 (Waste Receiver) Tank - Redox

On September 13, 1954, "D" Cell was opened for the purpose of remotely inspecting the D-13 tank and related equipment to determine possible damage caused by the vapor phase reaction on September 7, 1954. The D-13 agitator was removed and the shaft was observed to be bent at about a 35° angle and three of the paddles were bent back sharply around the hub. The weight factor and Sp. G. dip leg had broken off at the tank connector nozzle and had fallen to the bottom of the tank. The D-13 to D-12 A jet's dip leg was bent almost parallel with the top of the tank and was removed remotely with difficulty. Efforts to remove the broken off dipleg from the bottom of the D-13 tank were unsuccessful. Prior to the shutdown, a type 106 agitator had been revised to fit the D-13 tank since there were no available spares on hand for this service. A new weight factor and A jet had also been previously fabricated for installation during this shut down. When attempts were made to install the new weight factor and A jet jumpers in the D-13 tank, it was readily apparent that the top of the tank had become distorted to the point that these jumpers could not be fitted. Further attempts at repairs to this equipment were postponed pending preparation of a new D-13 tank and associated jumpers. Present plans call for replacement of this tank early in October.

b. WR-001-2 Pump - Waste Metal Removal

On startup of the special pump installed for waste scavenging pump-off, the pump reversed, unscrewing stage shafting and jamming the pump. The cause was attributed to reverse wiring and an investigation is underway. The pump will have to be replaced.

c. Casting Furnaces, Task IV, Metal Fabrication

Defective heating elements and air leaks into the casting furnaces, Task IV, Metal Fabrication required considerable maintenance to maintain sufficient casting units in operation to obtain the production for the month. At month end, necessary repairs had been completed and normal operations resumed.

d. Reactor 4-5L - T Plant

Since numerous difficulties and plugging had occurred with the operation of the 4-5L dissolver silver nitrate reactor, a

d. Reactor 4-5L - T Plant (Continued)

replacement unit was installed on September 25. Operation of this third, recently activated, dissolver has been satisfactory.

C. Improvement Experience

1. Process Tests and Revisions

a. UO<sub>3</sub> Reactivity Improvement with Sulfamic Acid Additive

During the month routine addition of sulfamic acid to all calcination was started. It was agreed with the vendees to continue using 0.05 weight percent addition of sulfamic acid for K25 shipments and to evaluate lower percentages for shipments to Paducah starting with .03 percent. The average value for UO<sub>3</sub> conversion to UF<sub>4</sub> on the first three carloads of product containing 0.05 weight % sulfamic acid was 82.5% as compared to 69.5% for powder with no additive.

Product caking as a function of agitator speed was further evaluated with tests being conducted at 20, 25 and 30 RPM, and 0.08 weight % sulfamic acid addition. Results show that product caking due to using sulfamic acid is markedly reduced at the lower agitator speeds. However, there is a hard ring type build-up of oxide between the agitator and the pot wall which must be removed before it eventually freezes the agitator. A second adverse effect is the reduced heat transfer and slightly longer time cycles. The optimum balance between agitator speed and sulfamic addition will be established by these tests.

b. Evaluation Test of CO<sub>2</sub> to Replace Helium

On September 9 on a test basis, CO<sub>2</sub> was introduced to the RMA Line in place of He in the two machining hoods, the two recovery hoods and the pressing hood. Approximately 50% of this month's production was produced using CO<sub>2</sub>. There was no indication of plutonium corrosion in the machining operation and the hood atmosphere was reduced below 10% oxygen content in less time than was required with helium. In the briquetting and metal recovery hoods no detrimental effects from the use of CO<sub>2</sub> were observed.

c. Beta Scintillation Counter - Analytical

The experimental work to determine the feasibility of replacing the present GM type instruments for beta counting with Scintillation Counters was substantially completed. The use of a thin plastic scintillation crystal with a high resolution photomultiplier tube permits high efficiency beta determination with good discriminations against gamma radiation. Although a high voltage "plateau" cannot be obtained, the instrument by proper adjustment can be made stable with respect to minor variations in the high

**DECLASSIFIED**c. Beta Scintillation Counter - Analytical (Continued)

voltage supply and discriminator settings. Extended stability tests have indicated the crystal housing will require redesign to prevent the weight of the phototube from distorting the plastic crystals. This work will find many applications at Purex start-up as well as in the determination of fission products being routed to the ground.

2. Inventions or Discoveries

Evaluation of a suggestion submitted through the Suggestion System by a welder, who has since terminated, reveals the possibility that the type of cutting torch he proposed may possibly be patentable.

An invention report was filed by Reed Overson and B. W. Marsh on a portable bulk materials dispensing hopper handled by a fork lift truck.

D. Events Influencing Costs

The increased, over August, production from Redox and the  $BiPO_4$  facilities coupled with the necessity of reworking approximately eighty-six tons of Redox uranium at the TBP facility will result in an increase in the total Separations Section expenditures for September. The increased cost will be due primarily to the additional essential materials requirements associated with the higher production.

During the month the machining and briquetting operations in Metal Fabrication were conducted successfully for several days using carbon dioxide as the inert gas blanket in place of helium which has been used in the past. Significant savings will result from the elimination of helium in these operations.

E. Plant Development and Expansion1. Project Statusa. Project CA-513-A, Purex

Construction as of September 15, 1954 is 67 percent complete compared with a scheduled 80.8 percent. Overall project completion advanced 5.5 percent during the last monthly period. The "Ready for Operation" date continues to be August 1, 1955.

One of the more serious construction problems at present concerns concentrator fabrication. Inspection of the four units which have been received revealed very poor welds and crevices in one section of the units which would lead to

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

high corrosion and consequent failure. These units are undergoing repair on site; however, to date little success has been achieved in correcting the situation.

The revision request for the Purex Ammonia Scrubber installation was approved by G.E. and the A.E.C.

A Work Authority has been issued for Project CG-598, Addition of a Vacuum Acid Fractionator to Purex. Total funds authorized are \$590,000 and completion is scheduled for December 1, 1955.

Percolation rate tests have been completed on two Purex cribs, 216-A-1 and 216-A-7. Results show equilibrium percolation rates of 21.2 and 27 gal/day/sq. ft. respectively. In general, Purex cribs were designed on the basis of percolation rates seven to ten times these figures. One more test is to be run on a "linear" crib, i.e., a covered trench. When all results are available, a review of all Purex crib sizes will be made on the basis of this information.

b. Project CG-551, 234-5 Expansion

Fabrication and mock-up of Task III equipment in the 272-W Shops is progressing satisfactorily. Testing of this equipment is to be started during the first week in October. Preliminary site preparation in the 234-5 Building may be accomplished during November if Redox production schedules permit.

The final inspection facility installation in Room 192, 234-5 Building, has been delayed by procurement problems. Resumption on construction work is anticipated for the first week in October.

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

- 1) Waste Concentrator System: Bollup tests on the D-12 waste concentrator were run at the 277-W shop during the month. Three of the jumpers require modification before the pot and tower can be disassembled. Target date for completion of the remaining work on the D-12 system is October 5, 1954.
- 2) 233-S Concentration Building: Installation of major process equipment pieces is about 50% complete, but future work on process piping and equipment will depend on receipt of these pieces from vendors. Because of the slow delivery of these items, the completion date of the building will be delayed until January 1, 1955. Estimated ready-for-operation date, therefore, becomes February 1, 1955.

DECLASSIFIED

DEL

- 3) UNH and ANN Storage: The two UNH storage tanks, associated piping and instrumentation have been completed and leak tested. Expected ready-for-use date is October 8, 1954.
- 4) Silica Gel Treatment: Design of the silica gel facility is now about 70% complete and procurement of equipment has begun. In view of its urgent need, this work is being expedited.

d. Project CG-587, TBP Waste Scavenging

With the basic equipment completed, waste scavenging activities were initiated on September 29 with the flush of the waste system through the WR-001 waste pump-out tank. As noted previously, the program was curtailed by pump failure.

e. 4X Program, B Plant Reactivation

Scoping of the work for B Plant reactivation was essentially completed during the month and should be ready for issuance during early October. Purchase requisitions, totaling approximately \$230,000, have been prepared and issued covering critical items. During September, revision of the original directive was requested so that plant forces could be assigned some preliminary checking to aid in bracketing the equipment procurement problem. This work was begun during the last week of September.

Work continued on the T Plant third extraction cycle. This work progressed rather slowly but gained momentum during the latter part of the month.

First cycle waste scavenging at both B and T Plants is definitely in the plans for obtaining waste storage space. The T Plant portion is in the study and scoping stage; this work should be completed during early October.

2. Manufacturing Engineering

a. Standards

Revised essential materials standards for 202-S, 221 and 224-T, TBP and 231 were developed from chemical flow sheets supplied by the Process Engineering Units. The Cost Standards Manual for Separations Section, HW-27193, was completely revised and reissued. The work of re-engineering the labor standards in all plants is continuing.

b. Work Simplification and Cost Reduction

The second series of the Work Simplification Round Tables program began as scheduled this month for three groups totaling 31 conferees. Six conferences were held this month totaling 116 man-hours of instruction.

b. Work Simplification and Cost Reduction (Continued)

A Work Simplification Proposal was issued entitled, "Study of Accountability Work Load - Redox Plant," in which a recommendation was made to omit present duplication of clerical work between Operations and SF personnel. SF Accountability Section personnel, in the proposed method, would submit data to the Redox Sub-Section for reporting purposes. The adoption of the proposal may allow two clerks to be reassigned elsewhere for a savings of \$9,400 per year. A survey will be made of the utilization and availability of clerical help in Redox before making a final decision.

c. Engineering Assistance

The study of the Bismuth Phosphate pre-reduction time cycle in relation to anticipated production demands for B Plant was completed. The report being prepared will include recommendations for (1) interchanging the metal solution storage tank in Section 6 and the spare metal waste neutralizer tank to gain 1100 gallons operating volume in the Section 6 pre-reduction step, and, (2) installing a holding tank (approx. 3380 gallons) in the Section 6 centrifuge position to accommodate frequently occurring metal solution heels in the prime storage tank which would otherwise extend the operating cycle.

The laundry building air system was re-balanced to provide improved operating conditions for this facility. The 277 mock-up shop ventilation system was surveyed to provide data for modifications to give more satisfactory cold weather operation. The north pipe gallery (Redox) was re-balanced after exhaust fan EF #8 was relocated. Work was started on a complete re-survey of the entire ventilation system of the Redox building.

Three bids were received to furnish equipment for television on the Redox cranes. These bids were carefully reviewed and recommendations were submitted to Purchasing to justify procurement of equipment to satisfy job requirements.

d. Property Management

Procedures and plans are being formulated for establishment of a routine system for maintenance of Landlord properties. It is proposed to establish schedules with standard times and costs. This would greatly facilitate maintenance-manpower planning, and, it is hoped, materially reduce maintenance costs of landlord properties while actually improving their condition.

The Property Management Group has approved the burning of the 200 Area guard towers, excluding search lights. Work orders have been issued to remove the lights and burn the structure. The disposal by burning was recommended by the Radiological Sciences Department because of radioactive contamination on and around the towers.

DECLASSIFIED

d. Property Management (Continued)

The extensive program to improve housekeeping of the 200 Areas was continued during September with the result that the major portion of the cleanup is completed. However, the efforts will be continued to improve the appearance of the 200 Areas.

F. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>
HW-33265	Separations Section Redox Plant Sub-Section Monthly Report - September 1954	R.T. Jessen
HW-33279	Separations Section Metal Recovery Plant Sub-Section Monthly Report - September 1954	V.R. Chapman
HW-33333	Separations Section T Plant Sub-Section Monthly Report - September 1954	C.T. Groswith
HW-33312	Separations Section B Plant Sub-Section Monthly Report - September 1954	T. Prudich
HW-33332	Separations Section Z Plant Sub-Section Monthly Report - September 1954	W.N. Mobley
HW-33277	Separations Section Analytical Sub-Section Monthly Report - September 1954	L.M. Knights
HW-33246	Separations Section Radiation Monitoring Sub-Section Monthly Report - September 1954	A.R. Keene
Confidential Undoc.	Separations Section Projects & Personnel Development Sub-Section Monthly Report - September 1954	O.V. Smiset
Official Use Only	Separations Section Power & Maintenance Sub-Section Monthly Report - September 1954	C.P. Cabell
HW-33292	Separations Section - Essential Materials	G.E. Cooper
HW-32775	Essential Material Area Report to Cost and Purchasing	G.E. Cooper
HW-32928	Essential Material Consumption for Redox Plant	G.E. Cooper
HW-32927	Essential Material Consumption for TBP Plant	G.E. Cooper
HW-32926	Essential Material Consumption for T Plant	G.E. Cooper
HW-33002	Separations Section Waste Status Summary	D.E. Peterson
HW-33201	Monthly Progress Report - Plant Expansion Projects & Personnel Development Sub-Section Separations Section - September 1954	F.A. Hollenbac

2. Non-Routine

HW-32967-RD	Essential Materials Standard for T Plant - ME Report No. 5	R.E. Silletto
HW-32967-RD	Essential Materials Standard for Metal Recovery Plant	G.R. Ruzicka & R.E. Silletto

2. Non-Routine (Continued)

<u>Number</u>	<u>Title</u>	<u>Author</u>
HW-33165-RD	Redox Essential Materials Standard, ME Report No. 6	V.P. Madsen
HW-33244-RD	Essential Materials Standard for 231 Bldg., ME Report No. 7	R.S. Himmelright
None	Revision to Equipment, RMA Briquetting Hood, Work Simplification Proposal No. 6	R.S. Himmelright
None	Study of Accountability Work Load, Redox Plant Work Simplification Proposal No. 7	V.P. Madsen
None	Purex Facility Crane Requirements, Letter form to W. M. Harty, dated Sept. 2, 1954	F.A. Hollenbach
HW-33125	Plutonium Metal Turnings Fire	W.N. Mobley
HW-32908	BPK Process with Thorex Adaptability	C.R. Anderson
HW-33160	Proposed Phase Separator for Extraction Process	L.W. Finch
HW-33001	Redox Process Discussion Meeting	O.F. Beaulieu
None	Report of Vapor Phase Reaction in D-13 Vessel	R.T. Jessen by O.F. Beaulieu
HW-33190	Radiation Incident, Class I, No. 383	R.E. Slater
HW-33191	Radiation Incident, Class I, No. 385	R.E. Slater

III PERSONNELA. Organization

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

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	2	0
Redox Plant Sub-Section	222	230	+8
Metal Recovery Plant Sub-Section	301	295	-6
Z Plant Sub-Section	181	185	+4
T Plant Sub-Section	194	198	+4
B Plant Sub-Section	5	6	+1
Power & Maintenance Sub-Section	328	320	-8
Projects & Personnel Development	65	71	+6
Analytical Sub-Section	165	164	-1
Radiation Monitoring Sub-Section	77	79	+2
Section Total	1540	1550	+10

C. Safety Experience

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

**DECLASSIFIED**D. Radiation Experience

Two Class I radiation incidents occurred, involving; (1) potential excessive exposure to railroad crewmen, when several metal pieces were dropped from a bucket into a cask car well during charging operations (No. 383 - HW-33190); and (2) two operators who worked without proper monitoring near canyon deck contamination of 40 rads/hr (No. 385 - HW-33191).

Initial efforts to remove stack-emitted radioactive particulates from occupied locations in the 200 West Area were not successful as blow-in from surrounding contaminated areas occurred. The entire program was reviewed and modified to include more intensive monitoring of employees who work outside and expedite plowing of highly contaminated ground areas east of the Redox Plant.

E. Personnel Activities1. Personnel Programs and Training

G.E. Selection Program evaluation is underway for eight Operations Unit personnel. Fifty-eight weekly personnel attended training programs which included Process and Equipment, Radiation Monitoring, Instrument, Safety and Security Orientation. In addition, 28 supervisors attended the first meeting of the Supervisor's Safety Training program and 50 supervisors attended six programs covering non-exempt ratings. Forty-nine supervisors attended the first meeting of a series of Information Meetings for first line supervisors conducted by the Section Manager.

2. Visitations

No visitations were made by Separations Section personnel during the month.

ENGINEERING DEPARTMENTSEPTEMBER 1954TECHNICAL SECTION

Gross porosity in the braze layers of lead dip canned fuel elements has severely limited slug production in recent weeks. As many as 75 percent of the slugs in some lots have been rejected for porosity, which is associated with the use of slug cores heat treated in a new submerged electrode furnace at Fernald. More moderate amounts of porosity found with uranium heated in slug form at HAPO (particularly Mallinckrodt metal) have also significantly reduced canning yields. The porosity apparently results from the outgassing of hydrogen from the slug core during the canning operation and becomes increasingly severe when the hydrogen content of the uranium exceeds about 2 ppm. The recent process changes coincident with the use of the new Fernald heat treating facilities and the recent process conditions during ingot manufacture at Mallinckrodt are being reviewed to determine what factors have lead to increased susceptibility to hydrogen pickup and increased hydrogen contents.

The successful extrusion of thirty-two unalloyed uranium billets was carried out by Bridgeport Brass at Adrian on August 31 and September 1. Examination of the extruded material showed the hole to be round and concentric within desired tolerance. From this extrusion trial the conditions necessary for production of hollow uranium rods with a 1/4 inch hole have been developed.

There was only one slug rupture of normal uranium during the month. There were two ruptures of thorium flattening pieces, one a cap failure and the other a longitudinal split occurring at an exposure of 1250 MWD/AT.

The production test at C Pile of two tubes of cored uranium slugs and two tubes of control slugs have been irradiated at high powers for about two months. No failures have been encountered.

Two hundred and thirty-six hot-press canned, nickel plated, solid uranium fuel elements were charged in C Pile on September 3. One is scheduled for discharge at 300 MWD/T about November 1. Approximately 120 hot-press canned, nickel plated, externally cooled only, cored uranium elements were shipped to C Pile for charging during the month end shutdown. Canning of hot-pressed, nickel plated, internally and externally cooled elements has commenced. About 225 pieces will be canned for irradiation at C Pile.

About 150 tubes of J-Q columns have been charged in H Pile and 150 in C Pile as a part of the program to supply Oak Ridge with irradiated material for pilot plant use.

The Redox plant performance improved through the month with respect to uranium decontamination and waste loss reduction. Plutonium quality remained excellent. Several changes were made to the second and third uranium cycle portions of the flowsheet with the objective of repressing emulsion and entrain-



DECLASSIFIED

ment problems which appear to be the cause of the inadequate decontamination of uranium. Some relief was obtained by these actions; however, the greatest improvement in performance was associated with the first cycle operation. This improvement is accounted for by restricting the types of recycle material introduced into the plant to those least likely to contain emulsifying agents.

A vapor phase reaction occurred in the salt waste receiver in the Redox Plant which resulted in a pressure surge in the tank and associated piping system. The source of ignition is not clearly established but is associated with the tank agitator which was deformed as were other tank intervals. Inspection of the failed agitator may permit more definite conclusions. The inert gas blanket was not adequate to reduce the oxygen-hexone ratio below the lower explosive limit and equipment changes were made to increase the effectiveness of inert gas blanketing.

Scavenging of the Waste Metal Recovery Plant aqueous waste stream with nickel ferrocyanide was inaugurated during the latter part of the month.

Continued correlation of MWD/T and N/g/s data has indicated that the MWD/T value can be raised to 205 on a weighted basis with satisfactory adherence to the 20 N/g/s limitation.

Three Bismuth Phosphate Plant precipitator vessels (T-D-1, B-D-1, B-E-1) have been opened for examination. In all three vessels the weld metal has been preferentially attacked with respect to wrought material. It would appear advisable to reweld the D-1 and E-1 vessels and to inspect all B Plant startup.

Some properties of a lattice of 0.9 inch diameter, cored, enriched uranium (0.8% U-235) slugs on a 4.5 inch spacing were determined by extrapolation of exponential pile data and by calculations based on the most recent nuclear constant data. Under cold, clean conditions loss of water is calculated to cause a reactivity loss of about 1000 inhours. At operating temperatures this loss of reactivity would be increased, calculations, which are subject to considerable uncertainty, indicating total temperature coefficients of  $-5.4 \times 10^{-5}/^{\circ}\text{C}$  and  $-12.3 \times 10^{-5}/^{\circ}\text{C}$  for the wet and dry cases, respectively. These data are for zero exposure metal only. The effect of exposure on temperature coefficients has not been calculated for this particular lattice but calculations for a wet H-type lattice, which may be roughly applicable, indicate a substantial effect. For example, a gain of ca. 1.5 in-hours per MWD/T of exposure at 27 C increases to about 4.6 in-hours per MWD/T at 427 C.

For the first time it appears possible to analyze plutonium in a separations process feed solution by a direct chemical (coulometric) method. This opens up the possibility of a complete chemical material balance across a separations plant with elimination of discrepancies resulting from the use of a combined radioassay--chemical assay system.



DESIGN SECTION

Distribution of Design Section effort for the month was as follows: 30% to Design Development; 19% to the 1952 Hanford Expansion Program; 20% to Reactor Plant Modification for Increased Production; 4% to the 4-X Program, and 27% to other projects and design orders. Design Development activity was down slightly from the rate for the previous month with a corresponding increase in 4-X Program effort.

Total design for Project CG-558, Reactor Plant Modification for Increased Production advanced to 38.5%. Scope design is 85% complete and detail design was advanced 8.3% during the month to 33.1% complete. Work is continuing on preparation of Project Proposal, Revision 4. This proposal incorporates 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 and the construction estimate \$25,400,000.

Activity on the Hanford 4-X Program continued to gain momentum. Scope design for the reactivation of B Plant was completed and preparation of a project proposal for CG-603 to include B Plant reactivation, T Plant Third Extraction Cycle, and 231 Modification is in progress. Preliminary studies are continuing on the 300 Area and Metal Conversion Facilities. These studies are investigating capacity requirements and alternate methods of obtaining required increases.

Detail design for 1706-KE Recirculation Facilities was advanced 12% to 40% complete.

Design scope was completed and a revision request approved to install ammonia scrubbers in the Purex dissolver off-gas system. Scope design was completed for Redox nitric acid recovery and ammonia removal facilities.

Reactor design development studies for an intermediate power level dual-purpose reactor continued during the month and an interim feasibility report was issued. Other studies includes investigation of the potential reactor power level increase resulting from operation at higher process tube outlet pressures and temperatures. A report was issued on the effect of the loss of steam to the process pumps at 100-B, C, F, DR and H.

Separation design development activity included the completion of the TEX study with issuance of a feasibility report which indicates that the proposed facilities are not economically feasible on a short term basis. A BPX study is being prepared which provides for the shutdown of TBP and T Plants by converting B Plant to a solvent extraction facility. The Purex capacity study was substantially completed and the results indicate that equipment such as jets, rotameters, and control valves are the only bottlenecks below an instantaneous plant capacity factor of 2.0.

**DECLASSIFIED**PROJECT SECTION

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

<u>Project No.</u>	<u>Title</u>	<u>Completion</u>	
		<u>Scheduled</u>	<u>Actual</u>
CG-496	Recuplex	81%	75%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	98.7
	Reactor and Building	100	99.3
	KE - Water Plant	100	91.3
	Reactor and Building	94	87
	General Facilities	97	91.3
CA-513	Purex Facilities, Part "A"	85	73
	Part "D"	88	97
CA-514	300 Area Expansion	60	64
CG-535	Redox Capacity Increase, Phase II	80	76
CA-546	Fuel Element Pilot Plant	51	30

Blaw-Knox carpenters, who had been on strike since August 13, 1954, returned to work at the Purex site on September 2, 1954. Millwrights have continued to protest the assignment of machinists to current work in 2101-M Building; however, this has not reached serious proportions.

The warehouse service for Minor Construction Miscellaneous Stores now includes about 60% of the store stock material formerly stored and controlled by Kaiser Engineers. Three major items, electrical equipment, protective clothing, and small tools, are yet to be received.

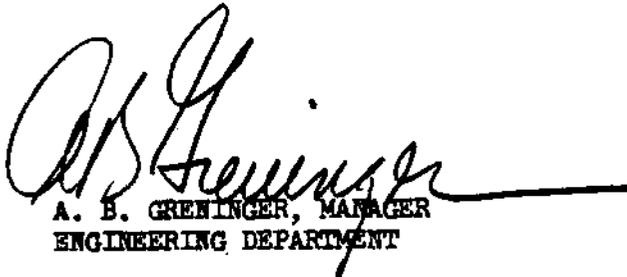
At 2101-M Building, production was begun on graphite to be machined for the Physical Constants Test Reactor, and completion was estimated at about October 31, 1954. Acceptance testing of 105-KW Reactor and Building progressed to 34% complete. Preparations were completed for parts of the dynamic flow test concerned with raw water back-up, and acceptance testing for service water back-up was begun. The process water system for 105-KW has been tested under low pressure in final preparation for the dynamic flow test. For 105-KW Reactor final repairs and adjustments are being made on both rod systems. The Ball Third Safety System is being given final adjustments and tests, as are all electrical and instrument systems. At 105-KE Building the front face hydrostatic test and acceptance testing of air systems began late in the month. The 24" cross-tie line has passed a flow test of 40,000 gpm. Delivery of a new secondary pump bowl casting has been promised for early October 1954. Two more complete castings and two halves have been shipped from Oakland, California, to Portland, Oregon, for finishing. The 100-K railroad was completed during early September, and subcontracts were completed by the Steel Construction Company and Midwest Piping, Inc.

Work on CA-539, Additional Waste Storage Facilities for Redox, was completed, and the facility was accepted September 8, 1954. Construction of the 202-A Building was reported by the contractor as 71% complete. Miscellaneous small

placements of concrete were made, and concrete cover blocks were completed. Amercoat painting was completed through Cell "E," and the stainless steel liner in the Decontamination Cell was essentially completed. Installation of piping in the Hot Pipe Trench progressed to about 88% complete. Lines in all galleries are being tested and flushed. Installation of tanks in Cell "D" and in Acid Storage was completed about mid-September. Eight sections of the 291-A Stack liner were installed. Equipment placement in 202-A Building included nine vessels in the Canyon, three vessels in the Service Area, and eight agitators in the Service Section. Electrical and instrument work consisted of connecting, testing, and checking. Additions to Filter Plant and Power Plant have progressed to the stage of final testing.

ORGANIZATION & PERSONNEL

Total on Roll, September 1, 1954	1,496
Accessions	26
Separations	45
Total on Roll, September 30, 1954	1,477

  
A. B. GRENINGER, MANAGER  
ENGINEERING DEPARTMENT

**DECLASSIFIED**

HW-33200

Dec

ENGINEERING ADMINISTRATION SECTION

SEPTEMBER 1954

The first cycle of the 30-day inventory of classified documents using IBM listing was completed on September 7. Lists for personnel in the AEC were packaged and sent to the Commission, with a request for directions on future inventories of AEC personnel. The second round of the inventories was begun on September 9 and 469 lists were mailed out by month's end. The checking of the lists is proceeding more smoothly and the overtime worked on document inventories was markedly reduced.

The incorporation of the 700 Area document holdings into the 300 Area document collection was begun, and the destruction of excess copies is proceeding satisfactorily. Only one copy is being retained of all HW documents six months or older, unless they are pending reserves. Care is also being taken to retain (1) a legible copy for future reproduction and (2) a signature copy. Of approximately 237 drawers of documents in 700 Files, 14 have been consolidated to date.

During the period Technical Publications was assigned the task of surveying and keeping current a file of publicly release technical, engineering and scientific information concerning Hanford. To assist in this program, Public Relations has extended the scope of its press clipping service and all clippings are being reviewed by Technical Publications. It is planned to incorporate into the index all previously published information on Hanford, and to maintain it on a current basis thereafter.

During the month the following major contract activities were handled:

1. Modification No. 1 to Special Agreement No. G-31 between General Electric and Abadan-Spokane covering an extension of time and revision of contract price was signed by Abadan-Spokane on October 1, 1954.
2. Special Agreement No. G-48 between General Electric and the Future Farmers of America, Inc. providing for the exchange of certain sheep was executed by Future Farmers September 30, 1954.
3. After review of the security facilities available to Dr. George Watt for the protection of classified documents assigned to him, the Atomic Energy Commission Security Division has withdrawn his right to hold classified material. No objection was raised to the continued consulting work of Dr. Watt as long as it involved only work at the Plant. Modification No. 1 to Consultant Agreement No. 116 providing for an extension of time of the agreement was forwarded to the Commission for approval September 14, 1954.
4. Special Agreement No. G-49 between General Electric and the University of California at Los Angeles covering the use of University-owned seam welder was sent to the University for execution September 20, 1954.

5. Modification No. 1 to Consultant Agreement No. 122 between General Electric and Stanford Research Institute providing for an extension of time has been approved and conformed copies have been distributed.
6. Invitations to Bid on the printing of Hanford Works Official Telephone Directory were issued September 27, 1954. Bids will be received October 20, 1954.
7. On September 23, 1954, the Chief, Patent Branch of the Atomic Energy Commission forwarded the eleventh interim patent clearance certification covering Hanford Operations work under General Electric Company prime contract No. W-31-109 ENG-52 for the period May 1, 1953 through April 30, 1954.

DECLASSIFIED

**DECLASSIFIED**

FILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

SEPTEMBER 1954

1215273

VISITORS AND BUSINESS TRIPS

J. C. Ballinger visited Knolls Atomic Power Laboratory and General Engineering Laboratory, Schenectady, New York, September 21 through 25, to explore possibility of transfer.

D. H. Curtiss and L. H. McEwen attended the American Chemical Society meeting in New York City, New York, September 13 through 17.

R. V. Dulin and G. E. Wade visited Argonne National Laboratory, LaMont, Illinois, September 13; Westinghouse Atomic Power Division, Pittsburgh, Pennsylvania, September 15; and Knolls Atomic Power Laboratory, Schenectady, New York, September 16 and 17, for discussions on KAPL-120 loop design.

A. G. Dunbar attended the Instrument Society of American meeting in Philadelphia, Pennsylvania, September 20 through 26.

L. H. McEwen and W. C. A. Woods visited Oak Ridge National Laboratory, Oak Ridge, Tennessee, September 20 and 21, for technical consultations.

J. M. Davidson and J. F. Fletcher visited Phillips Petroleum Company, Idaho Falls, Idaho (Arco), September 13 through 15, for liaison regarding proposed facility.

J. E. Rector is at Asco Sintering Company, Los Angeles, California, beginning September 7, for consultations of fabrication of boron carbide rings. This visit will be completed during October.

ORGANIZATION AND PERSONNEL

	<u>August</u>	<u>September</u>
Administrative	5	5
File Development	54	62
File Engineering	75	74
Special Irradiations	24	25
Technical Liaison	6	6
Total	174	172

File Development: Two Engineering Assistants 12 terminated to return to school.

File Engineering: One Senior Engineer was hired in, two Technical Graduates - Rotational transferred in from Design-Design Engineering, three Engineering Assistants 12 terminated to return to school, one Junior Engineer was drafted into the Army, and one Technical Graduate was converted to Junior Engineer.

Special Irradiations: One Technical Graduate - Rotational transferred in from Radiological Sciences-Biophysics.

DECLASSIFIED

**DECLASSIFIED**PROCESS TECHNOLOGYPower Level Limits

During September, the power levels were limited by the Manufacturing Department, to a maximum tube outlet temperature of 100 C at the B Pile and 95 C at the other piles. Limitations established by the Process Specifications would usually have allowed the limiting tubes to operate at outlet temperatures between 100 C and 105 C.

Process Changes

Four revised Process Specifications - Reactor Process were approved. Specifications 26, 51, 55, and 56 were made applicable to the K Piles. Improved horizontal rod designs were covered. Inflexible specifications for calculating rod withdrawal times were replaced by general methods. Some revisions to K radiation monitoring instrumentation are required by the new specification 56 and trip point settings were relaxed at low tube outlet water temperatures.

Slug Rupture Experienced in September

Uranium - One slug rupture occurred in normal uranium metal during the month. This was a side failure of a smooth surfaced, triple-dip canned piece at C Pile. This rupture occurred in a tube charged under PT 105-519-E. The metal had been subjected to outlet water temperatures as high as 110 C and failed at an exposure of 432 MWD/T.

Thorium - Two ruptured pieces were discharged from a thorium poison column at B Pile. One of these was a cap failure, with a pinhole in the weld. The other piece was split from the weld end to approximately one inch from the can end. The piece which split was at an exposure of approximately 1250 MWD/AT. It had attained calculated powers of 8 to 10 KW per foot.

Enrichment Alloy - High readings of swabs taken on the downstream dummies from a "C" Metal enrichment tube at C Pile indicate a probable rupture in the metal from this tube. The metal was discharged and has not yet been inspected.

Comparison of Triple Dip and Lead Dip Canned Uranium - Approximately one hundred fifty tubes of smooth, triple-dip canned slugs (A Lot pieces) and one hundred fifty tubes of smooth, rod-transformed, lead-dip canned slugs (B Lot pieces) have been scheduled for irradiation to 900 MWD/T exposure at H Pile so that comparative rupture rates for the two metal types may be obtained. At the present time the A lot tubes are at an average exposure of approximately 550 MWD/T and B lot tubes are at an average exposure of approximately 525 MWD/T. As yet, no failures have occurred in either group.

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 two months without incident. The remaining four tubes were charged in F Pile September 14.

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 have been irradiated for two months in D Pile.

These slugs are being irradiated for metallurgical examination and are scheduled for 200 and 600 MWD/T exposure. The tube scheduled for 200 MWD/T will be discharged in the first week of October.

Powder Metallurgy Slugs - Production Test 105-576-A - This production test authorizes the exposure of 4 control tubes at C Pile, 10 control tubes at F Pile and about 30 supplementary tubes at F Pile. All slugs in F Pile will be discharged at normal goal exposure, 675-775 MWD/T. Of the 5 tubes (4 tubes Powder Met., 1 tube standard production) in C Pile, 2 ruptures will be incurred (1 in Powder Met. and 1 in standard production). The C Pile tubes were charged September 16, and F Pile tubes may be charged after 6 weeks' experience at C Pile.

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 may be charged in October.

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. Charging was accomplished in C Pile September 2. Fifteen tubes were charged, and four of these will be irradiated to rupture.

Unbonded Slugs - Point Pressure Closure - Production Test 105-580-A - A production test authorizing the irradiation of unbonded slugs with point pressure closure has been approved. 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 contains 4 unbonded cored enriched pieces centered by 18 unbonded cored pieces and solid aluminum dummies. This tube will be irradiated to rupture.

Development Test 105-583-A - Irradiation of IQS-7 Metal and Development Test 105-581-A Irradiation of IQS-8 Metal - These tests have been approved and authorize the irradiation and special pickup of four and six tubes of slugs made from IQS-7 and IQS-8 uranium, respectively. The differences between this and normal uranium are that it is cast into slightly different sized and shaped ingots, and that the IQS-8 ingots were not hot-topped. Pre- and post-irradiation measurements will be obtained.

Unbonded and Mechanically Bonded Point-Closed 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 charged.

Production Quantities of Cored Slugs - PT 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 is being requested 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

1215276

**DECLASSIFIED**

File Technology Sub-Section

HW-32200

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 second scheduled discharge of one column from the H Pile J-Q block loading was made 9-29-54. Tube 2674-H had an approximate exposure of 75 MWD.

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 October. 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 150 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 October.

High Exposure Thorium - Production Test 105-551-A - It was necessary to discharge 1371-B on 9-20-54 due to rupture. The exposure was about 1230 MWD/AT; it had been planned to reach an exposure of 3000 MWD/AT. The ruptured piece was badly swollen; the can was split, and there appeared to be cracks in the thorium itself. This piece will be examined in the Metallurgical Laboratory. The remaining 34 pieces were examined and another slug was found with a pin-hole penetration of the weld; small bubbles were observed escaping from this hole. Many pieces were badly pitted on and near the end surfaces; severe weld attack was evident and a heavy scale was also present on the end surfaces.

The ruptured piece from 3480-B was examined in the Metallurgical Laboratory and found to have large compact masses of white powder (assumed to be thorium oxide) under the swollen areas. The can was so badly damaged that it was not possible to determine the point at which water first entered the can. The piece will be sectioned at a later date.

1215277

Fb-5

Three of the four tubes discharged under this test have contained ruptures; therefore, the remaining two tubes (2872-H and 3179-D) will be discharged at the first opportunity. A final report on the test is planned for October.

Mint Irradiation at C Pile - Production Test 105-562-A - The behavior of present fuel and target slugs at high tube powers is being investigated at C Pile. The bulk of the slugs irradiated under this test have been discharged at exposures near 100 MWD/tube. Cold-canned, hot-pressed and Al-Si canned fuel slugs reached goal exposure with no rupture incident at powers slightly less than the surrounding uranium columns. Eleven representative tubes containing weighed metal have been scheduled to exposures up to 150 MWD/tube.

## PILE PHYSICS

### K Pile Startup Program Planning

HW-32949, "Monitoring and Test Procedures - KW Dry Temperature Coefficient Test," issued during the month, presents a detailed account of the test procedures and of the arrangements for monitoring metal temperatures and tube expansion in order to perform the test safely. General agreement was then reached with Reactor Section regarding the temperature limits to be imposed and the monitoring and safety requirements. A short authorization document will be circulated for signature approval in the near future modifying the conditions outlined in HW-32949 only slightly.

A step-by-step startup program operating guide has been prepared and turned over to Reactor Section for further refinement. Talks have been given to newly assigned KW operating personnel to point out the objectives of the tests and to describe the non-routine procedures to be employed.

Fabrication of components for the various tests is progressing. The thermocouple slugs, the test hole expansion-relief flanges, and the shielding slug recovery splines required for the dry temperature coefficient test have been completed. Rubber pig-tail blanks are on order from offsite, and work orders have been issued for test hole thimbles and shield plugs and for the gas-lock box and graphite boats required for flux traverse work. Discussions have been held with the maintenance supervision recently assigned at KW concerning help they will be expected to provide during the tests and equipment they will be expected to use or provide.

Further planning work includes making up crew schedules, securing necessary data forms and tables, and performing sufficient interpretive calculations in advance to be able to apply test results as soon as possible after they are obtained.

### Product Yield and Quality

Detailed tracing of the exposure history of various batches of product ultimately fabricated into shapes indicates that the quality of low exposure material discharged at C Pile is slightly lower than that at the older piles. Values from the limited data so far indicate that the weighted low exposure level for obtaining material which exactly meets specifications would be about 215 MWD/T at C Pile and about 220 to 225 MWD/T at the old piles. As a result of discussions with Manufacturing and with Separations Technology personnel, the C Pile goal exposure was raised from 190 MWD/T average to a weighted average of 205 MWD/T.

**DECLASSIFIED**

C Pile Enrichment

As a result of the decrease in overall metal exposure in C Pile due to its low exposure program, the effectiveness of the enrichment pattern in providing a flat flux distribution fell off considerably. At the beginning of the month, the C Pile was operating with only 1400 effective power tubes, 82 partially depleted enrichment columns in the third lattice unit from the reflector, and with only 200 inhours excess reactivity held in control rods plus poison columns.

An enrichment calculation was performed based on current temperature distributions and bucklings measured during C Pile startup in order to extrapolate from the present enrichment condition to an optimum distribution. These calculations indicated that 20 to 30 enrichment columns would have to be added in the third lattice unit to provide 1600 effective tubes. After ten enrichment columns were subsequently added in the fourth lattice unit ring and light flattening adjustments were made, from 1530 to 1550 effective power tubes were observed. With so little excess reactivity available the flux distribution efficiency is almost as dependent on flattening flexibility as it is on the location of the enriched ring; by supplying reactivity for additional flattening column flexibility, a small amount of additional enrichment in this situation may thereby contribute more to production efficiency than would normally be expected.

File Safety Studies

A slowly converging series solution has been obtained for the behavior of a Hanford reactor in terms of power as a function of time, following instantaneous stoppage of the coolant flow. If numerical results from a single calculation show a satisfactory rate of convergence, the problem can be set up for IBM calculation.

Attempts at a more exact calculation of the effects on scram transient measurements associated with varying detector position have not been successful because little is known of the characteristics of Mathieu functions which arise in the analysis.

High Density Concrete Attenuation Measurements - Effects of Heating

The following table summarizes the measured densities and neutron shielding effectiveness of the various high density concrete slabs tested in the DR test wells both before and after they had been heated to 100 C for three weeks:

Type of Concrete	<u>Iron-Limonite</u>		<u>Magnetite-Limonite</u>		<u>Magnetite</u>
	<u>Before Heating</u>	<u>After 100 C for 3 wks.</u>	<u>Before Heating</u>	<u>After 100 C for 3 wks.</u>	<u>Before Heating</u>
Density, gm/cm <sup>3</sup>	4.24	4.06	3.40	3.34	3.29
Neutron Relaxation Length, cm	7.69	8.34	9.01	9.52	9.47

Interpretation of Simulated Masonite Burnout Experimental Data - Development Test 105-548-A

A numerical evaluation of neutron foil activation data in terms of biological dose has been undertaken in conjunction with the study on masonite burnout as a function

of shield thermal exposure. The steps in the calculation consisted of postulating the distribution of numbers versus energy range of neutrons not directly measurable by resonance detectors and of summing the products of neutrons times biological effect per neutron over all ranges of energy from thermal energy to 10 Mev. This analysis indicates that over 90 per cent of the total neutron dose is caused by neutrons with energies in excess of 100 kev. The approximate resulting biological dose as a function of masonite removal is given in the following table, assuming a fringe tube power of 300 kw:

<u>Shield Burnout Configuration</u>	<u>Inches Masonite Removed</u>	<u>Per Cent Masonite Removed</u>	<u>Total Dose</u>
Undamaged	0	0	10 mrem/hr.
Step 1	6	22	50
2	9 3/8	35	150
3	12 3/4	47	400
4	16 1/8	60	1000

HEAT TRANSFER

Cooling-By-Boiling Conclusions

Based on experimental data obtained from the 189-D mock-up facilities, it has been estimated that steam qualities on the order of 40 - 70 per cent can be generated safely in Hanford type process tubes operating at pressures in the range of 600 - 1000 psi and with tube powers in the range of 500 - 1000 KW. These qualities would be valid for a 28 ft. "cosine" charge, and they were based on a straightforward extension of experimental data obtained with "uniform" heater tubes at pressures up to 800 psi.

As a first rough approximation, it has also been estimated that a full operating pile could actually operate at approximately 35 - 50 per cent of the limiting quality associated with the hottest tube. For example, data indicate that an 800 KW, 28 ft., cosine tube at 1000 psi would have a limiting quality of 58 per cent by weight at the end of the slug charge; it is estimated that the pile as a whole could be operated with an outlet quality of 20 - 30 per cent.

Calculations based upon experimental data have shown, for a typical operation condition, that a cosine heat generation tube will permit approximately 40 - 50 per cent more steam quality than will a uniform heat generation tube.

The details of the above conclusions are presented in "Permissible Steam Qualities in Hanford-Type Process Tubes," W.D. Gilbert, C.R. McNutt, R. Neidner, HW-33127, 9-22-54.

Cooling-By-Boiling Experiments and Studies

Tests on the full scale mock-up continued to be directed toward obtaining burnout qualities at high pressures. A test was performed at 630 psia with a 600 KW uniform tube to check data obtained previously at approximately these conditions. Thirty-seven per cent quality at burnout was obtained on this test, 41 per cent was obtained previously. Part of the difference is known to be due to scale formation on the heater tube, and it is considered that the data are in quite good agreement.

DECLASSIFIED

Pile Technology Sub-Section

HW-32200

DEL

Tests were also conducted successfully on the short-scale (42") mock-up. These tests were over a range of pressures from 100 to 800 psia and specific powers (for C Pile geometry) from 25 to 75 KW/ft. These data are very important from two standpoints: (a) they represent the only experimental burnout points above 630 psia and (b) they represent the only data at specific powers above about 25 KW/ft. Several facts were noted from the data: (a) they agree quite closely with full scale mock-up data, (b) the permissible qualities found at 800 psia were 2 1/3 times those found at 100 psia, (c) there is no indication that quality does not increase at a linear rate with pressure for the region above 800 psia and (d) slug surfaces can be cooled-by-boiling at powers at least up to 75 KW/ft.

Further tests are planned on both mock-ups. When additional equipment becomes available, full scale tests at 800 psi and 1100 KW (23 ft.) will be conducted. Emphasis with the short scale equipment will be on obtaining data at 100 KW/ft. or higher.

#### H Loop Boiling

After a few unsuccessful attempts, boiling on a semi-equilibrium scale was achieved in the H Loop on 9-24-54. Stable boiling existed for 1 - 2 minutes with an outlet steam quality of about -8 per cent for a back pressure of 310 psia. It is very probable that equilibrium boiling conditions could have been maintained had not an air operated flow control valve operated improperly.

#### Equipment Procurement and Installation

Project CG-605, installation of the motor generator and associated equipment, was approved and foundation work (for the generator and cubicles) is in progress by Minor Construction. Foundation completion is estimated for October 8.

Work is progressing on procurement of parts to permit modification of the existing mock-up to withstand higher pressures. However, delays are already being encountered in the delivery of valves, and it is anticipated that pump delivery will also be considerably behind schedule. Consequently, more effort will be devoted to this problem in the immediate future.

#### Boiling in Pile Outlet Piping

"Boiling Pile Effluent Pressure Losses," J.M. Roberts, HW-33117, 9-21-54 was issued. It discusses the pressure drops which could be expected in the rear crossheaders of a dual purpose reactor. The conclusion was reached that the pressure drop would be on the order of 10 to 30 psi for typical conditions.

#### Tube $\Delta t$ Limits

Questions were raised as to the validity of proposed trip-before instability limits in the case where outlet pigtails were crimped. Consequently, tests were performed on the full scale mock-up to obtain an experimental answer. Excessive crimps were placed in the pigtails and it was found that these crimps had no significant effect on the  $\Delta t$  limit.

"Steam Loss at 190-B, D, F, DR, and H," M.W. Carbon, HW-33015, 10-9-54 was issued. It concerns the possibility and consequences of loss of steam at the 190 pumps.

The recommendation was made that tube outlet temperatures not be limited below 105 C. This recommendation had previously been made as part of the Technical Section Process Specifications.

### Hydraulics Studies

Further Hydraulic testing of the flow characteristics and distribution in hollow slugs has been postponed pending receipt of sufficient canned slugs that are to be used in a production test at C Pile. Since the internal coolant passage in each slug will be tapered, this will result in the internal passage through the entire slug charge having a saw-toothed cross-section. The characteristics of this high resistant flow passage cannot be determined with a sufficiently high degree of accuracy required for this particular in-pile application from the characteristics of uniform internal diameter hollow slugs.

### EXPERIMENTAL PHYSICS

#### Prototype Physical Constants Test Reactor

Construction of the building to house the Prototype Physical Constants Test Reactor and the Thermal Test Reactor is progressing on schedule. It is expected that occupancy can be effected in December. The fabrication of reactor components is proceeding on a schedule that calls for all major fabrication to be completed by November 1 and a mockup of the mechanical components, including graphite, to be made in 189-D at this time for performance tests. The fuel has been specified in detail and should arrive on site before December 15.

The summary report on nuclear hazards - HW-32791, "Summary Report of Reactor Hazards for the Prototype Physical Constants Test Reactor" has been completed for submission to the Advisory Committee on Reactor Safeguards. The analysis shows the hazards to 300 Area or the surroundings to be small under extreme conditions. The rate of reactivity addition is limited in the design to that which can readily be controlled by the safety and control systems. In the event that all safety and control systems fail to operate concurrently with reactivity addition melting of the fuel elements is expected to terminate the reaction at the 10 megawatt-second level. The reactor room is pressurized to the extent of containing all fission products released in such an excursion. Only in the extreme case in which fuel vaporization proceeds, i.e. the loss of 6 per cent in  $\Delta K$  realized upon melting the fuel is either insufficient or is realized too slowly, does the pressure buildup in the reactor room become sufficient to pass fission products to the exterior atmosphere. In this extreme event a moderate hazard to the 300 Area does exist but it does not extend appreciably beyond the area confines, and, in any event, is predicted upon very extreme and unrealistic assumptions which ignore reactor design, instrumentation, and operating procedures.

#### Slug Rupture Detection

The gamma ray spectrometer portion of the projects to replace the beta slug rupture detection systems at all operating piles with gamma monitors - project CG-578 and 579 - have been awarded to Radiation Counter Laboratory. The procurement of other components is on schedule. A formal report HW-33079, "Operating Experience with the Prototype Hanford Gamma Spectrometer Monitor for Ruptured Slug Detection," R.S. Paul, was written discussing that on pile performance of the prototype unit

**DECLASSIFIED**

operating at H Pile. This unit has operated continuously for the last eighteen months with satisfactory performance. During this time the gamma system (1) was demonstrated to possess a fifteen fold greater sensitivity than the beta systems, (2) detected several natural uranium ruptures which gave no indication on the beta system, (3) detected uranium-aluminum alloy slug ruptures, (4) performed adequately during and following purging operations, (5) was quite power level insensitive, and (6) accumulated a satisfactory history of performance regarding maintenance.

The development of the "gammascan" - a system to localize unusual gamma activity on the rear face - is proceeding satisfactorily. This system is envisioned to consist of a photomultiplier and scintillator combination mounted at lattice unit intervals on the rear elevator. The horizontal scan is achieved by displaying the output current from each detector on an oscilloscope in rapid succession with the vertical scan provided by elevator movements. Such a system may (1) localize slugs "lost" in a discharging operation, (2) quickly localize tubes containing a rupture following cross header localization by the gamma monitor and the ensuing reactor shutdown, and (3) in some instances the tube containing a rupture may be localized during reactor operation. The major portion of the photomultipliers have been received and intercompared for uniformity of gain, the phosphors are on order, the circuitry has been fabricated, and laboratory testing is underway.

#### Neutron Economy Studies

Experimental data have been obtained giving the metal temperature coefficient of reactivity over the temperature range from about 300 C to 50 C for the following: (1) uranium (two diameters), (2) thorium, (3) "J" slugs, (4) "C" slugs, (5) J-N slug loadings, (6) "E" slugs, (7) E-thorium slugs, (8) J-thorium slugs, and (9) aluminum. The necessary corrections to the experimental data are now being made to arrive at accurate coefficients for 105 pile application. There are two effects entering into the test pile measurement which complicate data reduction in some cases. The first is thermal expansion of the heated slugs which results in a temperature dependent slug disadvantage factor and the second is an apparent substantial positive temperature coefficient for aluminum - this latter effect is not clearly understood. Both complicating effects can be evaluated and accurate quantitative overall metal coefficients applicable to the 105 piles derived. However, it will be difficult to assign more than a rough quantitative value to the contribution to the coefficient by U-235 itself in a given type of loading.

The macroscopic thermal neutron absorption cross section for zircalloy was measured to be  $0.0098 \text{ cm}^{-1}$ . This value is 16 per cent higher than that evaluated from cross sections and reported impurity content.

Work is continuing in developing methods for extracting conversion ratio and resonance escape values from measured neutron distributions in natural and enriched uranium loadings. The data describing measured neutron distributions in lattices have been summarized for presentation at the ORNL Reactor Physics symposium as have the data describing metal temperature coefficients.

#### Fuel Element Studies

A systematic study to evaluate the changes in reactivity accompanying modified fuel elements for existing piles has been initiated. The effect of changes in uranium diameter and end cap thickness was independently evaluated with the

results in substantial agreement with earlier work reported by P.F. Gast. A test pile experiment yielded an end cap coefficient of  $-0.314$  inhours per mil of aluminum added between 8.4 inch uranium slugs assuming a constant length of metal column. The reactivity effect associated with uranium diameter changes is also linear over the range of interest and yields 5.6 inhours per mil increase in diameter - the latter effect is calculated and the calculations are subject to quite large uncertainties; attempts to refine them are continuing. These values mean that much of the reactivity lost through diminished long term gains in low exposure material, e.g. 200 MWD/T, may be recovered by employing a thinner can wall and end cap as observed rupture rates are small at low exposures for the present slug. The results of this evaluation are given in HW-33088, "Reactivity Effect of Uranium Diameter and Cap Thickness Changes," A.W. Thiele.

#### K Pile Startup Planning

It is presently planned to determine slug disadvantage factors and conversion ratios for pile loadings of interest or potential interest to Hanford during KW startup by loading small nine tube blocks of the experimental loadings. The details of special slug design to permit accurate neutron distribution measurements have been solved and several hundred precisely machined detectors fabricated for this work.

The instrumentation for both the experimental portion of the startup and the nuclear safety during the approach of critical and subsequent low level operation is being collected and, where necessary, modified and/or redesigned to meet unique requirements.

#### Instrument Development

Discussions with Design Section personnel resulted in agreement that the existing nuclear instrument channels at the K Piles can be readily modified to give the basic channel coverage required by the Technical process specifications. The remaining inadequacy of the K systems is in the use of "trips" which require mechanical action on the part of the chart recorders to activate the safety systems. Either electronic or relay type trips are faster and less prone to a failure rendering the system inoperative; however, some development is required to provide an adequate "trip" and this, coupled with component delivery times, may require several months in order to effect a satisfactory installation. Several interim alternatives are available so that KW startup need not be delayed. Safety system trips presently being developed for the Physical Constants Test Reactor may prove adaptable to the K Pile situation.

Modifications to both the low and high level period trip systems for the K Piles are completed and a report on this work is being written. The in-pile test of the sub-critical pile neutron multiplication monitor is about two months behind schedule - largely the result of delays in receiving the fission chamber electrodes. All components will be available for installation at DR Pile during the first outage in November.

#### Test Pile - Routine Tests

Regular metal testing proceeded routinely; the reactivity of bare slugs is improving which is in line with improvements shown over the past several months in the quality of billet eggs.

DECLASSIFIED

Forty-two Mallinckrodt billet egg lots were tested with TDS values ranging from 11 to 14; thirty-four Fernald billet egg lots were tested to yield TDS values ranging from 13 to 17. One exceptionally impure egg was found and steps to obtain a chemical analysis have been taken.

#### Test Pile - Special Tests

Several slug types, each possessing a different cladding, were tested to provide reactivity information in support of hot pressed canning development. Claddings of iron and iron-copper combinations are substantially superior, neutron economy-wise, to nickel. Tests of uranium-silicon alloy slugs containing low silicon concentrations (1850 PPM) show the 105 pile reactivity loss to be about 26 inhours.

#### MECHANICAL DEVELOPMENT

##### Charging and Discharging Studies

Work continued during the month on the equipment for segmental discharge. The spline guide was completed and a vendor is now fabricating an expanding spline. The mechanical holding slug has been redesigned incorporating several of the features found necessary from the laboratory testing.

The marking tip-off for use on ruptured slug segregation was used on two occasions at C Pile. Attempts to segregate the marked slugs during pickup operations were only partially successful. Further tests were delayed pending receipt of a paint stick made from fluorescent material.

##### Horizontal Rod Studies

One engineer was sent to Los Angeles early this month to provide technical assistance to the Asco Company, vendors for the boron carbide rings to be used in the replacement horizontal control rods. The company had encountered considerable difficulty in preliminary fabrication of the rings. Reports from the engineer at the latter part of the month indicate many of these troubles had been corrected and some satisfactory fabrication was being obtained.

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

The two built-up washer seals installed on the new rods at B and H and the molded seal on the rod at F Pile continue to operate satisfactorily.

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

##### Vertical Rod Studies

The Design Test for the vertical safety rods for K Pile was still interrupted awaiting procurement of a new tube as reported last month. In the meantime, new piston rings were fabricated from nylon strips to determine if this material would prevent the serious internal scratching of the tube which has been encountered. A set of rings was fabricated and found to operate satisfactorily with the exception

that a slight increase in drop time resulted. As a means of correcting this, additional nylon material is being obtained that is impregnated with graphite, and it is hoped that this will reduce the friction.

The washer seal installed on VSR 16-C continues to operate satisfactorily.

#### Supplemental Control

The work on disaster control systems continued during the month. The document re-assessing disaster control is being revised to compare the principal systems which have been proposed to date and discuss the control each is expected to provide.

The 63S-T6 aluminum tubing for use in the poison spline development program was received during the month and preliminary testing indicates that a spline made of this material will give the required stiffness. Work continues on the investigation to determine the optimum boron grain size. The shielding cask design is now essentially complete.

Several experimental runs were made during the month with the  $\text{BF}_3$  supplementary control system. It was determined that the control valves were not suitable for a gas system and they are being modified for this use. The test runs were made with nitrogen instead of  $\text{BF}_3$ . As soon as satisfactory operation is obtained the system will be switched over to  $\text{BF}_3$ .

#### Process Tube Assembly and Piping

The flexure testing of K Pile connectors is now complete. The data had been transmitted to Design as it was obtained and is now being consolidated into one report.

A final report is in rough draft form on the Design Test of K Pile gun barrel gas seals.

An appropriation request was submitted during the month requesting the allocation of funds for the procurement of parts and fabrication of the flexible connector flexing facility.

A production test is being prepared to permit the on-pile testing of two outlet connectors for C Pile. These connectors are similar to the ones presently installed but contain a teflon hose instead of the stainless steel bellows. The test is being conducted to determine the suitability of these connectors for tube outlet use.

Work on the design test of the high pressure loop to examine Van Stone flanges and regular pipe flanges is delayed pending receipt of the material being purchased off-site.

Test work pertaining to the establishment of new process tube allowable pressures has been completed. The data has been assembled, organized, and a report presenting the results and recommendations is being prepared.

DECLASSIFIED

Physical Constants Testing Reactor

Fabrication of the horizontal control - safety rod components for the Physical Constants Testing Reactor was stopped during the month pending the arrival of some special material. Fabrication was started on the vertical safety disc and thimble components. The analysis and selection of the steel framework required to support the leveling slugs and control rods has been completed. Graphite fabrication is proceeding satisfactorily with some of the drilling operations now complete. Building construction is progressing with the excavation complete, footing forms in place, and the reinforcing steel being installed.

Other Engineering Development Work

Specifications for the experimental television equipment for B Pile were reviewed during the month. The recommendations submitted last month concerning the feasibility of three dimensional television were adopted and work is now proceeding on the installation originally planned.

A compilation of the results of all rubber tests to date is being issued in document HW-32284. Eleven new samples have been obtained from vendors and a new series of tests is being scheduled.

Work continued on a constant level during the month on the development and fabrication of underwater saws for process tube examination work. One saw is being altered for use in slitting zirconium tubes. Tests will be conducted during the next month.

The design of a special slitting saw to remove stuck slugs from sections of process tubes was completed during the month and fabrication started.

GRAPHITE STUDIESGraphite Dimensionally Stable Under Irradiation

A second experimental graphite has been developed which appears to have improved dimensional stability under irradiation. Available exposures of about 1400 MD/CT cold test hole indicate that no samples, either parallel or transverse cuts, expanded more than .1 per cent or contracted more than .2 per cent. The samples averaged .05 per cent contraction. This material was made from coked phenol-formaldehyde resin and a resin binder. Its bulk density in present state of development is 1.23 g/cc. Other physical characteristics are low thermal conductivity, small crystallite size and low thermal expansion. Irradiation carried out in an uncooled test facility at about 450 C indicated a contraction of .12 per cent after 510 MD/CT exposure. Chemical burnout tests in the pile atmosphere indicated that the material in the present state of development has two to three times the burnout rate of graphites utilized in the stacking of present Hanford piles.

Stored Energy

Test runs are being made on a new calorimeter, designed primarily for running core samples. It uses a cylindrical sample, 1/4 inch in diameter by 1/2 to 3/4 inch long. It should, therefore, be possible to make two or three determinations from a single core. Preliminary runs to 500 C have been made at an average heating rate of approximately 15 C per minute. The instantaneous rate is a function of stored energy release as the technique used is slightly different from previous ones. At present, a temperature limit of 500 C is necessary because of oxidation, however, the calorimeter is designed to make possible the use of an inert atmosphere without serious difficulty.

Graphite Purity

Nuclear purity tests have been carried out in the Hanford 305 Test Pile on selected individual bars of TS-GBF graphite produced by the Speer Carbon Company. The results of these tests indicated a higher nuclear purity than had been previously noted. The nuclear purity of one bar measured +1.16 dih. Two other bars measured +1.15 dih. The previous high was +1.12 dih.

File Sampling Instrument

Using the re-designed core borer, two graphite cores were successfully cut from the center of 1075-F channel. The ease of operation indicated that the instrument will be successful. More rigorous tests, using fringe zone graphite are being scheduled.

Evaluation of Nitrogen As A Pile Atmosphere

PT 105-535-E, Supplement A, aims at evaluation of the corrosion aspects of a wet nitrogen atmosphere in the piles. The experiment currently being run at H has developed leaks and stoppages so that sampling of exit gases is not possible in two of the tubes. An additional one month exposure is being planned before discharge and preliminary data evaluation.

DECLASSIFIED

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

The rough draft of this production test has been written and is now being circulated for Reactor Section review. It is the objective of this test to determine the effect of additional helium in the pile gas atmosphere on fringe zone distortion trends in order to permit still further increases in pile power level without serious deleterious effects to the graphite moderator. This production test will authorize the operation of D Pile at sufficiently high power level to produce graphite conditions of 450-500 C maximum temperature with 60 per cent helium. Some adjustment of metal exposure may be necessary in order to avoid exceeding present slug corrosion and rupture limits. Some enrichment may also be necessary to provide sufficient reactivity to maintain the present flattened zone.

KW Pile Lattice Conductivity Studies - DT 105-547-E

This development test authorizes the operation of KW pile following startup in such a manner as to yield information concerning the change of pile graphite thermal conductivity with time. The test specifies that the pile gas composition will be held constant and at a composition to produce an initial 460 C maximum graphite temperature. The pile will be operated at some relatively constant power level, in the interim before replacement of the secondary pump casings, and the change in lattice conductivity will qualitatively reflect the change in the pile graphite thermal conductivity. These data will be valuable not only for checking design coring calculations but also in determining future graphite temperature distributions.

Graphite Oxidation Studies

Routine monitoring samples have been discharged from channels 1075-F and 3580-F at F Pile. The samples were exposed for 105 and 84 effective days respectively. The weight loss data show a normal oxidation rate of <1 per cent/1000 days. Samples were recharged into the channels and in channel 3461-B at B Pile.

Surface area measurements were completed on the floor plates removed from the #8 HSR channel at F Pile on August 2. The plates had been exposed to ambient pile temperatures, neutron flux, and gas composition since the failure of the rod in February. These data indicate little or no change in the extent of oxidation since the first set of plates were removed in March.

Visual examination of cores removed from channel 1075-F indicate some oxidation on the bore of the channel and little or no oxidation the filler block end of the bore. No quantitative data are yet available. Surface area measurements on samples of this size are beyond the range of the present apparatus. Studies are now being conducted to extent the range of measurement of the equipment. From the data on F Pile, namely; (1) extensive oxidation of two different sets of experimental samples (previously reported), (2) some apparent oxidation of the bore of an empty process channel, (3) little or no oxidation of plates located in a HSR channel, it can be postulated that (1) the air leakage into F Pile did not extensively damage the pile stack (2) that there is a fairly high gas flow through empty process channels but not necessarily through rod channels.

Weight losses measured on samples discharged from channel 2785-C on PT 105-536-E showed reaction rates of 2.6, 4.4, 2.6 and 2.7 per cent per 1000 days averaging  $3.1 \pm 0.5$  per cent at temperatures between 550 and 620 C in a 35-40 per cent helium atmosphere flowing at approximately 25 liters per minute. Examination of the samples showed preferential attack at locations where the samples touched the titanium carrier.

The titanium carrier produced an exposure rate at two feet in air of 23,700 mrad/hr of which 700 mr/hr was gamma. The lead cask decreased the exposure rate to 50 mr/hr at the surface which facilitated the handling of the cask.

The third set of samples was recharged into the channel. These samples are hollow cylinders 3.5 inches long having an O.D. of 0.75 inch and an I.D. of 0.32 inch. This gives these samples a surface per volume ratio (9.89/in) similar to that of the standard 4 inch - 0.425 samples (9.92/in). The samples were contained in Alsimag 222 carriers.

#### High Temperature Exposures - PT 105-403-P

Sample Series III, the fourth series of samples irradiated at controlled temperatures under PT 105-403-P, was discharged from tube 3461-B on September 20, after accumulating an equivalent cold test hole exposure of approximately 2700 MWD/CT. These samples will be recovered during the month of October, after the radioactivity of the heater assemblies has decayed sufficiently.

Two more assemblies of sample and heater sets are now being fabricated in the shops. One of these, after fabrication and testing, will be charged into 3461-B as Series V of the irradiations under this production test. The other will be retained and charged at a later date as Series VI. The Series V assembly should be completed in time to permit charging in February, 1955.

The control instrumentation on zero-far level at B File, which was used for the Series III exposure, will be rejuvenated and used for control of the Series V samples.

#### WATER PLANT DEVELOPMENT

##### Flow Laboratory

Operation of the in-pile flow laboratory facilities at 105-D continued. The first data on unfiltered water at pH 7.0 with 5 ppm dichromate were obtained; it was found that corrosion rates were one-third of those observed in normal process water or in unfiltered water at pH 7.5 with 5 ppm dichromate. Tests continued on water containing 0.2 ppm dichromate at pH 7.3 and 7.0. Steel coupon tests continued in pH 7.0 water; these tests are evaluating the possible corrosion effects of reduced pH water on the steel effluent lines.

Construction of the 1706-KE Water Studies Semi-Works proceeded with the installation of piping and equipment. Overall completion is estimated at 70 per cent. Preparation of the operations manual for the building was begun and training of operations personnel continues.

**DECLASSIFIED**

**DECLASSIFIED**Plant Tests

Operation of the low pH half-plant test continued at 100-F. Based on results of the pH work to date recommendations were made to install acid addition equipment at all areas, including the X plant. The reduced dichromate (0.5 ppm) test at 100-D continued.

Investigation of the feasibility of a full pile unfiltered water test continued. It was determined that a full pile test is practical at the DR plant. Also, valuable information on corrosion, film, and effluent activity could be obtained from this test. The long term economic factors of using unfiltered water are still under investigation.

Recirculation Studies

The H Loop facility operated on recirculation throughout the month under conditions of 155 C outlet temperature and 2 megohm-cm resistivity water. The tube and slugs were discharged for examination after an exposure of 52 days. A zirconium process tube was received for installation in H Loop. Since the tube is considerably off-standard regarding straightness and rib configuration, several tests were made to assure that the tube can be safely installed and charged. The initial charge consists of aluminum-jacketed slugs and an outlet water temperature will be maintained at 180 C. Isothermal loop ELMO-2 completed a 70 day run at 175 C testing an aluminum tube and slugs; a report covering the results of this test is in preparation. The loop is now operating at 185 C using a zirconium process tube and aluminum-jacketed slugs. ELMO-4 operated for several three-day periods at 230 C; the make-up water injection system was completed to permit longer operating runs. This test is evaluating the performance of aluminum slugs in contact with zirconium in high purity water. Equipment layouts for ELMO-5 were completed, and construction is expected to begin in October. This loop will be fabricated of carbon steel.

Several detailed design prints of the KBR recirculation facility were reviewed. Recommendations were made to fabricate one of the four loops of carbon steel; also studies were made to determine hydrogen addition and sampling system requirements.

Boiling Studies

Two in-pile boiling tests were conducted in the H Loop facility during the month. In the initial test the pile was scrammed due to a pressure surge at the start of boiling. Analysis of the difficulty showed that the automatic flow control orifice sensed an artificial flow increase at the start of boiling. In the second test the flow control was operated manually and stable boiling conditions were obtained for about two minutes at 220 C and 15 per cent quality; tube power was approximately 245 KW. Following this, an attempt to adjust flow rate resulted in a flow surge and the pile was shut down. The mock-up boiling loop ELMO-3 operated throughout the month at 10 per cent quality, 185 C; this loop will be discharged early in October. Corrosion testing of aluminum tubes and slug jackets in steam water mixtures continued. Examinations were made of a tube and slugs operating for six weeks in steam qualities varying from 100 per cent, 190 C, at the inlet to 20 per cent, 180 C, at the outlet. Severe pitting was observed at qualities above about 50 per cent; at lower qualities both tube and slugs were in excellent condition.

FILE COOLANT STUDIESProduction Tests

A ruptured slug was found after the C Pile shutdown on September 2, 1954, in tube 2679-C operating at an average outlet water temperature of 102 C under PT 105-519-E. This tube which had reached an exposure of 517 MWD/T operated at 744 KW and had reached outlet water temperatures as high as 115 C. The ruptured slug was one of the uncoated slugs in the tube, half of the slugs having been coated for abrasion resistance. From the weight loss of the adjacent slugs it is estimated that 10 mils of aluminum had been removed from the slug jacket. This and other slugs in the tube showed no evidence of pitting attack. The corrosion rates of several slugs in the tube were higher than would be predicted from extrapolation of lower temperature data. A maximum weight loss of 28 grams corresponding to 14 mils of penetration occurred in this tube. A second tube, 2975-C, was discharged at 560 MWD/T and showed a maximum corrosion rate corresponding to a total loss of 12 mils of aluminum from the slug jacket. Corrosion was uniform on all the slugs in this tube also.

D Pile operated without unusual incident throughout the month under PT 105-542-E which authorizes 0.5 ppm dichromate in the water to one-half the pile.

A supplement to PT 105-540-E allowing the use of zirconium jacketed slugs was written. It is intended to charge these slugs into both aluminum and zirconium process tubes.

Corrosion Monitoring

Five process tubes were examined during the month with no new or unusual corrosion observed. Inspection of the 100-H downcomer showed it to be in good condition. No serious corrosion was found under the blisters in the Amercoat coating. The west side of the 183-F chemical addition line operating at pH 7.3 was found to be in good condition.

The region at the water line in the number 3 190-C storage tank was found to be more corroded than the rest of the tank. Considerable loose scale was found at this air-water interface.

The first of the newly-developed tube slitting saws was installed in the D tube examination pit. The modified borescope for Van Stone inspection was tested at B Pile and found generally satisfactory. Better leak-proofing was found necessary and has been accomplished. Further evaluation of the instrument as a means of detecting faulty Van Stones is in progress. Testing of the Probolog as a means of detecting severely corroded process tubes in the piles showed the present probe to be too sensitive to local pitting. Shell Development Company is being contacted to provide a probe which is preferentially sensitive to wall thickness.

Laboratory Corrosion Studies

An Al-Si slug containing a 1/16 inch side hole was ruptured in the glass tube after operating at 150 C in raw water. At 24 hours corrosion product began to extrude from the hole forming a pillar which touched the glass tube wall. For the next five days this pillar enlarged. Finally on the sixth day a large

DECLASSIFIED

File Technology Sub-Section

HW-32200

DEL

blister developed and rapidly erupted through the can. Five hours later the tube shattered probably from the pressure of the swollen uranium oxides on the tube. A striking similarity in appearance and probable history exists between this slug and many side failures that have occurred in the piles.

Minutube and mock-up testing of aluminum and zirconium in pH 7.3 process water and softened water continued during the month. Corrosion in pH 7.3 soft water at high temperatures is more uniform than was found at pH 7.6. 150 C appears to be an upper limit from a scale formation standpoint for pH 7.3 process water.

A number of hot press slugs have been placed under flow laboratory test to determine their corrosion characteristics. Both internally and externally cooled slugs as well as solid slugs with large and small grain jackets are being exposed to 110 C process water.

The filtering characteristics of cation exchange resin Duolite C-10 are being determined. Its use as a replacement for the anthrafilt in the filter plant is under consideration. The test includes a determination of its softening capacity after repeated cycling as a filter material. Because of the low exchange capacity of C-10, other resins are also being considered for this purpose.

Galvanic attack of aluminum coupled with nichrome wire in process water was found to be not serious. The proposed use of nickel-containing alloys for surface thermocouples by the Heat Transfer Sub-Unit appears to be safe from a corrosion standpoint.

A study is underway of the effect of gases dissolved in the process water. Calculations indicate that the permanent gases in the river water do not come out of solution in the process tubes. However, irradiation decomposition of the water may produce hydrogen and oxygen bubbles in the active zone.

#### SPECIAL IRRADIATIONS

The accumulated exposure for the energy release in a single process channel (Bluenose, HOO-270) at C File is now above 450 MWD/T. Preliminary calculations indicate that the accuracy of the data will be better than one per cent.

Studies pertaining to the creep of nickel specimens in the eighth creep assembly charged into F File August 2 have been completed. Mock-up studies of the ninth experimental assembly of the series of creep specimens showed the assembly to have a gas leak. The leak has been repaired, and it is planned that the assembly will be charged at the October 20 shutdown.

Design specifications for the modified high pressure, high temperature recirculating loop for KAPL are complete except for minor revisions. Design of the facility is proceeding rapidly. A decision has been made to install the new components on the X-2 level of H File. The A test hole on the X-1 level will still be retained for the in-pile tube.

The instrument assembly of the existing loop has been dismantled to permit the instruments to be overhauled in preparation for the modification. Removal of

out-of-pile recirculating components not required in the modification has begun.

Canned cobalt samples from Oak Ridge (ORNL-183) were received for charging into H Pile. Inferior welds on all samples required that they be sent back to Oak Ridge for recanning.

Samples of zirconium process tubes (HAPO-105) were charged into the X hole at H Pile on September 30 as a part of a program to study the reaction of the pile atmosphere with a zirconium-graphite couple. In the second phase of this program, an annulus tube will be charged into a pile in November, following mock-up studies. The purpose of this study will be to determine the effect of pile atmosphere impurities on zirconium and zircalloy specimens. The production test authorizing the annulus tube installation has been approved.

The irradiation of zirconium and zircalloy process tubes (HAPO-110) continues to be delayed by the arrival of process tubes. The production test for this irradiation has been approved in rough draft; formal approval is now being obtained.

An out-of-pile mock-up has been made to make heat source studies of pile gammas to obtain information in support of the design of the in-pile assembly for the study of steam-graphite-zirconium reactions (HAPO-111).

An assembly has been completed for the study of the effects of pile radiations on thermocouples (HAPO-135). Charging of the assembly into the Snout I facility of H Pile will be delayed by other irradiations of higher priority.

The three tubes at H Pile, charged with experimental assemblies to study the in-pile reaction of nitrogen and graphite at ambient pile temperatures (HAPO-140) continue to be exposed. Difficulties are still being experienced in maintaining a satisfactory gas flow through these tubes. Further pressure testing to evaluate the difficulties will be performed at the next shutdown.

Design specifications for high intensity gamma radiation facility have been firmed up and design is now in progress. This facility will employ a 100,000 curie cobalt source. It is planned that the installation will be at KW Pile.

The C Pile water piping project (CG-556) is scheduled to be completed in October. Essentially, all installations have been completed.

In the performance of liaison activities, attention has been directed to the Snouts being installed at KW Pile. Initial installations of these facilities were made incorrectly, and revisions were required to insure their satisfactory functioning. In a second matter, there is reason to cast some doubt upon the reliability in some instances of the K-Rashfield material being used for the test hole shielding as being completely satisfactory. Samples of this material have been obtained and will be exposed immediately to determine the effects of irradiation on this material.

The pneumatic facility, to be installed in KE Pile, has been received by Kaiser Engineers. A testing program to evaluate the limits of the facility and also the characteristics of various rabbit materials has been drafted. Tests pertaining to this program will be performed by Kaiser personnel as a portion of the acceptance tests for this facility.

**DECLASSIFIED**

Studies are being made in support of the design of discharge equipment for the new facilities at the K Piles. Attention is first being given to the auxiliary equipment which will be required in the operation of Snout II and Snout III.

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 REPRESENTATIVES' ACTIVITIES

Project CA-512-R

Discussions were held concerning the effect of revising Process Specification No. 56.00 on K File instrumentation. The following conclusions and recommendations were agreed to:

1. Nuclear instrumentation (Beckmans), although installed according to original design criteria, are not adequate.
2. It will not be possible to modify the instrumentation sufficiently prior to start-up to meet existing specifications.
3. Minor modifications should be made to enhance safety at KW during an interim period (not to exceed 90 days) until a completely satisfactory system can be supplied.

Project CG-558

Major emphasis during the month was scoping the H and F Area portions of the project. Tentative revisions to the construction schedule indicate that the first major shutdown is at least two years away. Progress on procurement of replacement rods is slow. It appears that the first installation will not be before February, 1955.

POWER PILE ECONOMICS

An analysis was made to determine the effect on required fuel exposure and allowable reactor capital costs of the various factors which determine the total costs of electric power. It appears that both the required fuel exposure and the allowable reactor capital costs are sharply affected by the competitive price of power, the rate of fixed charges, the achievable plant factor, and on other factors as well.

Work was concluded on a study to determine the separate effects of lattice spacing, specific heat generation, and total reactor power on capital and unit costs of electric production. A study to determine the economic advantages of in-pile boiling in the power reactor has been substantially completed. Both studies have been somewhat approximate due to difficulties in relating construction cost estimates to process variables.

INVENTIONS

All persons engaged in work that might reasonable 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.

*R. B. Richards*

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

**DECLASSIFIED**

**DECLASSIFIED**

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

SEPTEMBER, 1954

VISITORS AND TRIPS

F. J. Wall visited here from Dow Chemical Company, Denver, Colorado, September 16 and 17 on 200 West measurement methods.

D. O. Darby visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, September 16 and 17 for process consultations.

R. Miller visited here from Dow Chemical Company, Denver, Colorado, September 16 and 17, for consultations with persons in 200 West.

S. Katz, Carbide and Carbon Chemical Corporation, Paducah; R. Jordan, Carbide and Carbon Chemical Corporation, Oak Ridge; and R. Thalgott, A.E.C., Oak Ridge, visited here September 16 and 17 to attend feed meeting and observe UO<sub>3</sub> program.

K. M. Harmon attended the ACS meeting in New York, September 13 through 15; X-10, Oak Ridge National Laboratory, September 16 and 17 on slag and crucible recovery installation and Dow Chemical Company, Denver, Colorado, September 20 for development work in plutonium chemistry and metallurgy.

J. G. Bradley visited National Lead Company, Cincinnati, Ohio, September 15 through 17, for process consultations.

K. L. Adler and R. E. Tomlinson attended the ACS Meeting in New York September 13 through 15 and Brookhaven National Laboratory, Upton, Long Island, September 16 and 17 for discussion of waste processing problems.

R. G. Geier visited Oak Ridge National Laboratory, Oak Ridge, Tennessee, September 20 and 21 on homogeneous reactors; Chem Pump Corporation, Philadelphia, Pennsylvania; and attended the Instrument Society of America meeting in Philadelphia, September 23.

M. K. Harmon attended the ACS meeting in New York, September 13 through 17 and Knolls Atomic Power Laboratory, Schenectady, September 20 and 21 for consultation on technical problems involving Chemical Development.

O. F. Hill attended the ACS meeting in New York, September 13 through 17 and X-10 and X-25, Oak Ridge National Laboratory, September 20 through 22 on metallurgical waste recoveries, Separations Technology, UO<sub>3</sub> technology and reactivity problems, and homogeneous reactors.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	<u>August</u>	<u>September</u>
Administrative	2	2
Contact Start-Up Engineering	4	4
Development	83	82
Process	47	50
Analytical Laboratories	34	33
	<hr/>	<hr/>
Total	170	171

1215298

**DECLASSIFIED**

Chemical Development: Two Technical Graduates - Rotational were transferred in from Reactor Operations, two Technical Graduates - Rotational were permanently assigned, two Engineering Assistants (summer employees) terminated to return to college.

Plant Processes: One Laboratory Assistant "D" was transferred in from Plant Auxiliary Operations, one Steno-Typist was transferred in from Plant Protection and one Junior Engineer was promoted to an Engineer II.

Analytical Laboratories: One Technical Graduate - Rotational terminated.

### PUREX DEVELOPMENT

#### Chemical Engineering Development

Prototype Pulse-Column Tests - Fifty-eight Purex process test runs were carried out with "cold" uranium in approximately full scale prototypes of the proposed Purex Plant "C" type, IB extraction, 2A, and "O" type pulse columns. Among the more important general objectives of this work were (a) to study pulse column design modifications and flowsheet modifications which might increase the capacity of the Purex Plant solvent extraction battery and the uranium concentrators to 25 tons U/day, instantaneous rate, and (b) to investigate, at nearly full scale, promising stainless steel designs for internals for those Purex pulse columns ("C" type, 2A, and "O" type) for which plastic (fluoroethene) internals are currently specified.

Purex Chemical Flowsheet HW #3 was employed as the basic chemical flowsheet, with indicated experimental departures. In the 2A Column runs uranium was used as a stand-in for plutonium.

Seventeen 3 inch diameter glass pulse column tests were made in support of the large scale studies.

The highlights of the new findings are as follows:

1. Replacement of the (unindented) fluoroethene sieve plates of the "C" type columns (tested on the 27 inch diameter scale) with stainless steel nozzle plates permitted attainment of uranium losses in the neighborhood of 0.001 per cent from an 18 foot high plate section under a variety of operating conditions at superficial flow rates corresponding to 4 to 26 tons U/day in a Purex Plant size (34 inch diameter) column. These results were obtained with 4 inch spaced nozzle plates with 1/8 inch holes, an approximately 0.05 inch nozzle (indentation) depth, and 10 per cent free area.
2. Twenty-seven inch diameter nozzle plate packed "C" type column tests at approximately 25 tons U/day (equivalent rate, 34 inch diameter column basis) with the ECX (aqueous extractant stream) heated to approximately 150 F. indicated the feasibility of reducing the ECX:HCF (aqueous-to-organic) flow ratio to approximately 50 to 60 per cent of the HW #3 Flowsheet ECX:HCF ratio (or 60 to 70 per cent of the HW #3 Flowsheet ICX:ICF ratio), with uranium losses from the 18 foot high plate section remaining well below 0.1 per cent. Reduction of "C" column aqueous-to-organic flow ratios increases the uranium processing capacity of the associated uranium concentrators approximately in inverse proportion to the column flow-ratio change.

T215299

3. In 27 inch diameter IO Column tests with the nozzle plate cartridge described under 1, above, a superficial throughput rate corresponding to a 24 ton U/day rate, based on a 34 inch diameter (Purex Plant size) IO Column was readily attained with highly stable operation.

#### Technical Manual

On September 25 the preparation of the Purex Technical Manual was approximately 51 per cent complete.

#### Mechanical Development

Pump Development - The pump development program which has been in progress for several years has had as its objective the development of improved pumps for handling H.A.P.O. process solutions. The experience obtained in this program led to the decision to use deepwell turbine pumps in the TBP Plant, and later in the Purex Plant. The operation of large deepwell turbine pumps in the 321 Building has for the past several months been directed toward confirming the applicability of CSGBF pile graphite as a bearing material. This program is now completed and other materials which have exhibited favorable characteristics in the bearing test machines will be tested in the pumps.

Bearing Development - Work is continuing in the search for a material which will perform acceptably as a process solution lubricated sleeve bearing against a stainless steel journal in boiling 65 per cent nitric acid. The best material found to date has been CSGBF pile graphite. While its chemical inertness is satisfactory, it does not possess the ultimate in bearing

**DECLASSIFIED**

Irradiation of Kel-F - The flexural fatigue testing of ten sample coupons from Kel-F sieve plates irradiated in dissolver solution and by the F-Pile basin gamma source to between  $2.6 \times 10^5$  and  $2.6 \times 10^7$  rads continued. The coupons have been flexed without failure for  $2.1 \times 10^6$  cycles (equivalent to 1460 plant days) at a stress of 75 lb./sq. in., which is about 2 1/2 times as high as they will be subjected to in the Purex Plant columns.

#### REDOX DEVELOPMENT

Semiworks Dissolver Studies - Three pilot-plant-scale fuel element dissolution runs were completed in the 321 Building dissolver employing mercury catalyst to dissolve the aluminum cans. The dissolutions were carried out using a three cut flowsheet which utilized 1.5 M ANN plus 0.0055 M  $\text{Hg}(\text{NO}_3)_2$  (equivalent to 5 per cent  $\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$  based on the weight of the aluminum) as a catalyst for aluminum jacket dissolution. Two subsequent uranium cuts were made with 45% nitric acid.

No difficulties were encountered in the dissolver operation during either the the aluminum or uranium cuts which required from 5 to 6 hours each. It was found, however, that the ANN removed only 50 to 60 per cent of the aluminum jacket and that hydrogen was evolved at a rate which reached a peak of 0.188 std. cu. ft./min. (3.2 volume per cent of the off-gas flow).

#### URANIUM RECOVERY DEVELOPMENT

##### Process Studies

Fission Product Flowsheet - A fission product flowsheet for series operation of the TBP Plant at essentially HW #6 Flowsheet conditions has been prepared for issuance. As is indicated on the flowsheet, when 1 year aged uranium waste is processed in the 2 cycle series TBP Plant, recovered uranium meeting fission product activity specifications (less than 100 per cent of aged natural uranium beta and gamma activity) should be produced.

##### Continuous Calcination

Shop work on the 16 inch diameter by 8 foot long reactor is approximately 80 per cent completed, and the feed system is being installed.

#### MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

##### Process Studies

BiPO<sub>4</sub> Process Waste Scavenging - Based upon Chemistry Unit Laboratory data, a flowsheet (HW-33184) has been developed for the nickel ferrocyanide scavenging of BiPO<sub>4</sub> Process first cycle waste. In developing the first cycle scavenging flowsheet, it was assumed that the present practice of combining coating removal waste with neutralized first cycle waste would be abandoned in favor of separate treatment for the two wastes.

Alternative Method of 200 Area Processing - In addition to the TBX Process (discussed in last month's report) a number of other processing schemes are currently being considered for the processing of the increased uranium requirements of the low MWD/T program at Hanford. The major schemes for which operating costs are currently being developed: TBX, BFX, Redox Phase IV, and Bitrex. Study of the relative technical and economic merits of the alternative low MWD/T program separation processing schemes is in progress.

Process Chemistry

Bitrex Feasibility - As a possibility for coupling the Bismuth Phosphate process to the Redox process, a novel scheme known as "Bitrex" has been proposed by a member of the Design Section. It consists of metathesizing the first  $\text{BiPO}_4$  extraction precipitate with  $\text{KOH}$ , and dissolving the resultant plutonium and  $\text{Bi(OH)}_3$  in  $\text{HNO}_3$ , this solution then to be piped to the Redox Plant.

The metathesis step was studied in both the laboratory and semiworks in 1945, and a series of plant production tests was conducted (also in 1945) which showed that metathesis was feasible if the resulting increase in time cycle could be tolerated. Laboratory tests are currently in progress to determine whether the acid solution of  $\text{Bi(OH)}_3$  metathesis cake can be successfully processed through the Redox Plant. It is concluded from initial data that Bi contamination of the product streams would not be a serious problem. However, subsequent experiments involving Pu the formation of a precipitate in the aqueous phase was observed during IA extraction contacts. This is presumably due to the removal of the  $\text{HNO}_3$  from the aqueous phase by the hexone and the consequent formation of the relatively insoluble bismuth subnitrate. The same precipitate would be expected to form under feed preparation acidity adjustment with  $\text{NaOH}$  to  $-0.2 \text{ M HNO}_3$ . A Bi-Cr complex precipitate was also formed on standing when the bismuth nitrate solution was added to acid-deficient IAFS systems containing  $\text{Cr}_2\text{O}_7$ . These observations are not encouraging and would appear to indicate that the Redox acid-deficient flowsheet and the proposed Bitrex coupling are incompatible without some changes in the flowsheet.

HOT SEMIWORKS

Conversion to Purex

The status of the conversion of Hot Semiworks facilities to the Purex process as of September 25 was reported as 96.5 per cent complete. This includes the waste self-concentrator which was estimated to be 58 per cent complete. Beneficial occupancy of both A and C Cells has been accepted by Technical, C Cell having been accepted on September 14. All major construction will complete testing on October 8. The ready-for-use date for B Cell is scheduled as October 12.

Mechanical Development

The testing of Chempumps of the type to be used in the Hot Semiworks continued. Three units are undergoing tests from which it appears that pile graphite bushes and stainless steel or Stellite No. 12 journals will prove satisfactory.

REDOX PROCESS TECHNOLOGY

Process Performance

In general, process decontamination performance was as indicated in the following table:

	<u>Gamma Decontamination Factors (dF)</u>	
	<u>U</u>	<u>Pu</u>
Head-End	0.3	0.3
First Cycle	3.7	3.5
Second Cycle	1.1	2.5
Third Cycle	1.0	1.4
Overall	6.1	7.7

**DECLASSIFIED**

The uranium decontamination continued to be inadequate for production of specification product ( $dF = 6.5$ ) because of entrainment of aqueous phase from the decontamination to the stripping columns, particularly from the 2D to 2E Column. Plutonium decontamination continued to be excellent; in fact, it was outstanding.

Testing and evaluation of changes in Uranium Cycle flowsheets were continued in an effort to effect an improvement in overall uranium decontamination. The increase in IAF temperature from 50 to 70 C, initiated last month, was continued but no conclusions have been drawn. Three new modifications were employed in the Second and Third Uranium Cycles.

1. On September 3, the 3DA composition was changed from water to 0.5 M  $HNO_3$  in order to reduce the phase disengagement time in the 3D Column. No immediate increase in the overall 3D Column decontamination factor was noted, but within a week the decontamination factor had increased from approximately 3 to 10.
2. After operation of the 2D Column since August 23 on a time-tested single scrub flowsheet without significant change in the decontamination factor, the 2D Column flowsheet was changed on September 14 to that of the 3D Column. No immediate effect was noted, but a 2D Column interface displacement on September 17 may have masked any improved de-entrainment performance for a period.
3. On September 22 the point of addition of the caustic butt to the F-2 ICU Concentrator was moved from the top of the de-entrainment tower to the pot itself. This change was made in order to eliminate the possibility of caustic washing hexone decomposition products from the concentrator vapors into the uranium solution.

Evaluation of these changes which is still in progress at month end has been hindered by such incidents as shutdowns and start-ups, waste rework and "green" metal early in the month, IA and 2D Column flushes on September 22, and re-processed IAF on September 17 and 23. However, with the aid of the continuous gamma monitor for the 2DU stream which is currently being installed, further definition of this difficult problem should be enhanced. Since the most significant improvement in decontamination performance has been associated with the first cycle, it appears that limitations on the nature of recycle materials is the most influential action in return to normal operation.

Backcycling of aluminum nitrate from the Third Uranium Cycle to the Second Uranium Cycle was not employed during the month because of the unstabilized performance of the Uranium Cycles.

#### Feed Preparation

The dissolvers were charged with uranium having an average pile exposure of 634 (520-762) MWD/T and "cooled" approximately 117 days. One charge to B Dissolver on August 20 apparently had the equivalent of one bucket of approximately 25 day "cooled" metal (based on the U-237 content of the resultant uranium product). The semi-continuous acid addition technique for dissolving remained essentially unchanged. The scheduling of coating removal and dissolving to minimize the emission of ammonium nitrate from the stack has been continued.

1215303

All IAF batches were oxidized with permanganate Head-End treatment procedure using chromic nitrate as the reductant and employing partial scavenging with manganese dioxide. Variations in the amounts of permanganate and chromic nitrate added to different IAF batches were required because of the changing concentrations of reducing agents present as a result of waste rework and 231 and 234-5 Building recycle. Special processing of three IAF batches was required because of G-5 Centrifuge Feed Tank jet failures and H-2 Centrifuge overflow during cake washing. Considerable additional study and probably special treatment of recycle will be required before the uranium decontamination problem is completely solved.

### Waste Processing

Hexone-Vapor Ignition - On September 7, a hexone vapor ignition apparently occurred in the D-13 Waste Receiver. Coincident with the explosion, the D-13 agitator failed mechanically. The agitator failure is believed to have been the immediate cause of the incident, and the ineffectiveness of the inert gas blanketing system was due to excessive air in-leakage into the vent system which is maintained under slight vacuum. No significant spread of contamination resulted from the incident. However, all of the jumpers on the D-13 tank were either broken by the bent agitator shaft or bent as the top of the tank was bowed upwards.

Underground Storage - The temperature profile in the three-foot diameter test tank in 101-SX Waste Storage Tank changed slightly during the month. The temperature at the bottom of the tank rose from 257 F. on August 30 to 270 F. on September 23. During the same period, the supernate temperature rose from 186 F. to 208 F. In a previous report it was noted that the maximum temperature in the test tank occurred at the four foot level. About the middle of August the temperature at this level started to decrease gradually from a maximum of 263 F. to a minimum of 246 F. on September 8. On September 23 this temperature was 250 F. No evidence of bumping in the tank has been seen.

### Process Chemistry

Entrainment in U Cycle Organic Streams - Examination of Redox Plant organic 2DU samples during this period has verified the previous observations that solid materials and an average of 0.1 volume per cent aqueous are being entrained in the 2DU organic stream. Clarification of these plant organic samples by centrifuging or long settling times (2 to 5 hours) has consistently given an arithmetical gamma D.F. of 10 to 20. Although the source and cause of this entrainment are not established, the usually suspected emulsifying agents in the Redox process are colloidal or gelatinous forms of silica, tin, aluminum, and zirconium. Zr polymeric forms or colloids can be formed under Redox acid-deficient conditions, and may either act as emulsifying agents in themselves, or be collected (at organic-aqueous interfaces) as the result of primary emulsions caused by other agents; e.g., silicic acid. Experiments to give both additional clues and possible methods for an empirical solution to the problem are in progress.

When synthetic 2DU was contacted (in the laboratory) with water in an apparatus consisting of preferentially organic-wet surfaces, severe aqueous-in-organic entrainment resulted. Using an organic-to-aqueous volume ratio of 3:2, it was found that the addition of 0.5 M  $\text{HNO}_3$  to the aqueous phase prevented the

1215304

**DECLASSIFIED**

entrainment entirely. After batch contacts showed that no deleterious solvent-extraction effects resulted from the additional acid the Redox plant 3DA was made 0.5 M  $\text{HNO}_3$ . A marked improvement in third cycle decontamination has since occurred although it did not become evident until after a week of operation with the altered flowsheet.

## URANIUM RECOVERY PROCESS TECHNOLOGY

### Tank Farm Activities

Approximately 3640 net gallons of stored metal waste were removed by water sluicing and direct transfer of supernatant for each ton of uranium processed at the tank farms. Water sluicing increased the volume by about 4920 gallons per ton of uranium processed. Ninety-one per cent of the uranium was aged a minimum of 3.1 years since pile discharge, after irradiation to an average 371 MWD/T; five per cent was a blend of TX Farm feeds with a calculated weighted minimum age of 3.0 years after irradiation to an average calculated 459 MWD/T; and four per cent was aged a minimum of 2.2 years after irradiation to 582 MWD/T. West Area (TX) transfers to TBP were held at a low level due to the lack of significant quantities of feed aged over three years, and test operation employing feeds from 107-TX Tank, aged a minimum of 2.2 years. Sustained utilization of continuous water sluicing-blending techniques, and operation of the CR facility for blending supernatant from the BX-BY Tanks permitted satisfactorily high removal rates at East Area.

### Feed Preparation

Routine tank farm blending, and TBP Plant butting operations utilized about 12,190 pounds of 100 per cent nitric acid per ton of tank farm uranium processed to give an average concentrated feed titratable nitric acid concentration of 3.60 M, following 65 volume per cent boil-off. The titratable nitric acid concentration was adjusted from 3.3 to 3.7 M to compensate for (1) an increase in the sodium to uranium mol ratios from flowsheet (ca.15) during the first half of the period to as low as five during the latter half of the period, and (2) the processing of up to eight weight per cent of the feed uranium from 2.2 years minimum aged storage. Non-routine feed handling included (1) concentration of above-gamma-specification RCU batches, containing about 17.3 per cent of the new feed uranium, to one pound of uranium per gallon (0.5 M U) followed by butting to one pound of nitric acid per gallon (2 M  $\text{HNO}_3$ ) for feed to the solvent extraction batteries, and (2) the processing, by blending, of Redox Plant UNH along with Tank Farm feeds.

### Waste Handling

About 4040 gallons of concentrated, neutralized salt waste, containing an average of 0.72 per cent of the new feed uranium, at an average pH of 9.8, were returned to storage for each ton of new uranium processed. The volume of waste returned to the tank farms was greater than the volume removed, primarily because of RCU and Redox rework processing. An additional 0.07 per cent of the new feed uranium was lost in low activity wastes routinely cribbed at a rate of about 21,690 gallons per ton.

Waste scavenging, using nickel ferrocyanide as scavenger for the long-lived fission products  $Cs^{137}$  and  $Sr^{90}$ , is expected to commence at the end of September or early in October.

### Solvent Extraction

#### Operating Conditions

The solvent extraction batteries operated at about 86 and 81 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 at  $55 \pm 5$  C., RAIS at 6 M  $HNO_3$  from September 12, 1954 to September 23, 1954, and the use of three weight per cent sodium carbonate as solvent wash as described, below, under "Solvent Treatment". Nominal instantaneous single line operating rates ranged from 100 to 238 per cent of nominal design input rate to give an overall plant processing rate of 128 per cent of design. The total uranium processed included 66.4 per cent Tank Farm feed, 21.5 per cent Redox Plant rework, 0.4 per cent Conversion Plant (224-U) rework, 11.5 per cent RCU rework, and 0.2 per cent of TBP Plant (221-U) sump material. The Tank Farm feed gamma activity averaged about 0.32 curies per gallon, equivalent to  $4.2 \times 10^6$  per cent of aged natural uranium gamma.

#### General Performance

RAW losses averaged 0.4 and 0.1 per cent of the feed uranium in "A" and "B" Lines, respectively. Steady state losses ranged from 0.02 to 0.1 per cent of feed under operation at 55 to 60 per cent of "pinching L/V". Transient high losses were experienced at the time of routine RA Column interface jet outs (up to five per cent), and during one period when the uranium feed rates were high and only 105 per cent of nominal flowsheet RAX was in use (8.9, and 0.6 per cent for "A" and "B" Lines). Losses during rework operations averaged generally less than 0.01 per cent of the feed uranium.

RCW losses averaged 0.1 and 0.02 per cent of the feed uranium in "A" and "B" Lines, respectively. The higher, erratic losses in "A" Line continued to be experienced at higher nominal L/V's than those employed in "B" Line and, although possibly influenced by generally higher solvent  $E\alpha$  values, appear to be rather due to instability requiring pulse frequency reduction to 65 or 70 cycles per minute. The "B" Line losses were steady, ranging from 0.02 to 0.03 per cent of feed uranium, and were realized, without instability, at a pulser frequency of 85 cycles per minute. No effect of solvent  $E\alpha$  was noted in either line, nor did the change from 115 to 105 per cent of nominal flowsheet RAX flow result in any significant change in losses.

Gross gamma decontamination factors, logarithmic values, ranged from 4.3 to 3.9, as sodium to uranium mol ratios ranged from 20 to 5, and gave RCU fission product gamma activities from 240 to 500 per cent of aged natural uranium. Employment of 6 M nitric acid in RAIS, and concurrent reduction of nominal RAX flows from 115 to 105 per cent of flowsheet rates resulted in no measurable improvement in overall dF's. Test batches containing from four to eight per cent of the uranium from 107-TX, aged 25 to 36 months after irradiation to an

DECLASSIFIED

average 582 MWD/T, and having a sodium to uranium mol ratio of about 13, were processed with dF's from 4.4 to 4.2 giving RCU fission product gamma activities from 200 to 270 per cent of aged natural uranium. Rework operations gave generally satisfactory product RCU under conditions ranging from 10 to 100 per cent rework uranium processed along with new Tank Farm feed uranium.

DBP in RCU product averaged about 30 parts of DBP per million parts of uranium. Preliminary laboratory data, to be developed more extensively and reported by the Applied Research and Chemical Development Units, show that, under the conditions of temperature and flowsheet currently employed in the TBP plant, hydrolysis of dissolved TBP may result in attainment of this level, 30 parts per million parts of uranium, within 10 to 20 hours after RCU production. High solvent E<sub>A</sub> values may result in increasing the initial DBP concentration and thus increase the net final value after hydrolysis of dissolved TBP. An immediate stripping of TBP from RCU is a potential method for minimizing calcination difficulties due to DBP-induced pot foaming.

#### Solvent Treatment

No new in-line solvent treatment techniques were employed during the report period. The two-stage washing of "A" Line solvent and one-stage washing of "B" Line solvent, with both RO Columns out of service except for use as a phase decanter in "A" Line, was continued since initiation on June 30, 1954, without evidence of significant differences in solvent cleanup efficiency between the two lines. Uranium, fission product gamma, and dilute RC uranium distribution ratios, E<sub>A</sub>'s, in "A" and "B" Line ROO (RAX), respectively, averaged 7.3 and  $5.7 \times 10^{-6}$  pounds of uranium per gallon, 36 and 23 microcuries per gallon, and 0.011 and 0.009. Overall solvent cleanup data for the eight weeks of operation under current conditions show two-stage washing to be no more effective than one-stage washing, subject to the unconfirmed possibility that "A" Line solvent may be initially very much more seriously contaminated than is "B" Line solvent. Overall solvent consumption amounted to 3.7 gallons of TBP, and 11.3 gallons of diluent per ton of uranium processed. Evaluation of activated carbon filter beds for cleaning up sump-contaminated solvent continued in 276-U Building with evidence of some quality improvement attained by processing about 30 pounds of solvent for each pound of activated carbon in a two-foot diameter by six-foot long filter bed comprised of "Pittsburgh" (20/50 mesh) activated carbon.

#### Equipment

The failed 17-8 ("B" Line RA Column) pulser was reassembled, after replacement of worn parts and improvement of the lubrication system, and shown to be satisfactory by a test run-in.

The 19-8 ("A" Line RA Column) to 19-6 (RAF Tank) vent, with jumper removed, was tested under simulated five-ton per day run conditions which indicated that overflow from the column to the feed tank through this line does occur. The RCF system was steamed to remove any precipitated materials which might interfere with free organic phase cascade flow, and the RA-RC system was reassembled. Additional operation, since September 12, 1954, has resulted in organic phase again appearing in the 19-6 (RAF) Tank. Since a check of as-built dimensions for the "A" and "B" Line RA Columns shows no difference between them, differences between the RC Column feed distributors and/or in vent system pressure-flow relationships may be indicated.

1215307

Process Chemistry

Feed-Solvent Contacts - The continuing presence of organic phase in the A-Line RAF (aqueous feed) tank has prompted an investigation of the effect of such feeds on RA Column performance. Synthetic "cold" RAF solutions which had been in contact with 0.2 volume of RAX at 105 C. for periods of 15 minutes and 10 hours were used in miniature pulse-column runs. Normal column operation was noted in both cases. However, the DBP (dibutyl phosphate) content of the RCU increased from a standard value of 30 parts /10<sup>6</sup> parts of U to 45 parts for the feed contacted with solvent for 15 minutes, and to 420 parts/10<sup>6</sup> parts of U in the case of the feed contacted with solvent for 10 hours.

DBP Formation in RCU - To determine the effect of complete de-entrainment of organic phase from RCU upon the DBP content of the uranium solution as a function of storage time, a TBP Plant sample of RCU (obtained during a period of foaming in calcination) was divided into three aliquots, treated as indicated below, and the DBP content was determined as a function of storage time at 50 C. One of the three aliquots was left untreated, as a control, and the other two were de-entrained of suspended organic drops by centrifugation, or by filtering through sintered stainless steel. Although the control sample contained entrained organic phase, there was essentially no difference among the three aliquots in the rate of DBP formation, indicating the dissolved TBP to be primarily responsible for the DBP build-up in RCU.

Antifoam Agent for 224-U Building Operation - The minimum amount of Dow-Corning Antifoam AF Emulsion required to prevent foaming during laboratory concentration and calcination of DBP-spiked (100 to 200 parts/10<sup>6</sup> parts U) synthetic C-1 (60 per cent UNH) solution was determined to be about 25 parts of antifoam/10<sup>6</sup> parts of uranium. Plant experience has shown that this agent is sufficiently stable that only one addition need be made to a pot charge during calcination. No adverse effect on reactivity was noted as a result of the addition of 50 parts of this antifoam/10<sup>6</sup> parts of U, and resulting silicon contamination is negligible.

URANIUM CONVERSION PROCESS TECHNOLOGY

An average production rate of 79 per cent of design capacity, for electric pots only, was sustained during the report period. No calcinations were carried out in the eight-foot diameter gas fired pots but Pot No. 20 is ready for test runs, at the time of reporting, while Pot No. 19, which failed earlier, is scheduled for replacement. The primary reason for operation at below design capacity was lack of feed. Foaming continued to be an intermittent problem but resulted, in combination with reduced processing rates experienced during the production of sulfamic acid-spiked UO<sub>3</sub>, in an overall average time cycle of 7.6 hours vice the 8.0 hours design basis value. Of the uranium calcined 68 per cent was from TBP processing of Tank Farm feed, 18.6 per cent was from TBP processing of Redox UNH, and 13.4 per cent was from Redox processing. Total metallic impurities, fission product gamma activity, and plutonium in product UO<sub>3</sub> averaged 146 parts per million parts of uranium, 72 per cent of aged natural uranium gamma, and less than five parts per billion parts of uranium. Two shipments were made at 154, and 130 per cent of aged natural uranium gamma, as determined by the HAPO method. Routine steam stripping and uranium concentration operations were carried out during the month. Acid recovery operations led to the recovery of ca. 995 pounds of nitric acid, containing about 0.8 per cent of the uranium calcined, in ca. 40 weight per cent nitric acid solution, for each ton of uranium calcined.

1215308

**DECLASSIFIED**Absorber Test

Testing of the feasibility of attainment of an ultimate target of production of 53 weight per cent nitric acid by T-A-1 (absorber) operation alone was initiated on August 31, 1954, with the operation of a continuous purge for the removal of chloride ion. Successful operation in this way would permit production of the acid without the requirement for a vacuum fractionator. It would, however, require either disposal or alternate processing or use of 60 to 100 per cent UNH evaporator overheads (ca. 2.5 weight per cent nitric acid containing evaporator uranium entrainment losses). Initial data show that (1) 53 per cent acid may be produced, with UNH concentration in pot feeds at or very near to 100 per cent, and (2) continuous purging of chloride ion at about 20 to 30 per cent of the reflux rate permits steadier overall absorber operation and permissible chloride build-up. It is next planned to introduce the Cooler acid, about 48 weight per cent nitric acid, at several selected plates, and to evaluate overall performance under these conditions.

Powder Reactivity Improvement Test

Two carloads of  $UO_3$ , processed with 0.05 weight per cent sulfamic acid added, were produced with reactivity ratios to standard of 1.14, and 1.09. Comparable values, without the use of additives, averaged about 0.98. At the end of the report period alternate carloads include 0.05 and 0.03 weight per cent sulfamic acid additive for shipment to Paducah and Oak Ridge, respectively.

RCU Filtration Test

Four tests employing the RCU filtration stand between the X-2 and X-1 storage tanks have been completed. The filter employs an "F" porosity Micrometallic filter element. The average fission product arithmetic D.F. observed was 1.4 (ca. 30 per cent removal of activity). Increased pressure drop across the filter and activity build-up at the filter station during tests show that solids are being removed from RCU. Inconsistent results have been attained for DBP removal by filtration. Other filter media, particularly filter cloths, are to be tested.

Agitator Torque Test

Calcinations carried out in electric pots, using 25 and 20 revolution per minute agitator drives, continue to show that higher torque prevents agitator stalling even when up to 0.08 weight per cent sulfamic acid additive is employed. On the other hand, heating time cycles were increased 12 and 28 per cent by changing from 37.5 to 25 and 20 revolutions per minute in Pots 13 and 8, respectively. Some eruptions of cooling  $UO_3$  have occurred, resulting in blowing oxides of nitrogen and powder into the pot room, with these eruptions being most frequent from Pot No. 8 which is equipped with the slowest agitator. No definite correlation of eruptions with agitator speed has been found, however, nor have such eruptions been confined exclusively to pots having slow agitators, long time cycles, or containing sulfamic acid as additive.

Antifoam Agent Test

Dow-Corning AF Emulsion, at values as low as 2.4 grams of emulsion per 500 pounds of uranium continues to give excellent foam inhibition at T-C-1 settings of 400 C.

1215309

IN-LINE INSTRUMENTATION

The Redox 2DU gamma monitor was placed in service on September 23. High and low activities recorded by the apparatus were confirmed by laboratory analyses of samples taken during the respective periods. The substitution of a Dri-Filmed Pyrex-glass sample cell for the original aqueous-wetted cell resulted in substantial and prolonged reduction in residual background activity.

Operation of the pH meters, which sample the TBP Plant pooled waste, has been far from satisfactory during the report period. The major causes of difficulty have been (1) sampler plugging, (2) unauthorized adjustments of instruments, (3) servicing problems and (4) changes in servicing techniques. A pH sensing unit of improved design was installed at the TBP Plant late in the report period. The new modification promises to be less sensitive to variations in servicing techniques; it utilizes a stainless steel sampling chamber, instead of glass as in the past. The unit also features a replaceable dip-stick electrode and salt-bridge assembly and elimination of the ground-wire connection.

BISMUTH PHOSPHATE PROCESS TECHNOLOGYFirst Cycle Waste Scavenging

Production test 221-T-18, "Scavenging of First Cycle Waste", was issued. The actual test will commence approximately October 6. This starting date is dependent upon the pH meter installation in the 15-8 tank sampler lines.

The feasibility of separating first cycle waste and coating waste was established by using the 15-7 tank as a receiver for the coating waste and 15-8 tank for the first cycle waste receiver. A total of four new cell jumpers and two new diversion box jumpers would be necessary.

New Equipment

A new silver reactor was installed on 4-5L dissolver system on September 25. This was necessitated by the apparent "plugging" of the old reactor. A written procedure for the coating of the berl saddles was furnished. A training program was also established to acquaint Separations Section personnel with the proper procedure of coating the saddles.

Z PLANT PROCESS TECHNOLOGY (ISOLATION, PURIFICATION AND FABRICATION)Isolation Building (Task I)

A free swinging Teflon scraper has been installed at the end of the agitator shaft in the P-1 precipitator tank, cell 2, to improve slurry transfers and minimize product hold-up in the tank. Tests made in mock-up equipment showed that with the addition of this device, slurry motion is maintained throughout the filtration step. The benefit with the scraper arises from the fact that the slurry is then agitated throughout the entire transfer step, whereas with the propeller only, agitation is not accomplished when the slurry volume is less than about five liters.

**DECLASSIFIED**  
**WITH DELETIONS**

EW-33200

DEL

A 15 micron porous Kel-F filter has been successfully used to filter F-10-F peroxide slurries for one month. Filtration time has ranged from 15 to 30 minutes for slurries and from two to ten minutes for washes. This filter media plugged when it was tested on Redox product solution oxalate slurries.

Hydrofluorination (Task II)

Based upon the color of fluoride powders, 25.2 per cent of the runs entering Task II required rehydrofluorination. This compares to 3.6 and 25.7 per cent rehydrofluorinations for July and August, respectively. The pink powders produced during September was 29 per cent of the total as compared to 25 and 32.4 per cent in July and August, respectively. Double batches accounted for 77 per cent of the runs processed.

Reduction (Task III)

The plutonium from the reduction of plutonium fluoride powders in Task III averaged 98.6 per cent. The average yields for July and August were 98.2 and 98.7 per cent, respectively. Low yields obtained from six runs are included in this month's average.

1215311

**DECLASSIFIED  
WITH DELETIONS**

Process Specifications

The isolation, purification and fabrication plant process specifications, HW-31967, were issued during this report period. They are currently being revised to bring them up to date.

### Plutonium Metal Reactivity

In further investigation of the formation of excessively reactive plutonium metal in the metal reduction step, calcium hydride was added to three reduction charges (0.5 to 1.0 gram  $\text{CaH}_2$  per 30 gram reduction). The buttons had small inclusions of abnormally reactive material but were much less reactive than the metal formed in the presence of water. These results suggest that the reactive material is something other than plutonium hydride.

### Recuplex Development

Laboratory studies of the rate of reduction of plutonium(VI) by hydrogen peroxide, in various Recuplex feed solutions, have shown that at room temperature, the destruction of excess hydrogen peroxide and the re-oxidation of plutonium (III) are the slow steps in the preparation of the solution for solvent extraction. Concentrations of 0.5 M  $\text{H}_2\text{O}_2$  and at least 6 M  $\text{NO}_3^-$  are necessary for attainment of 100 per cent plutonium(IV) in one hour. For rapid and complete destruction of residual peroxide, a plutonium concentration of at least 20 g/l, or the addition of up to 6 g/l  $\text{Fe}^{+3}$ , is necessary.

Equilibrium data from a batch, counter-current, solvent extraction run using 20 per cent TBP and a Recuplex Flowsheet suitable for the purification of F-10-P, agree well with the values predicted for 20 per cent TBP from relationships previously established for 15 per cent TBP.

The use of 15 per cent TBP in Recuplex will allow a maximum plutonium concentration of ca. 70 g/l. This value was determined by contacting a sample of 15 per cent TBP- $\text{CCl}_4$  with four equal volumes of an aqueous solution containing 199 g/l Pu, 1 M  $\text{Al}(\text{NO}_3)_3$ , and 3.25 M  $\text{HNO}_3$ .

### Materials of Construction

From preliminary measurements of corrosion rates of Haynes 25 alloy (50 per cent Co; 20 per cent Cr; 10 per cent Ni; 15 per cent W; traces of other metals), the use of the alloy appears promising for the construction of replacement slag-and-crucible dissolvers or of other vessels which will hold hot, hydrofluoric-nitric acid solutions. The following corrosion rate measurements (for the over-all, slag-and-crucible dissolution cycle) were obtained: 1) plate (as received), 1.65 - 2.02 mils per month; 2) weld metal, 2.93 mils per month; and 3) 309 SCB stainless steel coupon, 7.1 mils per month.

Measurements of the corrosion rate of the stainless, spring metal, Elgilloy (Co 40, Cr 20, Ni 15, Mo 7, Mn 2.0, Be 0.04, C 0.15, Fe balance), in Task II type hood atmospheres indicate that the material should be satisfactory for Task II service.

### RECUPLEX CONSTRUCTION

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 72 per cent completed. Installation of the process hood framework has commenced.

1215313

Fc-17

DECLASSIFIED  
WITH DELETIONS

DECLASSIFIED

ANALYTICAL LABORATORIES

General Chemical Laboratory - A significant number of samples containing dibutyl phosphate (DBP) were analyzed to verify the concentration limits and precision to be reported by this laboratory when employing the "Disengaging Time" method. For organic solutions (30 per cent TBP in Shell Spray Base) the lower limit is 10 mg DBP/L. For aqueous solutions the lower limit is 1 mg DBP/L. The upper limit for both mediums is the maximum solubility. The precision within the indicated limits is  $\pm 20$  per cent.

Apparatus has been put in operation to permit the determination of the water content of salts, particularly for double fluoride salts containing uranium.

Radiochemical Laboratory - Over half the analytical work associated with the determination of "burn out" in 13 SS clad fuel specimens from the Aircraft Nuclear Propulsion Project, has been completed. To facilitate the determination of total uranium, the samples were freed of iron through use of the mercury cathode.

The Gamma Spectrometer offers a convenient method for the detection of as little as 1 per cent Am-241 alpha activity in the presence of 99 per cent Pu-239 alpha activity. The alpha/gamma ratio of Am-241 is 2 while this ratio for Pu-239 is 1000. This principle is useful in determining the Pu assay method to be employed on samples of questionable Am content.

Using the slow scanning speed of the new Gamma Spectrometer overnight scans are possible to produce reliable data on samples as low as 1 C/M/ML.

Spectrochemical Laboratory - Test operation of an arc-spark source enclosure for radioactive samples was attempted. First tests proved the electrical insulation to be insufficient. This was corrected and the metal air seal lines then produced arcing and were replaced with lucite tubing. Under high frequency sparking occasional current leakage is now experienced. The source of this leakage is being sought for correction.

Mass Spectrometer Laboratory - Work is continuing on liquid tributyl phosphate (TBP) samples. Diethyl butyl phosphate and triethyl phosphate were scanned to attempt to establish a trend for the cracking of TBP. Various sample bulbs and sampling techniques have been employed to produce the best spectrum.

Responsibility for the operation of the Consolidated Mass Spectrometer in the 300 Area and the determination of isotopic content of uranium samples has been accepted from the Chemistry Unit. To date results have been too erratic to be reported, however, some progress is being made.

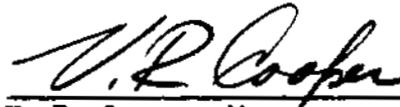
Water Quality Laboratory - The new colorimetric iron procedure employing the reagent Bathophenanthroline, while extremely sensitive, appears to have limitations for 100 Area water due to the nature of the iron in process water. It is probable that the iron is suspended rather than ionic. Work will continue on the method.

Work volume statistics for the Analytical Laboratories are as follows:

	<u>August</u>		<u>September</u>	
	<u>Number of Samples</u>	<u>Number of Det'ns.</u>	<u>Number of Samples</u>	<u>Number of Det'ns.</u>
<u>Research &amp; Development</u>				
Applied Research	1193	4212	893	2162
File Technology	169	445	265	1380
Fuel Technology	47	599	40	456
Separations Technology	673	1078	934	1189
<u>Process Assistance</u>	291	2092	72	334
<u>Other Customers</u>	<u>130</u>	<u>732</u>	<u>91</u>	<u>277</u>
Total	2503	9158	2295	5798

INVENTIONS

J. S. Buckingham - "The use of Sulfur and its Compounds for the Improvement of the Reactivity of  $UO_3$ ."



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

October 11, 1954

VRC:md

DECLASSIFIED

**DECLASSIFIED**

APPLIED RESEARCH SUB-SECTION  
MONTHLY REPORT - SEPTEMBER 1954

Applied Research Sub-Section

VISITORS AND BUSINESS TRIPS

T.J.E. Glasson and G. E. Martin, KAPL, visited Hanford September 1-3 to discuss radiometallurgy facilities.

Alvin Radkowsky, Reactor Development Division, Naval Reactor Branch, Washington, D.C., visited Hanford September 16-17 to discuss reactor physics.

G. J. Alkire spent September 7-10 at KAPL and the General Engineering Laboratory, Schenectady, discussing mass spectrometric applications and problems.

H. T. Hahn, M. C. Lambert, and R. L. Moore presented papers at the National American Chemical Society Meeting, September 12-17, in New York City.

R. L. Moore visited KAPL September 20-21 to discuss process chemistry and visited the Commercial Solvents Corp., Terre Haute, Ind., September 22, to discuss solvent quality problems.

R. H. Moore spent September 14-15 at the University of California Radiation Laboratory, Berkeley, California, consulting on irradiation damage problems and September 20-21 at Shell Oil Co., San Francisco, California, discussing the chemical composition and reactivity of Shell Spray Base total nitric acid oxidation.

L. A. Hartcorn spent September 15-16 at the Battelle Memorial Institute, Columbus, Ohio, attending a meeting of Cooperative Uranium Metallography Program members.

M. B. Leboeuf visited KAPL September 27-28 to discuss Hot Semi-Works in-line monitoring.

ORGANIZATION AND PERSONNEL

Personnel totals as of September 30 were as follows:

	<u>Exempt</u>	<u>Technical Graduates</u>		<u>Non-Exempt</u>	<u>Total</u>
		<u>Permanent</u>	<u>Rotational</u>		
Physics Unit	24	1	0	7	32
Metallurgy Unit	43	0	2	25	70
Chemistry Unit	48	1	1	15	65
Administration	<u>1</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>5</u>
Total	116	2	3	51	172

DECLASSIFIED

**DECLASSIFIED**

Applied Research Sub-Section

PHYSICSLattice Physics

The properties of a lattice of 0.9 inch diameter, cored, enriched uranium (0.8% U-235) slugs on a 4.5 inch spacing were determined by extrapolation of exponential experiment data on 0.925 inch natural uranium slugs. The results are given in the table below:

	<u>f</u>	<u>p</u>	<u>k</u>	<u>L<sup>2</sup> · T</u>	<u>Buckling</u>
wet	0.888	0.871	1.070	498 cm <sup>2</sup>	141 x 10 <sup>-6</sup> cm <sup>-2</sup>
dry	0.952	0.794	1.043	475 cm <sup>2</sup>	90 x 10 <sup>-6</sup> cm <sup>-2</sup>

These values refer to cold, clean conditions. It will be seen that the loss of water leads to a loss of reactivity of 51 x 10<sup>-6</sup> cm<sup>-2</sup> or about 1000 in-hours, thus this is a so-called "safe" design.

The temperature coefficient of this lattice has also been calculated. The change in reactivity of a reactor as its temperature is raised is the accumulated result of several effects. For convenience, these may be grouped as follows:

$\left(\frac{\Delta k}{k}\right)_1$  = change in thermal utilization caused by change in average energy of the neutrons.

$\left(\frac{\Delta k}{k}\right)_2$  = change in number of neutrons produced per thermal neutron absorbed caused by changes in the ratios of the uranium cross-sections as the average neutron energy is changed.

$\left(\frac{\Delta k}{k}\right)_3$  = change in fraction of neutrons leaking out of the pile.

$\left(\frac{\Delta k}{k}\right)_4$  = change in resonance escape probability caused by increased absorption in uranium-238 in the resonance energy region.

The first three terms depend on the increased average energy of the thermal neutrons and, since this increase is largely determined by the temperature of the moderator, their sum is usually called the graphite coefficient. The last term depends only on the temperature of the <sup>238</sup>U atoms and is therefore called the uranium or metal coefficient.

The values obtained are given in the table below:

## Applied Research Sub-Section

	<u>wet pile</u>	<u>dry pile</u>
$(\frac{\Delta k}{k})_1$	$7.65 \times 10^{-5}/^{\circ}\text{C}$	$0.65 \times 10^{-5}/^{\circ}\text{C}$
$(\frac{\Delta k}{k})_2$	$-8.8 \times 10^{-5}/^{\circ}\text{C}$	$-8.8 \times 10^{-5}/^{\circ}\text{C}$
$(\frac{\Delta k}{k})_3$	$-2.4 \times 10^{-5}/^{\circ}\text{C}$	$-1.1 \times 10^{-5}/^{\circ}\text{C}$
Sum of 3 terms (graphite coefficient)	$-3.6 \times 10^{-5}/^{\circ}\text{C}$	$-9.3 \times 10^{-5}/^{\circ}\text{C}$
$(\frac{\Delta k}{k})_4$ (metal coefficient)	$-1.8 \times 10^{-5}/^{\circ}\text{C}$	$-3.0 \times 10^{-5}/^{\circ}\text{C}$
Total temperature coefficient	$-5.4 \times 10^{-5}/^{\circ}\text{C}$	$-12.3 \times 10^{-5}/^{\circ}\text{C}$

Since it is difficult to estimate the amount of uncertainty in the various quantities used in the calculations, these numbers are to be used with some reserve. It will be seen that the loss of reactivity due to loss of water increases with temperature in this lattice. Thus, if the reactor is "safe" at zero power, it is "safe" a fortiori at high operating power.

The results described above apply to the hypothetical reactor of the specifications given and, further, to the behavior of this reactor with unexposed uranium only.

Some results have recently been obtained which apply to the changes in temperature coefficients which occur as the exposure of the uranium progresses. These results refer to present Hanford reactors of the H-type.

It was seen that a large contributor to the graphite coefficient is represented in the term  $(\frac{\Delta k}{k})_2$ , the change in the number of neutrons produced per thermal neutron absorbed in uranium caused by changes in the ratios of the uranium cross-sections with change of average neutron energy. Now as irradiation of metal progresses, plutonium is formed in increasing amounts. Its cross-section depends on neutron energy in a different way than do the uranium cross-sections. It is thus to be expected that the contribution of the term  $(\frac{\Delta k}{k})_2$  will change as the plutonium concentration (and, thereby, exposure) increases. Calculations relating to this type of change have been made. What is calculated here is the magnitude of the change of reactivity per unit of exposure for different temperatures. An example of these results is the following: at 300 K, a wet Hanford pile gains about 1.5 in-hours per MWD/T of exposure; at 700 K it will gain about 4.6 in-hours per MWD/T of exposure. The magnitude of these reactivity changes shows that pile operation is seriously dependent on these effects, thus considerable further study is required. These calculations are reported in some detail in document HW-32933.

Some recent experiments in a J-slug lattice have shown that the neutron flux exhibits an asymmetry in the direction of an exponential pile in which the flux is decreasing exponentially. In order to see whether or not the asymmetry could affect measurements of the buckling, the buckling of the 10 3/8 inch lattice of 1.66" slugs was

**DECLASSIFIED**

HW-33206 JEL

Applied Research Sub-Section

measured five times; each time a different position of the cell being utilized. The results of the five measurements range from 118.6 to 120.8. Since the uncertainty in these is  $\pm 1$ , we conclude that the observed asymmetry does not affect measured buckling values.

However, it is possible that the asymmetry could affect the determination of the thermal utilization. For this reason a complete cell traverse is being made in the standard lattice.

An off-site experiment<sup>(1)</sup> has been done to determine the effective absorption cross-section of thorium fabricated into a Hanford type slug. The value obtained, 9 barns; can be used to calculate the resonance escape probability,  $p$ , for such a slug since it includes resonance as well as thermal absorption. The calculation has been made and yields the value 0.91 for  $p$ . This is in good agreement with the following values obtained by other methods: 0.927 from a single column experiment, 0.90 from a measurement of the effective resonance integral and 0.91 from a Test Pile experiment.

A new fuel element, composed of lead and uranium oxide, has been designed for the Lattice Test Reactor. This design has the virtue that, in the case of the worst possible conditions of reactor runaway, the total energy release is confined to about  $2 \times 10^7$  watt-seconds. The pressure in the reactor room would then rise only by 0.4 atmosphere, and there is thus a good chance that all contamination by fission products would be restricted to reactor building. Although the advantages of the new fuel elements are not expected to ever be realized, their use does lead to a safer reactor.

Nuclear Physics

In connection with the use of thorium to produce U-233 in Hanford reactors, it is of interest to measure directly the effective Th-232 absorption cross-section in the Hanford flux. An experiment to do this has been designed. A sample of thorium, chemically separated from its daughters, would be exposed along with an appropriate flux monitor in a Hanford pile for about 10 seconds. After removal, it is found that about four hours are available to count the resulting Th-233 before sufficient Pa-233 is formed to mask the desired results. The possibility of this measurement rests on the facts that Th-233 emits only  $\beta$ -particles and that total or  $4\pi$  counting of these is experimentally feasible.

At one stage of the experiment to measure the Np-239 cross-section, the neptunium sample will be analyzed for Np-240 by counting the seven-minute activity of Np-240 with a  $\gamma$ -ray scintillation spectrometer. It was planned to do this in a lead cave with five-inch walls at a location about five feet from the pile face. An experiment was done to measure the background count at this location in a mocked-up cave. The background turned out to be of the same order as the expected counting rate from Np-240, assuming a cross-section of 50 barns for Np-239. Provision is therefore being made to relocate the apparatus.

(1) Reported in TID-2010, p. 108 et seq.

## Applied Research Sub-Section

Physics Problems Connected with Plant Operation

Samples of two liquid fluorochemicals, named N-43 and O-75, have been obtained and tested in 305 Pile for suitability in a possible experiment to measure the reactivity effect in a (thermally) hot reactor of cooling water loss. The hot reactor would be shut down and one of these liquids would be substituted for water in one or more process tubes. The reactivity change would then be measured. The relative reactivity effects of water and the fluorochemical are measured beforehand in the 305 Pile. These measurements have already been done and show that both N-43 and O-75 have about 35% of the reactivity effect that water has. From these measurements the effect of water loss on an operating pile could be determined.

A report, HW-33073, has been issued giving a treatment of the xenon problem of sufficient generality to permit changes in slug and pile design. Such changes are dealt with by adjusting parameters in the xenon equation. In this way, the tables being prepared for the 100-K reactors can be used generally for graphite piles. This work thus makes it unnecessary to recompute an extensive new set of tables for each type of reactor.

One of the problems encountered in controlling the Hanford reactors is that of detecting the very low neutron flux in a subcritical reactor. One method to solve the problem is to simply raise this flux by the introduction of a source. A possible source is the photoneutron process on beryllium. Measurements of the strength of this source have been made by exposing beryllium nitrate solutions to the  $\gamma$ -rays from irradiated slugs. These measurements show, for example, that the flux in a Hanford pile can be raised by a factor of 100 with the use of 87 kg of beryllium at 30 hours after shut-down. A more detailed report of this work is given in document HW-32874.

A report, HW-32600, was written in which estimates are made of the amounts of low g/t plutonium that could be produced by segregating the slugs which had been located in the ends of the process tubes during irradiation. Such segregation could yield significant amounts of low g/t plutonium.

CHEMISTRYPurex

Two Purex study flowsheets have been drawn up with the objective of maximizing the uranium processing capacity of the "existing" Purex plant employing a hydrocarbon diluent. The first of these flowsheets, HC#1, employs three cycles for both uranium and plutonium and attains an estimated instantaneous processing rate of 25 tons uranium per day by replacement (or perhaps redesign of cartridges) of the HA, LA, LB extraction, and 2D columns. Construction of additional dissolver and feed make-up facilities and replacement of the condensers on the intercycle concentrators should permit instantaneous processing rates in excess of 30 tons uranium per day.

Study flowsheet HC#2 employs only two cycles for both uranium and plutonium, thus permitting parallel operation of existing equipment at critical points. It is presumed that the additional decontamination necessary to meet product specifications in two cycles can be obtained by operating the uranium "A" type columns and the 2A column at 50-60 C, or by operating a reflux plutonium cycle as the second plutonium cycle. A tail-end silica gel adsorption step may be necessary to assure adequate

**DECLASSIFIED**

HW-33200

DEL

Applied Research Sub-Section

decontamination of uranium from zirconium with this flowsheet. An estimated processing rate of 25 tons uranium per day could be obtained with replacement of only the 2D and 1B extraction columns. Processing rates greater than 30 tons uranium per day would again require construction of additional dissolver and feed make-up facilities and replacement of the condensers on the 2EU.

To determine whether irradiation damage to solvent containing carbon tetrachloride diluent would lead to emulsion formation or lowered flooding capacities in Purex "A" columns, two-phase mixtures of 30 percent TEP in carbon tetrachloride with synthetic HAPS were irradiated up to  $10^6$  R, and then subjected to dispersion and coalescence tests. The results indicated no emulsion formation or decreased flooding capacity due to irradiation. Similar results were obtained with Shell Spray Base diluent -- a typical hydrocarbon diluent.

Thorex

Zirconium phosphate and manganese dioxide continue to show promise as scavenging agents for the removal of protactinium from Thorex feed solution. Carrier precipitation of greater than 95 percent of electrochemically prepared tracer protactinium has been obtained from solutions of various thorium, fluoride, and nitric acid concentrations. However, results have been somewhat erratic and will be checked using tracer and full level solutions prepared by standard fluoride-catalyzed dissolution.

Increasing the thorium concentration in the organic phase has been shown to back-salt protactinium into the aqueous phase, thus improving decontamination from protactinium. For example, increasing the organic phase thorium concentration from 0.3 M to 0.6 M decreases the protactinium distribution coefficient from 1.3 to 0.2 in the system: 3 M  $HNO_3$ -45% TEP in carbon tetrachloride. Such near-saturation operation of a carbon tetrachloride diluent organic phase in a second thorium cycle is an attractive alternative to ORNL's acid deficient system for attaining protactinium decontamination in the 1A column.

Uranium Recovery

The effect of temperature on the entrainment of organic (dispersed) phase in RCU was investigated using a pulsed stirrer and anthracene as a tracer. The entrained organic 30 seconds after stirring was stopped appeared to be about one volume in 2000 at 25 C and this dropped by a factor of three or four in another three minutes. At 50 C the entrainment 30 seconds after stirring was about 50 to 80 percent as great as at 25 C. The difference disappears with time, and after five or six minutes of settling, no significant difference in entrainment was detected.

Of several adsorption columns tested for the removal of dissolved tributyl phosphate from RCU, silica gel was effective, but celite or alumina ineffective. Celite batch scavenging was likewise ineffective.

Tributoxyethyl phosphate has been identified at about the 0.2 percent level in raw TEP by chromatographic analysis of the bottoms from a vacuum distillation. The effect of this material on process operation has not been investigated, but no direct adverse effects would be expected.

### Applied Research Sub-Section

Air sparging of RCW was tried in order to separate any surface active material with the foam. Starting with two liters of material, 90 ml of foam was finally collected. Disengaging time measurements using synthetic RAW as the aqueous phase yielded an average disengaging time of 56 seconds for the foam sample and a disengaging time of 51 seconds for the heel from which the foam sample had been removed. This is not a sufficiently large increase in disengaging time to say with certainty that it is due to the foaming agent. The heel from the first separation could not be induced to foam, indicating complete removal of the foaming agent.

Further measurements of the distribution of dibutyl phosphate in RC systems has shown a wide variation dependent largely on its own concentration and on UNEH concentration. Thus, between water and 20 percent TEP-Shell Spray Base distribution values of 0.3 and 2.1 are found at the 50 and 5000 ppm level, whereas with an aqueous phase of RCU (0.25 M UNEH) values of 90 and 2000 are measured. Reflux will occur in the RC column, although most of the dibutyl phosphate escapes with the RCW.

An alternate analytical method has been developed for the determination of DEP, based on the photometric measurement of the turbidity produced by the Th(IV)-DEP compound. The method, which is intended for low level analyses of RCU solution, involves a preliminary isolation of DEP in a relatively pure form, and a concentration to ca. 20 mg/l, which is accomplished by a solvent extraction procedure. In the 1 mg/l range, recoveries have averaged about 70 percent. This method should permit an accurate determination of the hydrolysis rate of TEP in RCU solution.

### Ruthenium Studies

Slightly improved ruthenium decontamination of product uranium oxide has been achieved by sparging with ozone during calcination of unheadended concentrated LCU. Simulating the plant heating cycle (to 460 C in one hour, at 460 C for one hour), an average ruthenium decontamination factor of 30 was obtained using a 2 wt percent ozone sparge as compared to a factor of 9 with an air sparge (4 runs in each case). In addition, the radio-ruthenium volatilized moved further downstream in the calcination-absorption train in the presence of ozone. Modifications of the heating cycle will be tested, emphasizing the low temperature region where ruthenium tetroxide is relatively stable.

Volatilization of ruthenium during nitric acid recovery from Purex aqueous wastes could lead to objectionable contamination of the product acid and process equipment. Since the reported off-site experience is somewhat conflicting, an investigation has been initiated to establish under what conditions such volatilization may occur and what preventive measures to take. In this connection, a ruthenium compound which distills with nitric acid from a concentrated acid solution has been prepared by digestion of inactive  $K_4Ru(NO_2)_6$  with the concentrated acid for 24 hours. Only a fraction of the ruthenium distills, and this as a light yellow solution turning slowly to a deep purple, neither color bearing any spectrophotometric resemblance to ruthenium tetroxide. Efforts will be continued to characterize this volatile ruthenium species and to determine kinetics of its formation as a function of nitric acid concentration.

### Waste Treatment

A nickel ferrocyanide method has been developed, reported, and scheduled for plant test for coscavenging Bismuth Phosphate first cycle and coating removal waste, CRW. Since separate treatment of the CRW will be required for Purex and minimizes stored waste

1215323

Fd-8

**DECLASSIFIED**

**DECLASSIFIED**

HW-33200

DEL

Applied Research Sub-Section

volumes even with Bismuth Phosphate, scavenging of cesium from the supernatant solution above this high-salt, alkaline waste has been investigated. Of the various preformed adsorbents tried, at 40 g/l, Attaclay gave the highest cesium decontamination factor, viz. 19, resulting in a residual cesium concentration of 0.06 uc/ml, tentatively cribbable pending soil science study. Cost estimates would include 0.4 cents/gallon for the Attaclay and a volume ratio, settled scavenger to waste solution, of 0.24. It should be noted that a sample of Hanford soil (< 325 mesh, from a test well in 200-E) gave a cesium DF of 3.4 with a settled volume of but five percent, using the same 40 g/l concentration. At the same volume ratio, a DF comparable to that attained with Attaclay is suggested.

Samples of Bismuth Phosphate first cycle and CRW, as well as low and high salt Uranium Recovery-type wastes have been synthesized for soil science study by Radiological Sciences.

The effect of high radiation intensity on the scavenging of cesium from Uranium Recovery RAW is under investigation in anticipation of processing fresh material from T and B plants during the 4X program. Pending completion of a Sr-Y<sup>90</sup> beta radiation source, preliminary tests were made at the 100-F basin in a 10<sup>5</sup> R/hr gamma field. The cesium decontamination factors observed in two separate synthetic scavenged RAW slurries were 1000 and 250 after 7 days and 14 days, respectively. These values bracket the 750 observed for an unirradiated control standing for 7 days, and, more important, the 500 value desired for cribbing.

Isotope Separations

Uranyl ion and water transference data needed for the design of a hundred stage electrolysis cell to be used to test the separation of uranium isotopes by electrolysis through ion exchange resin membranes have been obtained. The data show that current efficiencies for the transport of uranyl ion in a nitrate system are over 70 percent of the theoretical, and that water transport through the membrane is a negligible design problem. The high efficiency observed, plus the fact that the pH of the solutions does not change appreciably during the electrolysis indicates that transport of hydrogen ion is small compared to the transport of the uranium. These results simplify the design problem by making control of the reflux flow a linear function of the current.

"Flurex" Process

A trial run was made on a modification of the Flurex Process (direct conversion of solutions of uranyl nitrate to uranic fluoride by electrolytic separation and reduction of uranyl ion in a special electrolysis cell). The original process called for the addition of ammonium fluoride to form the anhydrous double salt  $NH_4F \cdot UF_4$ ; the single salt contains water of crystallization which is difficult to remove and is undesirable. By substituting potassium fluoride for the ammonium fluoride, it is possible to retain the advantages of obtaining an anhydrous precipitate while also obtaining a product that need not have volatile matter ( $NH_4F$ ) driven off prior to a bomb reduction. The product obtained from the trial run with potassium fluoride was composed of dense crystals which were easily filtered and washed. Sufficient material was obtained to make a bomb reduction test in the near future.

## Applied Research Sub-Section

Analytical Development

Research was carried out during the month on the use of the porous cup source in emission spectrography of liquid samples. After exploratory work on the Medium Hilger spectrograph, the investigation was carried out on the Jaco instrument because of the higher resolution and therefore lower background intensities obtainable with the latter instrument. The study, which included the same 20 elements studied last month in the flame spectra work, showed that usable sensitivities are possible for all but cesium of the elements studied. Detection limits ranged from ten parts per million in water for arsenic, cerium, potassium, lead, and zinc to less than 0.001 parts per million for calcium and magnesium. For pile or process water samples, calcium, magnesium, sodium, potassium, and lithium could be determined on one sample as received. The remainder of the elements could be determined on a single sample after a 1000-fold reduction in volume, assuming present concentration levels of the ions. In the case of aluminum, copper, and iron, detection limits were 0.5 parts per million with precisions of 20%, 13%, and 6%, respectively. Current pile water levels for these ions is about 0.005 parts per million. For a water control laboratory, the porous cup spectrographic method can offer considerably faster analyses in cases where at least several constituents are desired, but the investment in equipment would be rather high. The method at present may be developed for service work which would permit the samples to be taken to a 300 Area spectrographic laboratory.

The plutonium-240 content of three samples of AT solution made from a special push of 200 MWD/T metal was determined using the fission counter. The determination was made to resolve a conflict in the value found by the neutron count and by the determination of specific activity. The fission counter results agree closely with the value from the neutron count which indicates that the specific activity determination was faulty. The neutron and fission counts indicate a concentration of Pu-240 that is larger than was expected from the irradiation data, as based on previous data. The fission counting data are being rerun to obtain a higher precision in the determination in order to determine the magnitude of this increase.

Although the direct, or nonseparative, procedure for the coulometric determination of microgram amounts of plutonium in the presence of large amounts of uranium gives results with a satisfactory precision, it was felt that the procedure is too touchy with respect to the amount of nitric acid that must be present to overcome the interference shown by uranium in the pretreatment step. A study was made on the use of a procedure that separates the bulk of the uranium from the plutonium prior to the pretreatment. The separation is based on the coprecipitation of Pu(III) on lanthanum fluoride. The advantages of the separation procedure were found to be: 1) the precision of the results is better (about 1/5 that for the direct procedure), being approximately one percent for the standard deviation of a single value; and 2) the sample manipulation will be simpler for highly radioactive samples, such as dissolver solution. The method is sensitive enough to enable the chemical determination of the plutonium in ten microliter samples of current Hanford dissolver solutions; some titrations on such samples are planned for the coming month.

The research mass spectrometer, Consolidated Model 21-221, was converted to uranium isotopic analysis work and tested for reliability. The instrument is now being applied by the Analytical Laboratories Unit to analyses in support of the isotope

**DECLASSIFIED**

## Applied Research Sub-Section

enrichment program. In this conversion, a Nier type source rather than the previously used "Isatron" was installed, and the reports from Paducah of greater sensitivity of this source have been confirmed. The source also has a more linear pressure curve and about a three-fold lower memory factor.

During the month, several uranium slugs having a variety of isotopic compositions were obtained, and work was continued on the gamma counting method for U-235. With particular interest in isotopic concentrations near that of natural uranium, the direct U-235 gamma count method proved to be limited to a rather poor precision. Studies with a count ratio method are under way.

In cooperation with the Metal Preparation's Process Sub-Section, an accuracy and precision study was planned for the gamma photometric determination of uranium in C slugs. In addition to standard slug analyses and the determination of corrections for slug diameter variations to be completed by Technical, a study of the effect of slug density is also required. The latter problem arises because an extrusion process is now used in C slug fabrication and densities are higher than those of cast slugs. The program will include measurement of analytical and sampling precision and intra-rod variation.

Design and assistance activities included an alteration of the input RC circuit of the x-ray photometer to stabilize the photometer output, alterations to the spectrographic source enclosure for radioactive samples in order to increase electrical insulation, and revisions and shop liaison for the fabrication of components for the Hot Semi-Works in-line monitoring program.

Research on an analytical method for dibutyl phosphate (DBP) in the range one milligram per liter has yielded an extraction-concentration procedure for aqueous uranium solutions. This procedure yields a concentration of ten to one in two successive extractions and DBP can thereby be detected by the disengaging time method at a level of about 0.2 mg/L. A concentration factor of nearly 50:1 can be obtained by a more elaborate extraction sequence. Application of the extraction technique to organic samples is being attempted.

The standard sample program involved 115 determinations in 100, 200, and 300 Area service laboratories. These included test samples of process water for ten elements; of UO<sub>3</sub> for seven impurities, of uranium in RCU; of uranium, nitric acid, sodium and phosphate in a WR-004 sample; of aluminum in an ANN solution, and of uranium in an RAW sample. Results on the RCU, RAW, and ANN samples were particularly good.

In-Line Analysis

Fabrication, assembly, and testing of equipment for the Hot Semi-Works installation progressed significantly during the month. One of the master programmer switches was tested extensively and found adequate; the two remaining units are being assembled. Final models of gross gamma and gamma spectrometer consoles have proved to be satisfactory in the lab performance tests, and the gamma photometer console and sensing unit are complete except for a gamma source. A one-hour trial irradiation in C-pile of a specimen of thulium metal established that a ten-hour irradiation would be adequate for the present application in the Hot Semi-Works. The hard gamma from the tantalum impurity in this thulium mentioned last month proves to be tolerable

## Applied Research Sub-Section

in this application, but arrangements have been made to exchange a portion of our metal for pure thulium oxide from the Ames Laboratory. The use of samarium-145 for gamma photometry will not be tried at this time because of the scarcity and high cost of the required isotope.

The "alpha-printer" monitor designed by Instrument Development, Design Section, for the Hot Semi-Works is about 75% complete in fabrication. The final models of the pH console are being fabricated after some design modifications were made during the month.

The measurement of both uranium concentration and turbidity (aqueous entrainment) in organic stream samples has been studied and a dual photometer cell has been designed which will measure and record both values on the same sample. In the laboratory tests the turbidimeter can readily detect an entrainment of less than 0.1 percent aqueous phase in the organic stream. The unit is undergoing mechanical stability and precision tests on a mock-up stream. Meanwhile, circuitry modifications to the photometer console required by this sensing element change are being designed.

Development continues in an effort to design a foolproof sample flow line to the gamma monitor cells for the Hot Semi-Works. Tests on the jet sampler mock-up in the 231 Building showed that ball check valves, required to hold the sample in the cell after the jet is turned off, are not reliable, and replacement solenoid valves tested thus far have not been entirely satisfactory. Leakage and life tests with remote control valves is continuing.

Polarographic sensing units designed for the Hot Semi-Works streams are being tested on a continuous operating programmer and jet sampler mock-up in the laboratory. Modifications over previous Metal Recovery Plant models appear to be satisfactory and nitrite removal is efficient. The addition of tributyl phosphate-solvent to the synthetic waste samples in a near-emulsion condition creates an erratic response which must be overcome. A polarographic sensing unit has been installed again on a test basis on one of the Metal Recovery Plant RAW streams, and for about one week performance has been good. There is evidence that a low quality batch of mercury has been at least one source of trouble in the Metal Recovery Plant installation. At present, all mercury is being reprocessed in the laboratory before use to insure purity.

Development on a gold electrode polarographic unit is being directed toward elimination of a progressive decrease in hydrogen overvoltage of the electrode with usage. Mechanical or strong acid cleaning or several hours of soaking in water restore the electrode to its initial condition, but reproducible polarograms under continuous use can be obtained only for a few hours. A regeneration technique applicable to automatic, remote application is required for the in-line analysis program.

Activities related to Purex in-line monitoring included pH monitor cell and shield design work and on-site inspection of Purex facilities. The latter revealed that alterations made in the plant design after the in-line monitor shields and plumbing were designed will require a few alterations in the latter. The first gamma monitor shield and mechanical assembly has been received and tested and found to be adequate from a shielding standpoint, although a reduction of tolerances will be required on certain parts in the remaining units to be fabricated. Shielding is such that a detection level of about 1.7 microcuries per liter of gamma will be possible assuming a 30 milliliter cell.

1215327

Fd-12

DECLASSIFIED

**DECLASSIFIED**

HW-33200

UCL

#### Applied Research Sub-Section

An alpha sensitive scintillation screen of zinc sulfide in teflon latex was fabricated, and it shows promise of being usable in direct contact with liquid samples.

The gamma monitors on the RCU stream in the Metal Recovery Plant have functioned smoothly for several months and have proved to be particularly valuable in recent weeks. Process changes and off-standard conditions have been reflected quickly on the monitors, allowing decisions to be made before laboratory sample results could be made available.

#### Decontamination and Waste Disposal

The ten-foot gloved box and column in Room 1-F, 222-S Bldg., was removed to the burial ground. Gross plutonium contamination within these units precluded decontamination because of the hazard and expense involved.

Fifty thousand gallons of crib waste were transported from 300 Area to 200 West Area for disposal to crib. One million gallons of 300 Area "retention" level waste were processed to ground.

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

#### METALLURGY

##### Irradiation Effects

The x-ray diffraction study of small, thin specimens of uranium exposed for 1, 5, and 24 hours at a water temperature of 35 C and flux of  $1.3 \times 10^{13}$  nv is continuing. Specimens, when examined with the x-ray diffraction unit, did not display gross radiation damage, so a precise diffraction peak study will be necessary to determine the type and extent of induced damage. The specimen exposed for 12 days (previously reported as 14 days) did display line broadening and shifting as well as peak asymmetry indicative of crystalline deformation. Tentatively, these data indicate that there may be a threshold effect which is a function of integrated flux and fission product formation.

A program to evaluate the effect of neutron flux intensity, integrated neutron flux, irradiation temperature, testing temperature, and post-irradiation annealing on the mechanical and physical properties of thorium has been initiated. The thorium for this test has been made available and is in the shape of six-inch slugs; tests are now being conducted to determine the best method of fabrication, as it is desired to reduce the diameter to  $3/4$  inch to reduce the machining costs of the samples and to conserve material.

A Zircaloy-2 specimen exposed ex-pile in a CO<sub>2</sub> atmosphere at 650 C gained weight in 3 1/2 days equal to the amount gained by a similar specimen exposed in-pile (F-pile atmosphere) at 650 C for 13 days and 600 C for 13 days. Further tests, wherein the exact in-pile exposure temperature is known, are required before it can be stated that pile irradiation definitely retards the gas reaction.

## Applied Research Sub-Section

Metallurgical Techniques

In order to investigate the bonding and diffusion characteristics of uranium-aluminum and similar diffusion couples as a function of pile irradiation, laboratory experiments designed to provide basic information on the bonding tendencies of uranium with aluminum are presently being conducted. Several couples have been hot pressed in an inert atmosphere after previous cleaning of surface contaminants by cathodic vacuum etching. Specimens #6 and #7, pressed at 500 C and at a pressure of 11 tons/in<sup>2</sup> for a period of one minute yielded inconsistent results. #6 had diffused only at occasional spots with an associated penetration of 0.001 to 0.002", whereas #7 had diffused uniformly with a diffusion zone 0.006" thick. A hot press, evacuable die now being constructed should permit reproducibility by affording better temperature and pressure control and a far superior environment during pressing.

The #4 diffusion specimen described previously has been examined extensively. This specimen, pressed at 500 C and 10.6 tons/in<sup>2</sup> for a period of one minute yielded a diffusion zone 0.003" thick. A study of the cleavage interface through the diffusion zone revealed that the penetration of aluminum into the uranium was much less than the penetration of uranium into the aluminum. The uranium side of the diffusion zone consisted of a honey comb of holes which are actually hollow cones, the apices of which point to the aluminum side. These apices terminate at a thin uniform layer of large flat mounds composed of small platelets oriented nearly perpendicular to the cleavage surface and the original interface. This layer, about 0.001" thick and the adjoining network of cones, 0.002" deep was identified as UAl<sub>3</sub> by x-ray diffraction methods. No evidence for the presence of UAl<sub>2</sub> or UAl<sub>4</sub> has been found to date.

Specimen #5, pressed at 450 C and 10.6 tons/in<sup>2</sup> for a period of one minute revealed no diffusion when examined on a polished surface perpendicular to the diffusion interface. Examination of this interface after fracturing did reveal isolated regions in which some diffusion had occurred. The appearance of these regions closely resembles the surface depicted by specimen #4. D. W. Bareis at Brookhaven National Laboratory has also observed and reported the presence of cones after uranium-aluminum diffusion in BNL-38. More extensive description of these specimens will be contained in the July-September Quarterly Report. Two clamping assemblies for mechanically pressing and constraining diffusion specimens for in-pile studies have been fabricated, loading the assemblies with specimens and liquid NaK coolant awaits completion of the NaK canning facility.

Interest in the magnesium matrix fuel element has warranted studies on the diffusional behavior of magnesium couples. A number of magnesium specimens are therefore being fabricated and prepared for hot pressing experiments.

The examination and photography of cathodically, vacuum etched specimens by optical and electron microscope techniques has continued to obtain background information on the microstructure of non-irradiated uranium and slug components. Projection slides depicting the techniques used and some of the microstructures observed have been prepared for use during presentation of a paper entitled, "Observations on the Microstructure of Uranium," at Battelle Memorial Institute, October 27, 1954.

**DECLASSIFIED**

#### Applied Research Sub-Section

A preliminary study has been made of the feasibility of utilizing the natural radioactivity of a canned uranium slug to detect a variation in can wall thickness or, in the specific case of cold canned slugs, to detect the eccentricity of the aluminum jacket. Results to date are encouraging, but since they are in contradiction to negative results obtained in a similar study by Applied Research in 1952, no conclusions are warranted at this time.

#### Fuel Element Studies

During the month two insulated slugs were fabricated using a point closure technique specially prepared and a 0.003" anodized layer on the interior surface. Excessive fragmentation of the insulating layer during cold working of the can had been feared. Additional cans and slug components are being machined to fabricate insulated slugs for in-pile evaluation studies. The canning of the production test slugs is expected to be completed during October.

Production test 105-580-A authorizes the irradiation of eight solid unbonded natural uranium slugs; two to 200 MWD/T, two to 400 MWD/T, and four to 650-750 MWD/T. It also authorizes the irradiation of four cored unbonded enriched slugs and 36 cored unbonded natural slugs to rupture in one tube. The two solid natural uranium slugs to be irradiated to 200 MWD/T were charged September 16 in tube 0675 of C Pile. This tube, despite its location, is running at high tube power. One slug was charged at the center line and one at the downstream end of the active flux zone. The two slugs scheduled for 400 MWD/T were charged in tube 1070 of H Pile September 30. The remainder of the tube in each of the two-four slug irradiations is filled with solid uranium lead dip canned production slugs. The four slugs scheduled for 650-750 MWD/T were charged in tube 1073 of H Pile on September 30. Irradiation of the tube charge of 36 cored unbonded natural uranium slugs and four cored unbonded enriched slugs will await initial examination of the 200 MWD/T charge. Initial examination of these slugs and subsequent charging of the full tube charge will probably occur about November 1.

Two of the four 4-inch mechanically bonded slugs having cold closures charged into D Pile under PT-105-575-A, HW-31439, are scheduled for discharge about October 4, 1954. The slugs have been operating at 30 kw/ft and will have accumulated approximately 380 MWD/T exposure at the time of discharge. Examination of two discharged slugs is currently scheduled for October.

On August 28, 1954, two 4-inch mechanically bonded slugs with cold closures were discharged from the high temperature loop facility at H Pile. These slugs were exposed approximately seven weeks at local water temperature of about 125 C. Both pieces are to be examined for possible aluminum-uranium diffusion.

A study of the feasibility of rod and plate fuel element bundles has been initiated.

#### Fuel Materials Studies

Only limited success has been obtained in the attempts to produce uranium metal shot in the 12-foot shot tower installed in the 326 Building. Experimentation with various inert atmospheres and the sealing of the uranium metal in a breakable quartz capsule have eliminated many of the problems associated with the formation of a

## Applied Research Sub-Section

tenacious oxide on the metal which hinders the pouring of the molten metal. The molten metal has been poured through 0.050" and 0.062" orifices; however, the metal does not have time to freeze in the short time interval required for the 12-foot fall. The experimental facilities are being installed on the vertical safety rod test tower at White Bluffs where a 100-foot fall will be available.

Zirconium has been exposed to liquid magnesium at 750 C, under an inert atmosphere, for times ranging from 5 to 40 minutes. Metallographic examination of the samples indicated no attack (solution, compounding, intergranular penetration, or diffusion) of the molten Mg on the Zr. However, the test will be repeated, since this observation is contrary to some reports in the literature, and since a barrier of zirconium oxide which may have controlled the reaction was observed on the sample.

A study of a proposed thorium-uranium fuel material has been initiated. In many respects this system is comparable to the uranium-magnesium matrix type fuel system which is currently being evaluated for high burn-out applications. Five thorium-uranium melts have been prepared in the vacuum melting furnace and annealing and fabrication studies are in progress to determine the optimum conditions for homogenizing and dispersing the uranium throughout the thorium. The alloys prepared have nominal compositions of two percent and ten percent uranium. Metallographic studies completed to date indicate that fast cooling from the molten state will produce a dispersed uranium phase in a thorium matrix in the case of the low uranium content alloys. Slow cooling of the 10% thorium-uranium alloy yielded a eutectic network structure - the uranium phase being predominately located at the thorium grain boundaries.

Uranium Reduction Studies

One of the major problems associated with the reduction of  $UO_2$  with magnesium at temperatures below the melting point of uranium is the resistance to penetration by magnesium of the  $MgO$  film formed surrounding the oxide particle being reduced. This difficulty can be resolved by carrying out the reaction in the presence of a solvent for  $MgO$ . No solubilities of  $MgO$  have yet been measured, but possible solvents are under study. The system  $CaF_2$ - $MgF_2$ - $LiF$  is of interest because all three metals are thermodynamically capable of reducing  $UO_2$  to metal, and because of the sublimation of  $Li_2O$  at temperatures below 1000 C. The phase diagrams of the systems  $CaF_2$ - $MgF_2$  and  $MgF_2$ - $LiF$  are known, showing, respectively, no intermediate compounds or solid solutions and an eutectic at 735 C. The phase diagram of the system  $CaF_2$ - $LiF$  was determined during the month, showing no intermediate compounds or solid solutions and an eutectic at 80.5 mole percent  $LiF$  melting at 768 C. Preliminary measurements made on the ternary system  $CaF_2$ - $MgF_2$ - $LiF$  indicate a ternary eutectic melting at about 660 C located very roughly at about 20 mole percent each of  $CaF_2$  and  $MgF_2$ . The solubility of  $MgO$ , and also of  $Mg$ ,  $UO_2$  and  $Li_2O$  must be considered in light of such a reaction as



known to proceed as indicated at temperatures above a few hundred degrees C. A ternary mixture of fused  $CaF_2$ - $MgF_2$ - $LiF$  containing oxide can be thus regenerated by volatilizing out  $Li_2O$  at temperatures below 1000 C. Preliminary estimates of the ternary phase diagram show the possibility of reducing  $UO_2$  with Mg starting in a  $CaF_2$ - $LiF$  mixture, removing oxygen by volatilization of  $Li_2O$ , until a fused salt mixture of  $CaF_2$ - $MgF_2$  is attained, at all times maintaining a melting point of not over 1000 C.

1215331

Pd-16

**DECLASSIFIED**

## Applied Research Sub-Section

Powdered  $UO_2$  and 10 percent stoichiometric excess magnesium for reduction have been mixed and pelleted (to give pellets an average density greater than that of the fused salt mixture), dropped into  $CaF_2$ - $LiF$  eutectic under argon at 900 C, held at 900 C for three hours, and cooled to room temperature. Preliminary microscopic examination of the solidified material shows much in the way of rounded metal particles of about 0.02 mm diameter maximum. Attempts to consolidate the metal resulted in only a sponge-like mass due to insufficiently high available temperature.

The solubilities of the  $UF_4 \cdot NH_4F$  double salt in various concentrations of ammonium bifluoride are of interest in connection with use of this compound for reduction to metal. There were found to be ca. 0.2 g U/l in 1.0 to 0.5 molar ammonium bifluoride, and 0.1 to 0.3 g U/l in the range of 0.5 to 0.1 molar ammonium bifluoride. Below 0.1 molar bifluoride the solubility of the double salt rises rapidly. These are not equilibrium solubilities, but rather indicative of what may be obtained during precipitation and washing. Solutions of 0.2 molar bifluoride should prove satisfactory for washing the double salt.

A sample of uranium metal prepared by a calcium reduction of the above double salt was dissolved in acid and found to contain only 600 ppm iron. The double salts and the uranium tetrafluoride from decomposition of the double salts, on the other hand, have averaged 0.5 percent iron, which indicates that a separation is realized during reduction. Additional uranium samples are now being analyzed for iron contamination.

Five batches of uranium calcium fluoride have been prepared by precipitation from UNH solution. Ferrous ion added as solid ferrous chloride was used for reduction of uranium(VI) to uranium(IV). The best precipitates were obtained when a ten percent solution of aqueous hydrogen fluoride was added to the UNH solution in which ferrous and calcium chloride had been dissolved. To obtain satisfactory dissolution of the ferrous and calcium salts, the solution of UNH should be less than 1.0 molar. A crystalline precipitate is obtained which washes easily in 0.5 molar hydrogen fluoride. X-ray studies have shown that the precipitate is a true double salt and not a mixture of the two insoluble fluorides of calcium and uranium. Waste losses during precipitation have averaged about two percent while solubility losses during washing were 0.4 percent. These high losses it is felt are due to post precipitation which should be eliminated by a longer hold-up before filtering. Composition of the double salt is expected to be  $UCaF_6 \cdot xH_2O$ . However, analytical data are not yet available. The hydrated double salt apparently releases its water at temperatures below 200 C yielding a compound which should prove satisfactory for reduction to metal. Studies on the solubility of the  $UCaF_6 \cdot xH_2O$  double salt in various wash solutions, its dehydration and reduction to the metal will be continued.

MTR Fuel Element Testing Facility

At the end of September the three four-inch slugs (Al-Si canned solid and cored, and hot-pressed solid) in the MTR Fuel Element Testing Facility had accumulated about 400 MWD/T exposure. There have been no scrams caused by the GEH-4 equipment and the monitor, flow, and pressure readings have shown no indication of a failure or incipient failure. Because of misunderstandings and a scheduling conflict, the A-block containing these three fuel elements will be removed from the reactor on the October 18 shutdown, at which time the exposure will be about 550 MWD/T. The specimens are operating at a specific power of 55-58 kw/ft of which an estimated 50 kw/ft is due to fission heating and the remainder to gamma heating.

## Applied Research Sub-Section

Radiometallurgy Examination

Three of the four enriched, cored slugs which were irradiated to 1550-1600 MWD/T in C Pile under PT-105-513 have been transferred to the Radiometallurgy Building. Initial examination of the one ruptured slug, as previously reported, showed that the rupture most probably occurred because of internal cracking in the uranium. Measurements on molds made of two of the unruptured cored slugs indicated that the slugs had increased in diameter about 0.015" and had decreased in length about 0.035" during irradiation. This performance correlates well with the predicted behavior based on the preferred orientation known to exist in the uranium metal. Determination of core behavior will be made by sectioning the slugs in the cut-off box.

The examination was started on the ruptured thorium slug that had an exposure of 1230 MWD/AT. The weld area looked sound and no obvious reasons for the cause of failure could be ascertained. An interim report is in progress.

During the routine metallographic examination of slugs, can wall thickness measurements are made to determine the degree of uniformity of corrosive attack on the slugs by the cooling water. The examination of can wall sections from three slug failures from PT-25-M (beta heat treated rods), performed at 2" from the cap end, indicated only a slight removal of the can wall by corrosion.

Rupture #381 from PT-25-M was received and examined. It was a cap type failure with a 1/2" deep large size crater in the cap end of the uranium. The cap assembly was not received. The base was removed and length measurements revealed that the length of the periphery of the slug varied from 8.292" to 8.327". The original length was  $8.325 \pm .010$ ". The base end was dished 29 mils. An interim report covering the photography, length and diameter measurements, and x-ray studies of four of these ruptures has been issued as document HW-33084.

Investigation of a cold canned "J" slug which was discharged on 7/14/54 from tube 2868-DR revealed an area on the side wall of the can which appeared to be melted. A sample of the can wall in the melted area was removed and submitted for spectrochemical and metallographic analysis. Spectrochemical analysis indicated that about 10 percent cadmium existed in the affected area. Another sample was taken within two inches of the first sample but still within the apparently melted area. Spectrochemical analyses of this sample showed no unusual elements. Investigation is continuing.

Radiometallurgy Facilities and Equipment

The density cell is now completed and a report is now in progress covering the operation of the unit. Equipment for making bend tests on 1" gauge length specimens has been completed and cold tests have been conducted. The cut-off box motor has been repaired and installed. One non-irradiated slug was cut to establish the operation of the box and a filter tray is being installed prior to placing the lead brick around the cell. The amount of acid fumes within the metallographic cell has created a corrosion problem with the equipment. A new macro and micro etching box is now being built to assist in surmounting the corrosion problem and to facilitate metallographic examination.

1215333

Fd-18

DECLASSIFIED

Applied Research Sub-Section

Separations Plant Corrosion Problems

To date three BiPO<sub>4</sub> process vessels have been opened for examination. They are the T Plant D-1 (T-D-1) precipitator and the B Plant D-1 (B-D-1) and E-1 (B-E-1) precipitators. T-D-1 was removed from T Plant after failing in April 1954, and was replaced by the A-1 precipitator from B Plant. Examination of the exterior of T-D-1 revealed that one of the seam welds joining the segments of the dished bottom was leaking through the center of the weld at several points. Examination of the interior of T-D-1 resulted in the following observations:

1. The welds below the liquid level (about 30 inches from the bottom) were all corroded to a depth of approximately two-thirds of the wall thickness.
2. The longitudinal weld seams of a dip leg that had fallen into the tank was completely corroded away leaving a slot the full length of the pipe. The longitudinal welds in all the other dip legs were severely attacked below the liquid level.
3. Several of the fillet welds holding baffle support gussets to the sheel were completely corroded away, and the gussets were laying in the bottom of the vessel.

Visual examination of B-D-1 indicated the following conditions:

1. The welds below the liquid level (about 30 inches from the bottom) were all corroded to a depth of about one-half the wall thickness.
2. All the weld craters were attacked to a greater degree than the weld seams. Some of the craters were corroded to a depth of greater than three-eighths of an inch.
3. Several threaded spray caps which had corroded off of dip legs were found in the bottom of the vessel.
4. The longitudinal weld seams in the dip legs and the fillet welds attacking the baffle support gussets were severely corroded but in only one case of each type was the weld completely gone.

Visual examination of B-E-1 indicated the following facts:

1. All of the weld craters were severely attacked and several of them were corroded to a depth of greater than 1/4".
2. The weld seams suffered more corrosive attack than the wrought plate. In local areas the welds were corroded to a depth of approximately 1/16" with respect to the wrought material.
3. Several cracks were found in the wrought material which formed the baffle support gussets. Most of the cracks started at the edge of the plate and progressed immediately adjacent to and parallel with

## Applied Research Sub-Section

the fillet welds attacking the baffle support gussets to the vessel wall. Some of the cracks were less than an inch long but many were three to four inches long. At least two cracks were found which branched into the gussets perpendicular to the weld seam.

In all three vessels all of the weld metal had been preferentially attacked with respect to wrought material. The wrought material suffered relatively light corrosive attack as evidenced by the clearly legible and sharply defined heat numbers stamped into the plate. It should be pointed out that the extent of corrosion appears to correlate very well with the total through-put of each vessel. T-D-1 total through-put equals approximately 140 percent of B-D-1 through-put and since B-E-1 and B-B-1 are in parallel service, B-E-1 through-put equals approximately 50 percent of B-D-1 through-put. Indications are that all of the material used in the fabrication of these three vessels was AISI type 309SCb stainless steel.

Tests consisting of immersing all weld metal specimens of type 309SCb and type 308L weld metal in synthetic D-1 solution at 75 C are being carried out in the corrosion laboratory.

In view of the information available at the present time, it is recommended (1) that neither the D-1 nor E-1 vessels be placed in service without being re-welded, and (2) that all B Plant vessels be thoroughly inspected prior to B Plant start-up.

In an attempt to more closely duplicate the heat exchanger equipment of the separations plant a mock-up vessel (F-55 pot) has been designed, built, and installed in the corrosion laboratory. This piece of equipment is capable of exposing six individually controlled heat exchangers of the bayonet type simultaneously, using steam as a heat source. The test specimens consist of stainless steel thimbles which can be weighed, measured, sectioned, and examined visually. The test pieces may be operated either partially submerged or totally submerged in the test medium. The system is static in nature with the corrosive medium being under total reflux. The first calibration run is in progress using six type 304L stainless steel thimbles operating at 85 psig steam pressure in a simulated Purex 1WW waste stream. (No. 1 acid concentrator bottoms) Since this stream is believed to be one of the most corrosive streams in the Purex plant, the initial runs on this equipment should indicate the order of magnitude of the corrosion problems to be encountered during the operation of the Purex facility.

### Welding Studies

At the request of Project Section an examination was made of two Purex acid concentrators to determine the quality of welding in the overflow section of the vessels. It was determined from visual examination that some of the welds were defective. Five sections which contained some of the defective welds were trepanned from the vessel and were prepared for metallurgical examination. Microscopic and macroscopic examination revealed that the welds contained cracks and slag inclusions, and that in some places only 50 percent penetration of the joints was attained. The defects noted are considered to be detrimental to the life of the vessels in the corrosive service which they are intended to serve. Methods of repair were recommended which are considered to be adequate to insure that the vessels will be of a quality equal

**DECLASSIFIED**  
**WITH DELETIONS**

HW-33200

DEL

Applied Research Sub-Section

to that which was to be expected had these particular welds been free of defects. However, it is considered that the best method of repair would have been to replace the overflow sections if materials were available and construction schedules would permit.

The industrial practice of mixing small percentages (one to five percent) of oxygen with argon when welding stainless steel by the MIG (metal inert gas consumable electrode) process has been prohibited at HAPO because it has been considered that the oxygen may reduce the corrosion resistance of the welds. Since small percentages of oxygen in the argon greatly improve the welding characteristics of stainless steels with this process, a study is under way to determine if small percentages of oxygen in the shielding gas actually impair the corrosion resistance of the welds. All weld metal specimens of types 347 and 308L weld materials have been prepared for corrosion testing using pure argon, 95 percent argon and 5 percent oxygen, and 98 percent oxygen and 2 percent oxygen. Several different heats of welding wire will be tested.

A grit blasting device operated with inert gas and magnesium oxide grit has been installed and used in a laboratory hood. The device rapidly cleans surfaces of films by mechanical abrasion. It is being used to prepare surfaces for bonding studies.

The cathodic vacuum etching apparatus has been tested on aluminum. A slow rate of sputtering was achieved. Etching of cerium is now being tried because of its similarity to plutonium.

The SR-4 load cell protection device was completed and calibrated. This device will prevent overloading and damaging the sensitive SR-4 strain gages when tests are made that exceed the rating of the load cell. The load cell is installed in the universal testing machine to accurately measure small loads.

Fd-21

1215336

Applied Research Sub-Section

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 September, 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.

*J. W. Albright*

Manager - Applied Research  
ENGINEERING DEPARTMENT

FWA:kb

DECLASSIFIED



DECLASSIFIED

HW-33200 JEL

RICHLAND, WASHINGTON . . . . . HANFORD ATOMIC PRODUCTS OPERATION

October 4, 1954

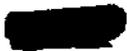
This document consists of  
\_\_\_\_\_ pages. No. \_\_\_\_\_ of  
\_\_\_\_\_ copies. Series A.

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

SEPTEMBER, 1954

1215338



VISITORS AND BUSINESS TRIPS

<u>Name</u>	<u>Date</u>	<u>Address</u>	<u>Purpose</u>
H. H. Hausner	9/9-10/54	Sylvania Elec. Prod., Long Island, New York	Discussions of Contract #AT 30-1-GEN-366

<u>Name</u>	<u>Date</u>	<u>Place Visited</u>	<u>Purpose</u>
G. E. McCullough	9/1/54	Bridgeport Brass Co., Adrian, Michigan	Discussions of fuel element technology
R. G. Post	9/1-3/54	Hanson-Van Winkle Munning Co., Matawan, N. J.	Consultation with vendor on engineering problems
J. W. Riches	9/1-5/54	Bridgeport Brass Co., Adrian, Michigan	Fabrication of uranium
P. D. Wright	9/1-3/54	Bridgeport Brass Co., Adrian, Michigan	Fabrication of uranium
D. F. Snoeberger	9/7-11/54	du Pont Co., Aiken, S. C.	Thorium Working Committee meeting
J. A. Ayres	9/10-19/54	American Chemical Society, N. Y., N. Y.	Attend National Conference
G. E. McCullough	9/12-21/54	BMI, Columbus, Ohio	Discussions of fuel element technology
		KAPL, Schenectady, N.Y.	Same as above
		AEC, Washington, D. C.	Same as above
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above
W. T. Kattner	9/19-30/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Uranium metallurgy
		NLO, Cincinnati, O.	Same as above
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above

DECLASSIFIED

**GENERAL ELECTRIC**  
COMPANY

Fuel Technology Sub-Section

HW-33200

DEL

**DECLASSIFIED**

VISITORS AND BUSINESS TRIPS

<u>Name</u>	<u>Date</u>	<u>Place Visited</u>	<u>Purpose</u>
W. T. Kattner	9/19-30/54	Bridgeport Brass Co., Adrian, Michigan	Uranium metallurgy
		BMI, Columbus, Ohio	Same as above
		Ames Laboratory, Ames, Iowa	Same as above
J. W. Riches	9/19-30/54	Same as W. T. Kattner.	
P. J. Pankaskie	9/20-27/54	Chase Brass Co., Waterbury, Conn.	Zirconium fabrication
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above

ORGANIZATION & PERSONNEL

Personnel totals as of September 30 were as follows:

	<u>Exempt</u>	<u>Technical Graduates</u>		<u>Non-Exempt</u>	<u>Total</u>
		<u>Permanent</u>	<u>Rotational</u>		
Fuel Assembly Unit	17	1	--	12	30
Fuel Element Development Unit	13	1	3	11	28
Fuel Evaluation Unit	13	--	--	12	25
Coatings & Corrosion Unit	10	1	--	7	18
Testing Methods Unit	6	1	--	2	9
Technical Shops Unit	4	--	--	24	28
Administration	<u>1</u>	<u>--</u>	<u>--</u>	<u>4</u>	<u>5</u>
Totals	64	4	3	72	143

1215340

FUEL COMPONENT DEVELOPMENTURANIUM QUALITYHydrogen in Uranium

The production test to determine the effect of hydrogen on the irradiation characteristics of uranium has been temporarily delayed. The marked and heat treated rods to have been used were inadvertently bar turned at FMPC and the identification marks lost. However, new stock has been rolled and set aside at FMPC for ultrasonic measurement and will be marked, salt bath beta heat treated and shipped to HAPO soon.

Heat Treatment

The recent high rejection rate of canned slugs because of porous bonds has led to a concentrated evaluation of where, in the present beta heat treating process, gas is being introduced to the uranium. Data indicate that the lots of material with the highest rejection rate for bond porosity during lead dip canning were heat treated at FMPC in the new automatic heat treating furnace. Samples of the salt have been obtained and are being analyzed. Simulated heat treatments are being made and the resulting material analyzed for hydrogen content, and the process as a whole is being carefully studied to determine the difference between the new and old heat treating furnaces.

More studies, directed at a solution of the rupture problem of lead dip canned cores, have been made on the effect of quench rates on end dishing, hydrogen content, and on warping of slugs. Dilatometer specimens obtained at several points in specific pieces, heat treated by different techniques, are in the laboratories, but data are not yet complete. Macro and micro studies will be made on these samples. The merits of isothermal quenching uranium are being explored as a possible solution to a reduced hydrogen content with a production-compatible structure. Direct comparisons are being made between slug heat treatment and rod heat treatment.

URANIUM DEVELOPMENTCored Slugs

The two remaining tubes of four-inch cored slugs and the companion tubes of four-inch solid slugs, canned under PT 313-38-MT for irradiation under PT 105-570-A, were charged into F File on September 14. The cored slugs charged in C File under this test in July have reached approximately 200 MWD/T without incidence. A total of 36 acceptable canned cored eight-inch slugs, fabricated from hollow extruded uranium rod, were realized from the canning under PT 313-44-MT. These pieces will be shipped to the area for irradiation under PT 105-588-A to a goal exposure of 900 MWD/T.

DECLASSIFIED

GENERAL ELECTRIC  
COMPANY

Fuel Technology Sub-Section

HW-33200 DEL

DECLASSIFIED

Fabrication of Uranium

The successful extrusion of thirty-two unalloyed uranium billets was carried out at Adrian on August 31 and September 1. Examination of the extruded material showed the hole to be round and concentric within desired tolerance. From this extrusion trial the conditions necessary for production of hollow uranium rods with a 1/4" hole have been developed. The third extrusion trial is being held at Adrian on September 28, 29, and 30. At this time, the extrusion of hollow rods of silicon alloy, chromium alloy, titanium alloy, and silicon plus titanium alloy will be attempted. In addition, the extrusion of twelve billets of unalloyed uranium is contemplated.

Additional metallographic specimens from the heat treated rods, extruded in June, were examined. The unpickled and pickled derby samples exhibited a heat treated grain size of approximately 0.120 mm. The unpickled derby exhibited a large amount of subgraining as opposed to the uniform structure exhibited by the pickled derby. X-ray analysis of the heat treated structure shows a definite (200) orientation and a slight (110) orientation on the two samples examined.

Five control tubes of metal to be irradiated under PT 105-576-A, Irradiation of Powder Metal Compacts, were charged into C Pile. These tubes consisted of one tube each of derby compacts, ingot compacts and four-inch production Z metal and two tubes of mixed charges of all three types of metal. The mixed tubes will be discharged at 200 and 400 MWD/T and based on their post-irradiation examination one tube of compacts and the tube of production metal will be taken to rupture. The balance of the powder metal compacts which have been canned will be taken to 600 MWD/T in F Pile.

The need for zirconium canned fuel elements for in-pile testing has accelerated the direct casting program. Two successful "cluster" castings of uranium into drawn zirconium cans have been made - one of 15 four-inch slugs and one of 14 eight-inch slugs. Some minor modifications are planned in the design of the hot-top arrangements prior to casting another cluster of slugs. These slugs will be capped and heliarc welded for test use in the H Pile Loop.

Uranium Alloys

Twenty-eight acceptable eight-inch canned slugs have been realized from the uranium - 1.5 atomic per cent silicon alloy extruded at Adrian in June and canned under PT 313-46-MT. These pieces are being weighed and measured and will be shipped to the piles for irradiation to 900 MWD/T. A program to determine the effect of small additions of Ni, Mo, Fe, Al, V, or Ti to the 1.5 atomic per cent silicon alloy has been initiated. The effect of these additions on the structure and properties of the alloy will be investigated.

JACKETING COMPONENTSUniskan

Preliminary engineering data on zirconium which was uniskanned to several thicknesses have been obtained this month. These data on zirconium, and other metals now under investigation, will assist in the evaluation of uniskanning as a metal forming process of potential use in fuel element fabrication.

Cold Closure

The cold pressure-weld canning of elements for PT 313-43-MT was delayed this month because it was found necessary to revise the dimensions of the pre-fabricated aluminum cups which were received from Hunter-Douglas Company. Eight elements were canned using variable can height, outside wall diameter, and annealing practices. Desirable dimensions and procedure were agreed upon jointly by Applied Research-Metallurgy and Fuel Technology-Jacketing Components. At this writing, 58 elements for the production test have been made, four of which were sectioned for examination and found to be satisfactory.

Alloy Studies

Corrosion coupons have been prepared from high purity aluminum alloys and will be tested in the flow cup laboratory and in the high temperature autoclave. These data, when available, will assist in the evaluation and possible selection of an alloy, which may have better corrosion resistance than present 2S can stock.

Specimens of various aluminum alloys were received and prepared for minitube corrosion tests, data from which will assist in the evaluation and selection of an aluminum process tube alloy for optimum service life.

Six Zircaloy 2 billets were extruded to process tube blanks by Chase Brass Company. Within the next 30 days these blanks will be tube reduced to H Pile size process tubes by Superior Tube Company. The timing regarding production of K Pile size process tubes is being reviewed in view of urgency for uranium extrusion.

FUEL ASSEMBLY DEVELOPMENTBraze Layer Porosity in Lead Dipped Slugs

Gross porosity in the braze layers of lead dip canned fuel elements has severely limited slug production in recent weeks. As many as 75 per cent of the slugs in some lots have been rejected for porosity, which is associated with the use of slug cores heat treated in a new submerged electrode furnace at Fernald. More moderate amounts of porosity found with uranium heated in slug form at HAPO (particularly Mallinckrodt metal) have also significantly reduced canning yields. The porosity apparently results from the outgassing of hydrogen from the slug

1215343

SECRET  
Fe-6**DECLASSIFIED**

**GENERAL ELECTRIC**  
COMPANY

Fuel Technology Sub-Section

**DECLASSIFIED**

HW-33200-100

core during the canning and becomes severe when the hydrogen content of the uranium exceeds about 2 ppm. The recent process changes coincident with the use of the new Fernald heat treating facilities and the recent process conditions during ingot manufacture at Mallinckrodt are being reviewed to determine what factors have lead to increased susceptibility to hydrogen pick-up and increased hydrogen contents.

Thorium Quality

It had become apparent during preparation of the slugs for the J-Q load that unsound slug cores were contributing to the difficulty of forming void-free welded closure ("C" Process canning). Destructive examination of selected cores revealed gross voids in cores where this condition could not be visually determined prior to canning. Retention of moisture in these voids from the core cleaning operations is believed to be responsible for inability to complete the closures on some slugs.

Hot Pressed "J" Alloy Slugs

Hot press canning of "J" alloy slugs was discontinued as no further shipments to the reactors were required at this time. Dummy slugs and a few "J" alloy pieces were canned during the month for the purpose of putting the new Manufacturing facilities in Building 314 on an operable basis.

Simulated Rupture Testing of Unbonded Slugs

To test aspects of the hypothesis that the uranium core of an unbonded fuel element can split without splitting the aluminum can - as is normally observed for bonded types - hollow uranium slugs were canned both by the lead dip process and the "C" (unbonded) process. These were burst hydrostatically using lead under pressure. Splitting of the uranium cores ruptured the jacket of the bonded slug but did not rupture the can of the unbonded slug. The result is indicative although the nature of the splits in the uranium are not directly comparable to those found in slugs ruptured during irradiation, particularly with regard to extent.

Mechanical Cleaning of Filler Wire

A device for mechanically cleaning the 2S aluminum filler wire used for Filler-welding slug closures was devised and is undergoing trial. The device is made part of the wire feeding mechanism of the welder and, if successful, would obviate the need for frequent chemical deoxidation of filler wire supply. An invention report was prepared.

Hot Press Canning of Uranium

Two hundred and thirty-six hot press canned, nickel plated, solid uranium fuel elements were charged in C Pile on September 3. One tube is scheduled for discharge at 300 MWD/T November 1.

1215344

Approximately 120 hot press canned, nickel plated, externally cooled only, cored uranium elements were shipped to C File for charging during the month end shut-down. A yield of about 85 per cent was obtained during the canning operation.

Canning of hot-pressed, nickel plated, internally and externally cooled elements has commenced. About 225 pieces will be canned for irradiation at C File.

#### Hot Press Canning of Thorium

In an effort to develop a technique for preparation of two tubes of bonded thorium slugs for pile irradiation, thorium wafers which were plated with iron, copper, and nickel, together with unplated wafers were diffusion bonded by hot press canning. The highest strengths - approximately 8000 psi - were obtained with nickel plated and unplated pieces. On the basis of this information, several full-size bare thorium cores were hot press canned. Numerous unbond areas were noted on each piece, apparently resulting from a gas evolving material entrapped in the thorium metal. Additional pieces are being vacuum outgassed prior to canning. It may not be possible to hot press can satisfactorily thorium cores of the quality presently on hand.

#### Fuel Element Pilot Plant and Other Projects

The Phase II portion (interior construction and equipment installation) of the Fuel Element Pilot Plant is approximately 40 per cent complete. The order for the electroplating equipment was placed. Delivery is expected within 26 weeks. The revised project proposal for the pilot plant has been approved by General Electric and is awaiting A.E.C. approval. Except for installation of stainless steel sinks the 314 Building project has been completed. Schedule estimates indicate that initial operation of a semi-works line in the pilot plant will be possible the last part of March, 1955.

### FUEL EVALUATION

#### Fuel Examination

After irradiation to exposures between 156 and 834 MWD/T, twelve slugs from the production test for irradiation of 0.4 atomic per cent chromium-uranium alloy were stripped of their aluminum jackets for examination. Severe longitudinal cracks were found. The one piece exposed to 834 MWD/T broke into three pieces during handling. These cracks are more severe than observed in natural uranium slugs. Further studies are being made.

The 105-C Metal Examination Facility should be ready for installation of equipment by the middle of October.

The slug profilometer recently installed in the 105-B basin for the dimensioning of irradiated slugs has been calibrated and found to be accurate to  $\pm$  one mil for diameters. After mechanical adjustments, accuracy of  $\pm$  two mils should be available for warp measurement.

**GENERAL ELECTRIC**  
COMPANY

Fuel Technology Sub-Section

HW-33200

DECLASSIFIED

Fuel Assessment

The more versatile and finer balancing features of the new woodsplitter work station permit operation at unity power factor for testing of slugs ranging from three to eight inches in length and from 1.290 to 1.440 inches in diameter. Usable power has been increased by about seven per cent (14 KW) of the machine rated output. With this additional power, approximate maximum core temperatures attainable were raised from 700 to 840 C for four-inch slugs and from 600 to 690 C for eight-inch slugs.

TESTING METHODS

The second model of MIZ-1 Al-Si penetration detector has been checked out and put through stability tests which indicate much improved stability over the first model. The equipment will be moved to the 313 Building for evaluation by Manufacturing as a production tool.

Production line testing of the ultrasonic bond test revealed a number of difficulties which could not be corrected in the production buildings so the equipment was returned to the laboratory for modification. This is now complete as far as possible on the existing equipment and the bond test will be returned to the 313 Building about October 4. One modification not yet made which will increase the band-width of the high frequency amplifier will make tuning adjustments less critical. A new high frequency amplifier is being designed and will be put into service as soon as possible. These two instruments will both be evaluated with a newly constructed skewed roller conveyor which, in addition to giving a smoother scan, is simpler in operation and cheaper to build than the multiple wheel conveyors previously used.

Testing of a sample of Fernald (4) slugs by the sonic technique to determine the amount of preferred orientation present has begun.

COATINGS AND CORROSION

Corrosion Studies

The last tube of slugs from the production test to study effect of thermogalvanic corrosion in the pile has been pushed. Examinations have shown that the thermogalvanic effect is so small that it cannot be measured under conditions which are likely to occur in the pile.

Statistical analyses of flow cup data have shown that 63S has a much lower corrosion rate than that of 2S, 72S, or 99.45 per cent aluminum. The studies of the effect on corrosion of galvanic currents between different aluminum alloys have been stopped, because a critical examination has shown that no useful information

1215346

DECLASSIFIED

may be obtained with the equipment being used. To demonstrate any effect which could be interpreted with any confidence would require extremely elaborate and expensive equipment. The flow cups will still be used to measure galvanic corrosion between dissimilar metals.

#### High Temperature Corrosion

The studies of corrosion of aluminum in deionized water at 275 C are continuing. The tests to date, all static, have shown that some alloys disintegrate completely in six hours, while others have a thick oxide film. Additional autoclaves suitable for testing at temperatures above the critical temperature of water have arrived and are being installed.

#### Anodized Films

The production test to determine the effect of pile exposure on anodized films is continuing. An examination of the first tube discharged from the test showed that the method of anodizing and sealing can greatly improve the resistance of the film to pile conditions. Samples which had been anodized in sulfuric acid and sealed at a low pH were not as satisfactory as those which had been anodized in oxalic acid and sealed in water at a pH of 6-7.

#### Electroplating Studies

The procedure for electroplating uranium with iron and then putting on a flash of either copper or bronze is being perfected for possible use in hot pressing assemblies. There seems to be no apparent difficulties in putting on a dual plate having a thickness of approximately 0.0005 inches. Test pile measurements show that this plate results in less reactivity loss than is the case for nickel electroplates. The bond is good but not as strong as with the nickel-plated slugs. None of the electroplated layers which have been put on here at Hanford have shown any corrosion resistance in the as-plated or heat-treated conditions. Tests to show the corrosion-resistance of these layers after hot pressing are being designed.

Some studies to find the best method of producing a thin, uniform electroplate have been started. This can be done probably by starting with a smooth, electro-polished slug and plating in two or more operations from special baths. Such plates may be valuable as extremely thin (<0.0001-inch) uranium diffusion barriers or as secondary corrosion barriers for unbonded fuel elements or as initiators for desired diffusion bonding in assembling hot pressed slugs of certain types.

DECLASSIFIED

GENERAL ELECTRIC  
COMPANY

Fuel Technology Sub-Section

DECLASSIFIED

HW-33200  Del

INVENTIONS

All Fuel Technology 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 September, 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

J. W. Lingafelter

Inert-Gas-Shielded-Arc-Welding

*W. McCullough*  
Manager - Fuel Technology  
ENGINEERING DEPARTMENT

GE McCullough:acj

MONTHLY REPORT  
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

C. W. Shanks, Pacific Scientific Co., Portland, Ore., visited Hanford on Sept. 1st to 3rd to service gas analyzers installed by his company.

Roy Robbins, General Electric Co., Schenectady, N.Y., and C. B. Hinton, General Electric Co., Spokane, Wash., visited here on Sept. 13th to discuss relay applications.

R. L. Tower, Tower Equipment Co., Mercer Island, Wash., and W. O. Teeters, Hoke, Inc., Englewood, N.J., visited here from Sept. 27th to Oct. 2nd to investigate trouble encountered on toggle valves.

Lee Browne, Corps of Engineers, U. S. Army, Northern Pacific Division Laboratory, Troutdale, Ore., visited here on Sept. 29th to discuss future development program.

C. A. Pursel and G. L. Locke visited the University of Minnesota, Minneapolis, Minn., ANL, Lemont, Ill., Columbia University, New York City, N.Y., KAPL and General Electric Co., Schenectady, N.Y. on Aug. 30th to Sept. 3rd to collect information on burn out and two-phase flow.

L. O. Hasselblad visited General Electric Co., Schenectady, N.Y., on Sept. 6th through 10th to survey and study methods and procedures pertaining to preparation of specifications for procurement and fabrication of engineered materials and equipment.

M. T. Slind, W. A. Richards and M. E. Forsman attended the First International Instrument Congress and Exhibition, Philadelphia, Pa. on Sept. 13th through 19th to visit exhibits and obtain latest information on instrumentation.

Mr. Richards also visited and consulted Hoke, Inc., Englewood, N.J. regarding valves for CG-558 and CA-512-R Projects; Minneapolis-Honeywell Regulator Co., Brown Instrument Division, Philadelphia, Pa., regarding resistance thermometers; General Electric Co., Philadelphia, Pa., regarding special shelving for S. B. Badgett; Foxboro Co., Philadelphia, Pa., regarding flow problems relative to CG-558 Project; Simplex Valve & Meter Co., Philadelphia, Pa., regarding Project CG-558 filter plant controls; EIF Industries, Providence, R.I., regarding Project CG-558 plant controls; Hammel-Dahl Co., Providence, R. I. regarding valve design; and the Radiation Counter Laboratories, Inc., and Panellit, Inc., both of Skokie, Ill., regarding Projects CG-578, 579 and 558.

N. T. Hildreth visited Service Metals Co., Los Angeles, Cal., on Sept. 17th through 30th to inspect final assembly of the In-Line Alpha Monitor.

George A. Lehman visited Pacific Oerlikon Co., Tacoma, Wash., on Sept. 20th through 22nd to inspect the transformation machine being fabricated and authorize changes.

C. R. Bergdahl attended the 60th Annual Congress, American Public Works Association, Atlantic City, N.J., on Sept. 20th through 22nd to secure benefit in presentations, exhibits and contacts for Hanford Operations.

Design Section

**DECLASSIFIED**

HW-33200-DEL

E. R. Rudock visited Western Gear Works and Aluminum Co. of America, both at Seattle, Wash., on Sept. 21st to discuss fabrication details for nozzle assembly and sample x-ray techniques for aluminum castings.

G. F. Ehlers visited Bumstead-Woolford Co., Seattle, Wash. on Sept. 28th through 30th to examine Panel drawings on drafting board to expedite CA-512-R.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	<u>August 31</u>			<u>September 30</u>		
	<u>Exempt</u>	<u>Non Exempt</u>	<u>Total</u>	<u>Exempt</u>	<u>Non Exempt</u>	<u>Total</u>
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	67	13	80	67	13	80
Design Planning Unit	17	12	29	18	11	29
Design Engineering Sub-Section	82	10	92	82	11	93
Design Drafting Unit	8	87	95	8	86	96
Total Section Personnel	175	123	298	176	122	298
Technical Graduates (Rotational)	-	8	8	-	6	6
<b>TOTAL</b>	175	131	306	176	128	304

Accessions - 6  
Separations - 8

GENERAL

Design Section engineering and drafting effort for September was distributed approximately as follows:

	<u>Engineering Man Months Expended</u>	<u>Drafting Man Months Expended</u>	<u>% of Section Effort</u>
1952 Expansion Program	33.2	13.8	18.5
Reactor Plant Modification for Increased Production	26.6	25.6	20.7
4-X Program	9.1	1.5	4.2
Design Development	60.6	11.4	28.4
1706-KER Recirculation	5.2	8.9	5.6
Other	26.9	29.7	22.6
	161.6*	90.9*	100.0

\*Equivalent man months expended includes 2.1 months of engineering and 0.4 months of drafting. Approximately 3.7% of the Section personnel worked a six-day week.

The drafting production for the month was 299 new drawings, 8 charts and graphs and 235 revisions. The drafting room average was 4.3 man days per drawing.

1215350

DESIGN DEVELOPMENTStatistics:

The total number of engineering and drafting man months expended on research and development during September was distributed as follows:

	<u>Engineering</u>		<u>Drafting</u>	
	<u>Man Months</u>	<u>% of Total</u>	<u>Man Months</u>	<u>% of Total</u>
Metallurgical Design Development	4.8	7.9	1.0	8.8
Reactor Plant Design Development	25.5	42.1	4.4	38.6
Separations Plant Design Development	26.7	44.1	3.8	33.3
Chemical Processing and Reduction Design Development	2.5	4.1	0.7	6.1
234-5 Design Development	<u>1.1</u>	<u>1.8</u>	<u>1.5</u>	<u>13.2</u>
	60.6	100.0	11.4	100.0

Metallurgical Design Development

Development work on the prototype fuel element canning machine consisted of an improvement on the problem of assembly alignment. However, the status of new process developments for fuel elements is such that the development of mechanized dip canning is no longer timely. A final report is in the draft stage and a request has been made for a cost estimate on excessing of machine components. Future expenditures of development funds will be made on items applicable to reducing new process developments to production designs.

Reactor Plant Design Development

Reactor plant design development effort continued on a 1600 MW power level reactor and an interim feasibility report for an intermediate capacity dual-purpose reactor plant was issued.

A preliminary study was made concerning the potential power level increases which could be achieved if the rear face pressure of existing reactor plants were raised to permit operation at higher effluent temperatures. This study was made to evaluate work now planned for CG-558 to determine if the effluent system design might compromise such a pressurization program. The present effluent lines for CG-558 are not designed for pressurization and would require redesign or future replacement.

A study was made on the effect of loss of steam to the drives of the process pumps at 100-B, D, F, IR and H Reactor Plants. A document was issued which recommended that check valves should be placed in the steam lines entering the 190 Buildings. This recommendation was based on the desirability of preventing bulk boiling in the reactor effluent piping upon loss of steam.

Development was started on a low power level reactor and power recovery system. Preliminary design bases and a cost estimate were prepared.

DECLASSIFIED

Separations Plant Design Development

The Purex capacity study was substantially completed. Preliminary results indicate that jets, rotameters, steam traps, strainers, control valves, and other miscellaneous equipment are the bottlenecks below an instantaneous plant capacity factor of 2.0. Other than the extraction columns (which have a capacity factor of 2.0), the first major item of equipment to bottleneck will be the 2EU concentrator at a factor of about 2.4 and the HCP and ICU concentrators at a factor of about 2.5. The uranium lag storage with 90 day cooled material will be adequate but the process and steam condensate cribs will require percolation rates of 285 and 255 gallons/day/ft<sup>2</sup>, respectively.

Redox plant studies, concerned principally with the process ventilation problem, equipment improvements and capacity increases, continued. Scope design was completed on the nitric acid recovery and ammonia removal facilities. The ventilation study was completed outlining two alternate systems for providing increased ventilation capacity. Tests were completed on the D-12 tube bundles and the steam traps were determined to be limiting the heat transfer capacity. Improved performance could be obtained without the use of a trap; an orifice may be sufficient. The scope document for a new design for the H-4 oxidizer was completed. Redesign of a removable heat-transfer bundle was required. In this connection, other bundle designs were studied. Scope design was continued on alternate tail-end ozonization facilities for final product activity cleanup.

The TRX study was completed and a feasibility report was issued for consideration by management. The study indicated that the facilities are not economically feasible on a short term basis. The BPI study was started during the month and provides for the shutdown of the TBP and T Plants by converting the B Plant to a solvent extraction facility.

Study of the UO<sub>3</sub> Plant capacity is continuing with respect to the NO<sub>2</sub> fume system and with respect to the powder unloading system. These items are being performed in conjunction with the 4-X Program UO<sub>3</sub> Plant Expansion studies.

Fabrication of a prototype in-line alpha monitor for separations process streams continued during the month. Assistance is being given to the vendor as needed. Some component fabrication is being performed on-site.

Chemical Processing and Reduction Design Development

Testing work on a furnace door seal was completed. A report was written covering this phase of the horizontal furnace improvement studies.

234-5 Design Development

Work was continued on an alternate scheme for remote automatic machining. This method employs the use of a commercial duplicator or tracer attachment to a vertical type lathe.

Engineering Standards and Materials Development

Cost to date for development of engineering standards for the current fiscal year is \$24,277.

The following Standards, design instructions and revised standards, were completed and issued during the month:

HW-5310-S	"Standard Specification for Identifying Metals in Stock"
B-3-0	"Piping Systems - Cylinder Gas"
DI-4798-S	"Instructions to Design Engineers for Use of HW-4798-S"
DI-4799-S	"Instructions to Design Engineers for Use of HW-4799-S"
DI-4680-S	"Instructions to Design Engineers for Use of HW-4680-S" (supersedes D-1-C)
DI-5722-S	"Instructions to Design Engineers for Use of HW-5722-S" (supersedes DI-4-C)
HW-4798-S	"Standard Specification for Forming, Placing, Finishing and Curing of Portland Cement Concrete", Rev. 2
HW-4799-S	"Standard Specification for Batching and Delivery of Concrete", Rev. 2

Work on standards and studies during the month is as follows:

- a. Work on new standards for instrument symbols continued and two of the standards are 90% complete.
- b. Revisions to design guides on Process and Service Piping, and on Valves and Valve Equivalents were each advanced 60% during the month to 90% complete.
- c. Revision of the design guide on heating ventilating and air conditioning is now 60% complete.
- d. Work on developing a design guide for welding of miscellaneous metals and alloys was advanced 5% during the month to 70% complete.
- e. Preparation of standard design criteria is as follows: electrical sections, 70% complete; plant telephone system, 50% complete; auxiliary signaling and communications, 40% complete.
- f. Work on HWS-5766-S "Standard Specification for Radiographic Spot Examination of Welded Joints" is 80% complete, an advance of 5% during the month.
- g. Testing of protective coatings for effluent lines and retention basins continued with samples entered during the month into the 100-H Retention Basin and into the Hot Water Testing Tanks.
- h. The report "Treatment of Wood Containers to Resist Fire" HW-33023 was completed and issued during the month.
- i. Other items studied were cathodic protection, concrete anchors for guying posts and use of plastic dotted-line floor markers.

DECLASSIFIED

DESIGN PROJECTSStatistics:

Design engineering and drafting effort of the Section on projects for the month of September was expended in the following categories:

	<u>Engineering</u>		<u>Drafting</u>	
	<u>Man Months</u>	<u>% of Total</u>	<u>Man Months</u>	<u>% of Total</u>
1952 Expansion Program	33.2	32.9	13.8	17.3
4-X Program	9.1	9.0	1.5	1.9
Reactor Plant Modification for Increased Production	26.6	26.4	225.6	32.2
1706-KEE	5.2	5.1	8.9	11.2
Other Design Projects	9.8	9.7	3.6	4.6
Miscellaneous Design Orders	<u>17.1</u>	<u>16.9</u>	<u>26.1</u>	<u>32.8</u>
	101.0*	100.0	79.5*	100.0

\* Equivalent man months includes 1.9 man months of engineering and 0.4 man months of drafting overtime.

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.

Design of the 1706-KE Recirculation Facilities was advanced 12% during the month to 40% complete. Of the 126 required drawings, 11 are in the check print stage, 39 have been issued for comment, and 8 were issued for approval. The high pressure pump to be used in the loop will be a canned rotor type because the pumps with mechanical seals will not be guaranteed at present leakage requirements. Changes in the scope include installation of one carbon steel loop in place of one of the four stainless steel loops.

CA-513 - Purex Separations Facility

Design of the revisions to the condenser design for the Purex Tank Farm is 98% complete, an increase of 1% during the month. Design of the new proportional sampling equipment was started.

CA-514 - 300 Area Expansion

Design of the 300 Area Expansion Program was advanced 2% during the month to 96% complete. Work concerned with the conversion of the 3706 Building to first aid and office occupancy is 90% complete, an advance of 35% during the month. Mechanical and electrical design of the ultrasonic bond test equipment was stopped at the request of the Project Section.

CA-535 - Redox Capacity Increase, Phase II

Detail design of Redox Capacity Increase, Phase II, remains at 99% complete because of the addition of seven jumper drawings to the scope of the work. These drawings were completed during the month and remaining work consists of two or three minor detail drawings.

CG-558 - Reactor Plant Modification for Increased Production

Total design on Reactor Plant Modification for Increased Production is 38.5% complete, an increase of 7.7% during the month. Detail and scope design were advanced 8.3% and 3.3%, respectively, during the month to 33.1% and 87.0% complete. Design work on back-up instrumentation was discontinued and the affected drawings will not be included in progress calculations.

All design except for ventilation is complete for the 181-B and C Buildings. The electrical and structural design drawings have been issued for comment and the mechanical design is complete. Design of the raw water line between 181-B and 182-B is complete; design of the line between 181-D and 182-D was started. Work continued on design of the 183-B and D Buildings.

Preliminary structural design was started on the 190-F Building. Design of the 190-B, DR and D Buildings continued with the mechanical design being approximately 70% complete in each case. A plan which would eliminate the basement was rejected because of inadequate space for auxiliary equipment.

Mechanical design for the 105-B, D and DR Buildings was advanced 15%, 20% and 10%, respectively, during the month to 95%, 50%, and 60% complete. Work was started on electrical and instrument design.

Procurement specifications were issued for sluice gates for the 100-B, D, and DR effluent systems, shielded cable for the 181-D Building, outdoor sub-station equipment for the 151-D Building and replacement pressure monitor gages. The delay in placing orders and the resultant lack of vendor information is delaying electrical detail design.

CG-562 - Waste Metal Recovery Plant Modifications

Mechanical design of the Waste Metal Recovery Plant Modifications to permit series operation was advanced 40% during the month to 90% complete. Eleven drawings were completed during the month. Total design for the project is approximately 90% complete.

CG-574 - Hanford 3-X Program - Irradiation

The design criteria for the Hanford 3-X Program - Irradiation, was approved by the project representatives. Detail design is approximately 21% complete.

CG-578 - Effluent Water Monitoring Improvements, 100-B, D, DR, F and H Areas

Design of the Effluent Water Monitoring Improvements, 100-B, D, DR, F and H Areas was advanced 6% during the month to 37% complete. Fifteen drawings are approved for design, six drawings are issued for formal comment and nine drawings are in the check print stage.

1215355

DECLASSIFIED

HW-33200-D-3

Design Section

CG-588 - Ammonia Scrubbers, Redox

Design for the Redox Ammonia Scrubbers is 90% complete, an advance of 15% during the month. Six drawings on the proportional sampling facilities were completed making a total of 24 drawings completed out of 26 required drawings.

CG-597 - Hanford 3-X Program - 200 and 300 Areas

A scope document covering all the firm items for the reactivation of the bismuth phosphate separations plant in the 200-E Area was prepared and approved by the Project Representatives Group. A Part II document covering the final scoping phases for this job is scheduled for issue about November 1, 1954. Work was started on the advance ordering of approximately \$300,000 worth of critical materials and preparation of several detail drawings for vessels and equipment.

Preliminary study was continued on three alternatives to provide additional capacity for the UO<sub>2</sub> Plant when the total requirements of the 4-X Program exceed the present capacity of the plant.. The three alternatives consist of shipping UNH off-site, expanding the existing UO<sub>2</sub> facility, or constructing a new plant. Further information is being assembled about these alternatives for consideration and determination of which shall be followed.

Initial scope work was begun on the 300 Area phase of the program.

A preliminary Project Proposal was prepared and funds were authorized by the A.E.C. for initiation of work at B Plant. This work is aimed particularly at activation of specific items of equipment so that operability tests may be made.

CG-598 - Purex Vacuum Fractionator

Authorization was received during the month for design of facilities for the vacuum-fractionating of nitric acid that will be recovered from the Purex operation. This does not include detail design of the fractionator. It appears that 47 design drawings will be required in addition to the fabrication vendor's design.

CG-599 - Hanford 4-X Program - 100 Area

Work was continued on the preparation of a scope document for items required to provide adequate inter-area handling equipment in connection with the 4-X Program - 100 Area. Detail design was started during the month.

CG-603 - Hanford 4-X Program - Third Extraction Cycle "T" Plant

Detail design was started during the month on the third cycle of the "T" Plant in connection with the 4-X Program.

D.O. 100549 - Redox Back-Cycle (CG-187-D-II)

Design on the Redox Back-Cycle was advanced 10% during the month to 80% complete. Five drawings were completed during the month while fourteen additional jumper drawings remain to be completed.

121535b

D.O. 100748 - 230 KV Transmission Line

Revision of the project proposal for the First Capacity Increase - 230 KV System is proceeding to conform to agreements reached with the A.E.C. during the month. The project proposal which will be resubmitted will include other minor changes since it was originally submitted March 26, 1954.

D.O. 100754 - Modification of the 189-D Process Tube Mock-Up

Design of the modification of the 189-D Process Tube Mock-Up is approximately 65% complete, an advance of 5% 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 42% complete, an increase of 2% during the month. Six additional drawings were started, making a total of 205 drawings started out of 400 drawings required.

D.O. 100825 - Silica Gel Tail-End Treatment - Redox Phase II (CG-535)

Design of the Redox Silica Gel Tail-End Treatment facility was advanced 10% during the month to 85% complete. Of 53 required drawings, 25 drawings are out for comment and 13 drawings were approved during the month to make a total of 19 approved drawings. The scope of the work was increased by items such as mock-up dunnage for the neutralizing tank, lifting yoke, etc.

D.O. 100889 - Project Proposal, Additional Records Storage Facilities - 712 Bldg.

The preparation of a project proposal for construction of an addition to the existing Records Service Center was completed and all approvals were essentially completed. The proposal is scheduled to be forwarded to the Financial Department the first week in October.

D.O. 100930 - Graphite Hot Shop and Storage Facility - 3730 Bldg.

Detail design of the renovation and addition to Building 3730 as a hot shop is approximately 60% complete, an advance of 35% during the month.

D.O. 100946 - Foxboro Dewcell Moisture Monitoring System (CG-583)

Detail design of a gas moisture detection system for the 100 Areas was advanced 10% during the month to 30% complete. The specification for segmental recorders was approved and drawings for 100-DR are ready for issue.

D.O. 100963 - Floor Loading Stress Survey, 325<sup>th</sup> Building

Checking the floor structure for proposed loadings in various rooms of the 325 Building is 60% complete, an advance of 45% during the month.

D.O. 101003 - Storage Basin Cleaners

Design of cleaning equipment for storage basins and the operating instructions were completed and forwarded to the Manufacturing Department.

1215357

D.O. 101015 - Dejacketing and Ultrasonics Equipment, 105-C Bldg. (CG-589)

Design of a slug stripper and ultrasonic grain size determinator was advanced to 24% complete. Of 22 required drawings, 8 are in the check print stage.

D.O. 101023 - Fuel Element Pilot Plant (CG-546)

Preparation of a scope drawing for project proposal revision purposes for the fuel element pilot plant was completed. A new scope layout for the electroplating room is being prepared.

D.O. 101035 - Installation of Car Pullers, 100-B, D, F and H Areas

Design for the installation of car pullers was advanced to 50% complete. Construction work will be performed by a lump sum contractor.

D.O. 101039 - H-4 Oxidizer Redesign

Detail design was advanced to 65% complete based on the scope consisting of a vessel and a special heating coil. Two drawings are in the checking stage.

D.O. 101041 - Additional Air-Drying Facilities - Building 234-5

The preparation of a project proposal for additional air-drying facilities for the 234-5 Building was stopped at the request of the Manufacturing Department to allow their personnel more time to study the problem and provide more adequate justification.

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 to 23.6% complete. Two drawings and the specification for the television chain, with its associated equipment, were issued for comment.

D.O. 101050 - Redox Crane Viewing Room

The project proposal for a Redox crane viewing room was completed and is being routed for approval. The total estimated project cost is \$21,000.

D.O. 101051 - Additional Helium Storage Facilities - Building 234-5

Preliminary scope design was started and an analysis of operating and capital costs, on five different alternates, was completed for additional inert gas storage facilities at the 234-5 Building. After an alternate is selected and scoping is completed, a project proposal will be prepared.

D.O. 101052 - Redox Stack Sampler - Project Proposal

Scoping was started on a Redox stack sampler and is expected to be completed next month, after which a project proposal will be prepared.

D.O. 101058 - Check Valves - Building 190 Steam Lines

Work was started during the month and a proposed draft and sketches for each area were prepared. Work was stopped at the end of the month based on the Development Representatives Meeting of 9-24-54, in which it could not be unanimously agreed that these valves were required to be installed.

D.O. 101062 - HNO<sub>3</sub> Decontamination Facilities - 100 Areas - Project Proposal

Preliminary design was started on an installation of facilities in all 100 Areas which will permit the use of nitric acid as a decontamination agent used in dummy decontamination operations.

D.O. 101065 - Addition to 200-W Fire Station, Building 2709-W

Preliminary architectural design was started for the proposed addition to the 200-W Area Fire Station.

DESIGN SECTION WORK COMPLETED DURING SEPTEMBER

- D.O. 100852 - Cement Pad for Grain Storage Bin, 100-F
- D.O. 100878 - Preparation of Bid Set Maps
- D.O. 100887 - Redox Production Facilities (CA-187-D-III)
- D.O. 100944 - H-1 Agitator Flexible Jumper
- D.O. 101004 - Flexible Electrical Jumper
- D.O. 101012 - Auxiliary 10 Ton Hook, 202-S

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. 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.

*R. B. Beaton*  
Manager, Design  
ENGINEERING DEPARTMENT

**DECLASSIFIED**

DESIGN SECTION WORK STATUS

ENGINEERING MAN MONTHS  
PROCESS ENGINEERING SUB-SECTION

Description	Backlog Start of Mo.	Work Sched dur. Mo.	Time Spent dur. Month	% of Total Effort	Backlog End of Month	Scheduled FY 1955					Bal. FY 55 Total	
						Oct.	Nov.	Dec.	Jan.	Feb.		Mar.
Exp. Program****	89.6	12.9	19.7	76.7	12	11	10	9	8	6	20.7	76.7
CG-558	23.9	4.3	6.5	19.6	4	4	3	3	3	2	0.6	19.6
CG-598		3.0		3.0	.5	.5	.5	.5	.5	.5		3.0
4-X Program	209.5*	75.0	1.6	73.4	3.5	4.5	6.5	6.5	6.5	6.5	39.4	73.4
Reactor D&D	182.2*	19.2	29.2	190.3	20	20	20	21	21	23	65.3	190.3
Sep. D&D	45.6	19.9	30.3	162.3	18	18	17	17	18	18	56.3	162.3
Met. D&D	15.6	2.9	4.4	42.7	3	3	3	3	3	3	24.7	42.7
234-5 D&D	9.3	1.4	2.1	14.2	1.5	1.5	1.5	1.5	1.5	1.5	5.2	14.2
Weapons D&D	28.2	0.3	.5	9.0	.5	.5	.5	.5	.5	.5	6.0	9.0
Other Projects & Design**		3.2	4.9	26.0	2	2	2	2	2	2	14.0	26.0
Anticipated Future Work											6.0	11.0
TOTALS	603.9	79.0	65.7	617.2	65	65	65	65	65	65	238.2	628.2

DESIGN ENGINEERING SUB-SECTION

Description	Backlog Start of Mo.	Work Sched dur. Mo.	Time Spent dur. Month	% of Total Effort	Backlog End of Month	Scheduled FY 1955					Bal. FY 55 Total	
						Oct.	Nov.	Dec.	Jan.	Feb.		Mar.
Exp. Program****	111.6	23.4	29.4	88.2	20	17	14	9	8	5	15.2	88.2
CG-558	203	20.1	25.3	182.9	20	20	20	20	20	20	62.9	182.9
CG-578 & 579	17.6	1.1	1.4	16.5	2	3	3	1	1	1	5.5	16.5
CG-598		4.0		40.0	4	6	9	9	7	3	2.0	40.0
4-X Program		28	4.3	23.7	5	5	5	5	4			23.7
D&D Programs	111.5	11.6	14.6	99.9	11	11	11	11	11	11	33.9	99.9
Other Major Projects**	139.5	18.8	18.1	143.9	14	12	12	12	11	10	72.9	143.9
Minor Projs. & Des. Orders	52.5	4.1	5.8	52.0	4	4	4	4	4	4	28.0	52.0
Anticipated Future Work											75.0	128.0
TOTALS	635.7	90.9	79.5	647.1	80	80	80	80	80	80	295.4	775.1

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

Authorized Projects	Anticipated Future	Totals
FY 55	FY 55	
116	24	140
201	44	245
118	21	139
154	28	182
58	11	69
647	128	775

\* Separations & Reactor Design Development Backlog Adjusted  
 \*\* Adjusted Backlog to Exclude 4-X Program  
 \*\*\* Previously charged to 1952 Expansion Program  
 \*\*\*\* Includes 1706 KE Recirculation Facility

**DECLASSIFIED**

HW-33200

DEL

MONTHLY NARRATIVE REPORT - SEPTEMBER, 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Following is a summary of personnel changes in Project Section during the month:

	<u>August 31, 1954</u>	<u>September 30, 1954</u>	<u>Net Change</u>
Employees on Payroll	416	411	-5
Tech. Grad. - Rotational	8	5	-3

The end-of-month status involved these changes:

	<u>Project Section</u>	<u>Tech. Grad. - Rotational</u>
Payroll Additions	6	
Payroll Removals	9	
Transfers into Section	3	
Transfers from Section	5	3
Transfers within Section	3	

B. SCOPE OF ACTIVITIES

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

<u>Project No.</u>	<u>Title</u>	<u>Completion</u>	
		<u>Scheduled</u>	<u>Actual</u>
CG-496	Recuplex	81%	75%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	98.7
	Reactor and Building	100	99.3
	KE - Water Plant	100	91.3
	Reactor and Building	94	87
	General Facilities	97	91.3
CA-513	Purex Facilities, Part "A"	85	73
	Part "D"	88	97
CA-514	300 Area Expansion	60	64
CG-535	Redox Capacity Increase, Phase II	80	76
CA-546	Fuel Element Pilot Plant	51	30

C. CRAFT LABOR

Blaw-Knox carpenters, who had been on strike since August 13, 1954, returned to work at the Purex site on September 2, 1954. Millwrights have continued to

1215361

protest the assignment of machinists to current work in 2101-M Building; however, current complaints have not been serious. A labor dispute concerning craft affiliation arose between pipefitters assigned to 300 Area Expansion and pipefitters employed by a vendor. This comparatively minor dispute has not been settled.

#### D. SAFETY AND SECURITY

There were no security violations by Project Section personnel during the month. Nine regular meetings for discussion of safety, security, and health topics were attended by about 295 G.E. personnel. Four Monday morning tool box meetings and three mass safety-security meetings were conducted in the field for service contractor personnel. Safety and Special Hazards Orientations were given to 59 new and re-hired contractor employees.

#### E. HIGHLIGHTS

##### Minor Projects Sub-Section

Work was done on 46 project items, three informal requests, and miscellaneous work orders representing total authorized funds of \$40,958,640. The Sub-Section completed assigned work on CA-539, Redox 241-SX Tank Farm; CG-563, Modifications of 314 Building; IR-178, Substation - 189-D Building; and two engineering requests. Five project proposals were approved by the General Electric Company. Eight authorizations were granted by the AEC. The Sub-Section accepted initial assignment of work on one project and one engineering request. The warehouse service for Minor Construction Miscellaneous Stores now includes about 60% of the store stock material formerly stored and controlled by Kaiser Engineers. Three major items, electrical equipment, protective clothing, and small tools, are yet to be received. 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 Modifications, and Hanford 4X Program.

##### Project Auxiliaries Sub-Section

By completion of 310 orders, Inspection Unit sharply reduced the number of orders requiring inspection to 780. The number of new orders which will require inspection remained about level at 98. Samples evaluated under the Corrosion Testing Program dropped to 258, a reduction of 27% from the previous month. Reproduction output was 442,531 square feet, an increase of about 23% from the August total. Estimating completed 22 estimates, of which 10 were for project proposals. Field Surveys continued routine survey and testing work at Hanford and Richland, and also completed assistance to vendor inspectors at the Purex vessel vendor's plant. The Reproduction and Engineering Files Unit instituted a new procedure for security protection of classified drawings during transmittal.

##### Reactor Projects Sub-Section

At 2101-M Building, production was begun on graphite to be machined for the Physical Constants Test Reactor, and completion was estimated at about October 31,

DECLASSIFIED

HW-33200 JEL

1954. Acceptance testing of 105-KW Reactor and Building progressed to 34% complete. Preparations were completed for parts of the dynamic flow test concerned with raw water back-up, and acceptance testing for service water back-up was begun. The process water system for 105-KW has been tested under low pressure in final preparation for the dynamic flow test. For 105-KW Reactor final repairs and adjustments are being made on both rod systems. The Ball Third Safety System is being given final adjustments and tests, as are all electrical and instrument systems. At 105-KE Building the front face hydrostatic test and acceptance testing of air systems began late in the month. The 24" cross-tie line has passed a flow test of 40,000 gpm. Delivery of a new secondary pump bowl casting has been promised for early October, 1954. Two more complete castings and two halves have been shipped from Oakland, California, to Portland, Oregon, for finishing. The 100-K railroad was completed during early September, and subcontracts were completed by the Steel Construction Company and Midwest Piping, Inc.

#### Separations Projects Sub-Section

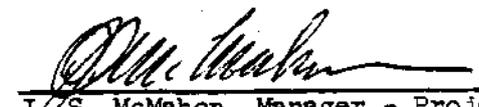
Work on CA-539, Additional Waste Storage Facilities for Redox, was completed, and the facility was accepted September 8, 1954. Design work for Purex was essentially completed, and design changes were processed to accomplish repair of five process concentrators which were found to contain inadequate welds. The first sets of certified drawings of the color TV have been received. Construction of the 202-A Building was reported by the contractor as 71% complete. Miscellaneous small placements of concrete were made, and concrete cover blocks were completed. Amercoat painting was completed through Cell "E", and the stainless steel liner in the Decontamination Cell was essentially completed. Installation of piping in the Hot Pipe Trench progressed to about 88% complete. Lines in all galleries are being tested and flushed. Installation of tanks in Cell "D" and in Acid Storage was completed about mid-September. Eight sections of the 291-A Stack liner were installed. Equipment placement in 202-A Building included nine vessels in the Canyon, three vessels in the Service Area, and eight agitators in the Service Section. Electrical and instrument work consisted of connecting testing, and checking. Additions to Filter Plant and Power Plant have progressed to the stage of final testing.

#### 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

September 30, 1954

  
J. S. McMahon, Manager - Projects

## II. STATISTICAL AND GENERAL

### A. SIGNIFICANT ASSIGNMENTS

#### 1. Initial Reporting

##### CA-596 - Central Mask Washing Station - Building 2723-W Separations

Preliminary design was about 15% complete. Design was authorized by AEC on September 9, 1954. Detailed design is to be started during October, 1954.

##### ER A-766 - Liquid Waste Disposal Facilities, Building 108-F

The Radiological Sciences Department has written a work order for preparation of the informal request to provide liquid waste disposal facilities for the Biological Laboratory in 108-F.

#### 2. Final Reporting

##### CA-539 - Additional Waste Storage for Redox

Construction progressed 1% to completion. The facility was accepted September 8, 1954.

##### CG-563 - Modification to 314 Building and Installation of Electroplating Pilot Plant

Construction progressed 20% to completion, and the project is being closed out with one exception, installation of two stainless steel sinks.

##### IR-178 - 440 Volt Substation - 189-D Building

All work has been completed, and information is being assembled for issuance of the Physical Completion Notice.

##### ER A-1214 - Scope Work to Install Steam Vent in 189-D Building

The estimated cost for this work is \$2050, and Technical Section will install the vent system on a work order basis. The engineering request is being closed out.

##### ER A-1215 - Study, Heating No. 1 and No. 2 Warehouses - White Bluffs

The study has been completed, and the study report was sent to the Minor Construction Management Unit for final disposition. The engineering request has been closed out.

#### 3. Current Projects

##### CG-496 - Recuplex Installation - Building 234-5

Design has been completed previously; over-all construction progressed 9% to a total of 75%. The completion percentage for lump sum work was revised to 98%

1215364

DECLASSIFIED

HW-33200

to include work done by the U. S. Geological Surveys. The project proposal is being revised to obtain additional funds by October 17, 1954. This revision was necessitated primarily by the determination that 11 vessels require alterations in order to make them "safe" from the critical mass aspect.

The remaining process valves and the re-generative turbine pumps have been received; however, the Chem pumps are not expected to arrive until the first part of December, 1954, and they are the critical order concerning start-up.

#### CA-512 - 100-K Reactor Facilities

##### 100-KW and 100-KE Water Plants

Over-all design of water plants remained at 99.8% complete. Construction progress was as follows: KW progressed .8% to a total of 98.7%; KE progressed 3.5% to a total of 91.3%; general facilities were 91.3% complete.

At 181-KW River Pump House, acceptance tests have been started, and minor exceptions are being cleared during Acceptance Test Procedures. Load tests have been run on the turbo-generators in 165-KW Building. Process water flow meters were calibrated. Acceptance tests of the electrical switchgear are 95% complete. At 190-KW Process Pump House, acceptance testing, and inspections of the building and equipment were completed. The manufacturer is determining the causes of excessive oscillation of the rotor of motor No. 6. The 183-KW Filter Plant is now furnishing accurately controlled process water for the Dynamic Flow Test (ATP-1308). Thus, the water plant equipment is ready for the full-pressure tests of 105-KW.

Progress toward completion of other facilities was good. Automatic operation of the 107 valves has been tested satisfactorily with dry tanks. Items of equipment for the bus modification in 151-KW Substation have been shipped. Portions of the telephone and fire alarm systems have been tested. Area grading, roads, and fences are being accomplished. The 1700 Buildings have been inspected, and exceptions are being cleared.

Work in 100-KE Water Plant buildings consisted of testing and final adjustment. Heat runs of the motors of river pumps 3, 4, and 5 have been made. Boilers, turbines, and valve pit piping in 165-KE Building are being installed and checked. Acceptance tests of electrical switchgear were 50% complete. Two low lift pumps are installed in 190-KE Building, and they are in operating condition as are the temporary high lift pumps which they serve.

Delivery of the first new castings for the 190-KE high lift pumps was promised for early October, 1954. Two more complete castings and two halves have been shipped from a foundry in Oakland, California, to the vendor in Portland, Oregon, for final welding and machining.

Electrical switchgear for Building 1706-K was received and set in place. The roof deck and siding are being installed. Installation of pipe, vent ducts, and conduit was continued throughout the building. Concrete was placed for the tunnel escape hatch.

1215365

### 105-KW and 105-KE Reactor Facilities

Construction progress on the 105-K Reactors was as follows: KW progressed .9% to a total of 99.3%; KE progressed 5.6% to a total of 87%. Numerous concrete placements were made for such items as retaining walls, sidewalks, ramps, blockouts, and storage mats. Repairs and finishing work were accomplished on the buildings and furnishings. Partitions were being installed, and painting was being finished where possible.

The process water system to 105-KW was continued under low pressure while connections were being tightened in preparation for the Dynamic Flow Test. All lines for both reactors are being flushed, and the 24" cross-tie line has been given a successful flow test at 40,000 gallons per minute. The steam lines in 105-KW have been successfully tested.

Extensive testing was accomplished on heating and ventilating systems, electrical and communication systems, and instrumentation. The Pressure Monitoring System was tested on the basis of a Design Letter requesting that the requirement be relaxed to 300 psi, since that is the rating for the toggle valves which have been causing considerable difficulty. Another Design Letter has been issued changing the arrangement of three of the four channels in the Process Monitoring System.

Both rod systems for 105-KW Reactor are being given final repairs and adjustments. These repairs included cleaning of all vertical safety rod assemblies to remove foreign matter which was discovered during testing. Of the horizontal control rods, 15 have been satisfactorily tested pneumatically at 50 psig. The Ball Third Safety System is likewise being given final cleaning, testing, and adjustment. Crossheader assemblies were accepted at 125 psig on September 24, 1954.

The over-all acceptance testing of 105-KW Reactor was 34% complete, and for 105-KE Reactor 13% complete.

Miscellaneous concrete placements were made in 105-KE Building and associated structures. Partitions are being installed, and finishing work is being done where possible. Communication equipment is being placed and connected, and motors with the control system are being prepared for final acceptance.

At 105-KW Reactor, the front fact hydrostatic test, the acceptance testing of air systems, and the preliminary gas test in 115-KE Building began during the week ending September 24. Flushing was completed through inlet risers, crossheaders, and charging flow riser.

Horizontal control rod drives were run-in and inspected. The vertical safety rod cylinders were aligned, and connected with air piping and control circuits. Additional work was done on the control system and equipment for the Ball Third Safety System.

Work was continued on installation and testing of all instrument systems. Acceptance Test Procedure tests are scheduled to begin during early October, 1954.

1215366

DECLASSIFIED

DECLASSIFIED

HW-33200-TEL

CA-513 - Purex Facility, Part "A"

The design phases of CA-513, Parts "A", "B", and "C", were essentially completed. Construction progressed 10.3% to a total of 73.2%

Design changes were processed to accomplish repair of five process concentrators which were found to include welds which did not have full penetration. Design has been initiated for ammonia scrubbers in Dissolver Cells "A", "B", and "C" of the 202-A Building. The first sets of certified drawings for the color TV have been received from the vendor.

Construction of the 202-A Building was reported by the contractor as 71% complete. An Amercoat painting was completed through Cell "E" and was continued within the other cells. Installation of the stainless steel liner in the Decontamination Cell was essentially completed. Miscellaneous small placements of concrete were made, and equipment base plates were being placed in the cells. The concrete cover blocks were completed.

Installation of piping in the Hot Pipe Trench was about 88% complete. Testing and flushing of pipe lines were continued in all galleries. Process piping was being installed in Aqueous Make-Up, Analytical Laboratory, and Acid Storage areas.

Electrical work consisted of installation, testing, and adjusting in all parts of the building. Equipment and switchgear and laboratory hoods are being prepared for acceptance testing.

Heating and ventilating equipment installation was continued. In the Canyon, supply was 84% complete, and exhaust 71%. The Service Area systems were about 85% complete. Assembling and installation of fume hoods began on September 17.

Instrumentation work included connecting tubes to control panels, testing of valves, and mounting instruments. General Electric instrument technicians have completed testing of all electric rotameters. Installation of major equipment was made as soon as the vessels were processed through the Mock-Up Shop. The following classes of equipment were placed: nine vessels in the Canyon, three vessels in the Service Area, and eight agitators in the Service Section. All Cell "D" and all Acid Storage vessels are installed.

In 203-A Storage, erection of the stainless steel tanks was essentially completed. The nitric pipe trench was complete and piping was being installed.

At 211-A Chemical Tank Farm, roof plates on tanks No. 20 and No. 21 have been welded. Installation of siding and insulation was essentially complete. Process piping and electrical services are being installed.

The first shipment of the stainless steel liners for 291-A Stack have been received, and installation was begun on September 14. To date, eight sections which comprise 135 feet of the required 208 feet have been installed. Progress of lump sum contractors has improved. The last of the parts required for 283-E

1215367

Fg-8

Filter Plant Addition were received by air express and have been installed. Final testing can begin as soon as the new 1000 gpm pumps have been adjusted for satisfactory operation. The No. 1 Clearwell was put into service on September 27. New sprockets were ordered to replace faulty ones on the flocculator drives.

The 284-E Power Plant Addition was essentially completed. The No. 5 Boiler was tested under full load about the middle of the month, but the bearings must be replaced on the water pump turbine. The No. 4 Boiler was given the four-hour capacity test on September 23, 1954. The coal conveyor system has functioned satisfactorily except for minor adjustments.

At 241-A Tank Farm, the tank domes are being placed. Backfilling of the tank area was continued and the encasement from 202-A Building to the tank farm was ready for backfill. Craftsmen continued fabrication of piping for vapor headers, encasements, and lines to the CR Tank Farm.

#### CA-513-D - Hot Semiworks Conversion

Design had been completed previously; construction progressed 12% to a total of 97%. All construction and testing in the 201-C and 271-C Buildings was completed, and the architectural work on the waste concentrator control building was completed. The concentrator vessel has been set in place and is being connected. The vault piping was 30% complete.

#### CA-514 - 300 Area Expansion Program - Production Facilities

Design completion status remained at 99%; construction progressed 6% to an over-all total of 64%.

Heating and ventilating systems in 313 Building Addition have been given final acceptance tests. Telephone connections have been installed. The steam line mains have been installed to the heating and ventilating units.

Equipment installations accepted by Manufacturing Department included nine Ajax induction furnaces, the fluoroscope on the first finishing line, and the exhaust system from the furnace pit. Installation of equipment during the month included eight new autoclaves, the No. 1 cut-off machine, the welding machine, pipe for the vacuum system, and the centralized air station Z.

Renovation of 3707-A Building has been completed with the exception of patrol headquarters which must await assignment of office space in 3706 Building.

#### CG-535 - Redox Capacity Increase, Phase II

Design progressed 1% to a total of 99%; construction progressed 3% to a total of 76% as compared to scheduled completion of 81%. The architect-engineer portion of design was completed; the General Electric design effort has been concentrated on the Silica Gel Facility. Installation of heating and ventilating equipment in 233-S Building was essentially completed, and all vessels received to date have been installed. The 204-S tanks were complete except for insulation

**DECLASSIFIED**

HW-33200 TEL

of piping and process piping tie-ins. Shop fabrication of mechanical equipment for 233-S Building was approaching completion. The construction release for the 205-S Silica Gel Facility was being prepared.

CA-546 - Fuel Element Pilot Plant

Design progressed 1% to a total of 95%; construction progressed 8% to a total of 30%. A new preliminary arrangement plan is being prepared for the electroplating facilities. This plan is to be submitted to the architect-engineer with supporting information for preparation of installation drawings.

Purchase requisitions are being prepared for the semiworks equipment and are to be released as soon as procurement funds are available.

Progress has been slow, apparently because of lack of coordination among sub-contractors, vendors, and material procurement. The contractor is attempting to obtain an extension of the contract completion date and to justify all delaying factors.

CG-558 - Reactor Plant Modification for Increased Production

Work at 100-B Area consisted of installation of effluent liner and raising of block baffle wall at 107-B. Shop work and preliminary field work were continued. An access road to the outlet structure is being prepared for use by a lump sum contractor. In 100-DR Area the concrete retaining wall was placed on the north of 190-Building. Excavation for the north ramp was completed; and excavation was started for the sewer, manhole, septic tank, and tile field at the south end of the building. The new steam line structure was set. Minor Construction has been notified to proceed with tie-in work for the process tunnel.

The Design Section reviewed requirements for a basement in the 190-DR Annex.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 10% to a total of 70% as compared to scheduled completion of 97%. Construction progressed 4% to a total of 25% as compared with scheduled completion of 31%. A revised schedule is being prepared.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design of both phases had been completed previously; over-all construction progressed about 4% to a total of 95%. The contractor has been unable to obtain enough vehicles to haul rock fill for the crib; however, the existing crib is taking care of present process flows. A shutdown of the Redox Plant has been scheduled for October 12 to tie-in the new crib.

CA-431-C - Metal Examination Facility - 105-C

Design had been completed previously; construction progressed 7% to a total of 30%. Painting of the basins has been completed. Equipment is being tested in

1215369

the 300 Area. Installation of equipment and work on the monorail are to begin in early October, 1954.

CA-434 - New Bio-Assay Laboratory

Design had been completed previously. Revised specifications for hot plates have been sent out for bids. The gloved boxes have arrived and a work order for installation is being issued.

CA-441 - Solvent Building

Design had been completed previously; construction progressed 13% to a total of 55%. The roof coating has been applied. Other work was delayed because the contractor is still awaiting delivery of mechanical equipment.

CA-516 - Gable-Butte Railroad

Design had been completed previously; construction progressed 17% to a total of 99%. Old rails and ties have been removed, and work was completed except for establishing proper track grade at one location. This exception is being cleared, and final inspection has been scheduled for early October, 1954.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Design had been completed previously; construction progressed 27% to a total of 30%. The project proposal has been revised, but the revision was not approved by General Electric Company. However, a segregation of funds has been requested to permit more work by Plant Forces. The lump sum contractor arrived on the plant on September 10, 1954, and began work on the 200-E Area tank.

CA-533 - Hanford Works Official Telephone Exchange

Design had been completed previously; construction progressed 11% to an over-all completion of 20%. Wall masonry of the Telephone Exchange Building was essentially completed. The Soffit block support is being installed. The circuit drawings submitted by the equipment vendor have been commented upon by General Electric and transmitted to the AEC.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

With design completed, a final draft of the specifications was sent to AEC for approval.

CA-544 - Central Distribution Headquarters

With preliminary design about 15% complete, the project proposal is being routed for approval. A request is being made to use the existing White Bluffs Ice Plant as the Electrical Utility Headquarters.

DECLASSIFIED

**DECLASSIFIED**

HW-33200 DEL

CA-548 - Reactivate Project Proposal for New VSR Test Tower

With scoping completed, work on this project was delayed to allow File Technology Sub-Section time for gathering information necessary to justification of this project.

CG-549 - Activate Task I, RMA Line - Building 234-5

Design had been completed previously; construction progressed 10% to a total of 12%. Work was continued on installation of Task I electrical control equipment. Existing chemical addition lines are being altered, and new chemical addition lines are being installed. It now appears that delivery of hoods will approximate the dates promised by the fabricator; so Minor Construction work is being coordinated with these deliveries.

CG-551 - Expansion of 234-5 Building Facilities

Design had been completed previously; construction progressed 11% to a total of 63%. Electrical-instrumentation work was 90% complete. The fabrication of Task II control panels was progressing, and final checks are being made for start-up of the hood line in the shop. As-built information is being compiled for addition to tracings. The remaining work consists of installation of the ten sweep motors and completion of the lighting system.

CA-555 - Graphite Hot Shop and Storage Building

Design progressed 35% to a total of 60%. The advance authorization has been increased to \$15,000, and design is progressing on this basis.

CG-556 - X-Level Controlling and Recording Equipment

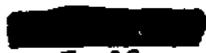
Design had been completed previously; construction progressed 16% to a total of 68%. A letter of revision requesting an extension of the physical completion date to January 1, 1955, was approved by AEC. Water and steam pipe on the x-levels has been installed. Instrument piping is being installed.

CG-562 - Waste Metal Recovery Plant Modifications

Design had been completed previously; construction was revised downward to 47% complete because of increased scope as stated in Revision No. 6 to the project proposal. A new schedule is being prepared. Work necessary for completion of series operation of the feed system has been completed. Work on intercycle stripping fabrication is to begin in early October, 1954.

CA-566 - Building for Prototype Physical Constants Test Reactor

Design had been completed previously; construction progressed 14% to a total of 20%. The contractor placed the building foundations during late September, 1954, and he is endeavoring to supply all materials and equipment in accordance with the specifications.



At 2101-M Building production was begun on the graphite to be machined for the test reactor. It is now believed that this work can be completed by October 31, 1954.

CG-572 - Particle Problem Animal Exposure Equipment

Completion status remained at design 100%, construction 1%. Revision No. 1 of the project proposal is still awaiting authorization by AEC. Based upon promised delivery dates, installation work on Phase I should begin during early October, 1954.

CG-573 - Hanford 3X Program - 300 Area

Design had been completed previously; construction progressed 1% to a total of 99%. Excessive flash is beginning to occur in the center of the pressed pieces. This is caused by the warping of the die inserts and/or the die sleeves. A study is being made to determine whether a change of material or a change in processing can eliminate the problem. There have been several failures of the pilot valve seals on the main control valves; so a sample seal has been sent to the valve manufacturer for appraisal.

CG-574 - Irradiation

Scoping and design are being managed by Design Section. The project scope has been prepared

DECLASSIFIED

HW-33200 DEL

CG-587 - TRP Waste Scavenging

Design had been completed previously; construction progressed 55% to an over-all completion of 63%. Three cribs were completed, and the 14" pipe line was installed with the exception of four valves. The electrical work was started. Work by Plant Forces progressed sufficiently to allow the start-up of scavenging operations during late September, 1954.

CG-588 - Ammonia Scrubbers, Redox

Scoping and design are being managed by Design Section. Fabrication of vessels and jumpers has been delayed until about November because of more urgent work in TRP, Redox, and "T" Plants.

CG-589 - De-jacketing and Ultrasonic Equipment - 105-C Building

Design progressed 22% to a total of 32%. Design criteria are complete. Construction funds were authorized by AEC on September 22, 1954.

CA-590 - Fly Ash Collection Equipment, Building 384

With preliminary design about 15% complete, the project proposal was returned, unapproved, by AEC. The Manufacturing Department is obtaining more information for justification.

CG-592 - Laboratory Supply Space, 3706 Building

Technical Section has requested that the project proposal be revised and resubmitted on the basis of this facility being located in either 3706 Building or 3702 Building.

CG-594 - 221-T Building Roof Repair

Design had been completed previously; construction progressed 17% to a total of 22%. Most of the old roof material has been removed, and new expansion joint seals are being installed.

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 50%. From experience of the 300 Area Power Unit with a similar puller, it was decided to use manila rope instead of marlin covered rope.

CG-597 - Hanford 4X Program - B & T Plants, UO<sub>2</sub>, and 300 Area

Revision No. 2 to the project proposal has been approved by the AEC. Preliminary testing and building rehabilitation work was started. Engineered materials are being ordered in advance.

For the portion of this project concerned with UO<sub>2</sub> Program, the Design Section is preparing an alternate proposal for obtaining additional capacity by late 1955. The most promising current proposal includes the addition of equipment to the existing UO<sub>2</sub> Plant.

1215373

Scoping of the 300 Area portion of the Hanford 4X Program was continued.

CG-599 - Hanford 4X Program - 100 Area

In fulfilling its responsibility for design, Design Section is studying the feasibility of a bucket with a greater capacity than the ones now being used. The number of buckets needed for this project has been established.

CA-601 - 300 Area General Improvement Program

With preliminary design 80% complete, the project proposal was submitted to the Commission on September 1, 1954.

CG-602 - Remote Sampling - Hot Semiworks

With design 5% complete, the project proposal was authorized by AEC on September 9, 1954. Purchase requisitions have been issued for advanced procurement of materials.

CG-603 - Hanford 4X Program - Third Extraction Cycle "T" Plant

Field work was started during early September, 1954, and progressed to about 25% complete. This consisted of testing lines and equipment and other miscellaneous work to determine the condition of the components of the "T" Plant. Design Section is preparing a project proposal to include the reactivation of "B" Plant in the scope of work.

CG-605 - Installation of Additional Generating Capacity - 189-D

Field work was about 4% complete, and consisted of work on the generator pad and appurtenances.

IR-181 - Temperature Control Improvement - 108-F Building

Design had been completed previously. A work order was issued to Plant Forces for procurement of miscellaneous material and installation of coils and piping. No installation work was accomplished.

\*\*\*\*\*

The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month.

ER A-755 - Study of Classified Scrap Disposal Problem - 300 Area Library

The informal request is being rewritten on the basis of construction by a lump sum contractor.

ER A-758 - Mechanical Maintenance Shop Centralization - 100 Areas

With preliminary design completed, the project proposal was recalled by Manufacturing Department for further study.

DECLASSIFIED

HW-33200

ER A-761 - Decontamination Facilities, First Aid Station - 100-H and 200-W Areas

Work was delayed because of other higher priority work.

ER A-763 - Mobile Laboratory

With preliminary design completed, the project proposal is being routed for approval.

ER A-764 - Fire Station Addition

With preliminary design 80% complete, the project proposal is being prepared. It is contemplated that the temporary annex to the 2709-W Fire Station will be replaced with a permanent addition to the building.

ER A-765 - Painting Water Plant Structures - 100-DR Area

A preliminary study of the condition of the structures has been made, and further study is being made.

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 completed, the Plant Engineering Sub-Section is reviewing the project proposal to determine what items should be deleted from the present scope.

ER A-2751 - Removal of Task I and II R.G. Line

The rough draft of the project proposal is being reviewed by Manufacturing Department

ER A-3107 - Hanford Works Laboratory Exceptions

Work Orders EE-6176 and EE-6207 were closed out during the month.

ER A-3108 - Replacement of 313 Building Roof

The rough draft of the revised project proposal is being routed for preliminary approvals.

ER A-6022 - Replacement of 146-FR Raw Water Supply Line

The requested study was about 75% complete. The 6" pipe line has been uncovered at two points, inspected, and analyzed. This preliminary investigation indicates that the pipe line is still useable, and further investigations are being made to predict the expected life of the pipe line.

ER E-488 - Tocco Induction Heating Unit, 314 Building - 300 Area

The informal request was transmitted to AEC on September 13, 1954.

C. RELATED FUNCTIONS

The completion of 310 orders by vendor inspectors reduced the number of orders requiring inspection to 780. However, the remaining orders required detailed attention in the vendors plants, and a great deal of the work load shifted to office personnel at Hanford. Samples evaluated under the Corrosion Testing Program decreased 27% from the previous month, representing a total of 258 coupons evaluated during September, 1954. One inspector was assigned full time to the Purex project for liaison work.

Extensive inspection of the new castings for secondary pumps for 100-K Area was continued. For the Purex Facility, three concentrators and one fractionator were received in the mock-up shop. Twelve more Pfandler Tanks were shipped. The problem of repairing welded pipe which was returned to SWEPCO has not been satisfactorily solved. Eight pulse generators have been shipped with, however, some reworking of gears yet to be done.

In preparation for project CG-558 the vendor of sintered rings for horizontal rod components has experienced serious manufacturing problems, and a solution has not been discovered. Of the 34 aluminum extrusions which have been produced, only two have passed inspection.

Following is a resume of inspection activities during the month:

<u>Item</u>	<u>Number</u>
Total orders on hand requiring inspection	780
Cumulative number of orders assigned to inspectors	758
Number of orders assigned to inspectors this month	119
New orders received by Inspection during the month	98
Orders completed	310
Total requisitions for engineered equipment transmitted for Expansion Program	26
Total orders of engineered equipment placed for Expansion Program	66

At the end of September there had been grand totals of 3149 Expansion Program requisitions for engineered equipment transmitted, and 3162 placed.

Reproduction output increased about 23% from the previous month to a total of 442,534 square feet. The largest orders processed during the month were 5,083 prints for 100-K Area, 4503 prints for Reactor Modifications, and 1310 prints for 300 Area Expansion.

Estimating completed 22 estimates during the month. The completed estimates comprised the following: project proposal - 10, and scope - 12.

**DECLASSIFIED**

HW-33200

DEL

Field Surveys continued routine survey and inspection work in the manufacturing areas, Richland facilities, and Richland residential areas. This Unit completed assistance to the Inspection Unit on facilities being fabricated at New London, Connecticut.

D. CRAFT LABOR

Blaw-Knox carpenters, who had been on strike since August 13, 1954, returned to work at the Purex site on September 2, 1954.

Millwrights have continued to protest the assignment of machinists to current work in 2101-M Building; however, current complaints have been verbal and have not reached serious proportions. The assignment of machinists was believed to be quite proper both from the standpoint of contract obligations and from the necessity for extremely close tolerances of the machined pieces.

A labor dispute concerning craft affiliations arose between pipefitters assigned to 300 Area Expansion Program and pipefitters employed by a vendor. This comparatively minor dispute has not been settled.

REPORT OF VISITORS

To Hanford

None

Official Trips to Other Installations During September, 1954

R. J. Cavanaugh visited the following companies from the end of August, 1954, to September 20 for expediting and consulting on equipment for 300 Area Expansion: Udylite Corporation, Detroit, Michigan; Davies Supply & Manufacturing, St. Louis, Missouri; Panellit, Inc., Chicago, Illinois; and National Acme, Cleveland, Ohio.

R. C. Hollingshead visited Bird Machine Company, Boston, Massachusetts, from the end of August, 1954, to September 7 to witness equipment performance tests.

P. J. O'Neil visited the following companies in Seattle and Tacoma, Washington, from September 1 to September 3 to review engineering drawings and inspect equipment: Fryer-Knowles; Instrument Laboratory; Pacific Cerlikon; Marine Iron Works; Coates Electric; and Hydraulic Supply.

E. S. Davis visited Hansen, Van Winkle & Munning Company, Matawan, New Jersey, from September 1 to September 3 to review engineering details of electroplating facilities.

K. E. Kolb visited Van-Vetter, Inc., Seattle, Washington, on September 7 for clarification of drawings.

H. C. Copeland attended a meeting of the Instrument Society of America in Philadelphia, Pennsylvania, from September 14 to September 18 to observe instrument exposition and attend professional meetings.

1215377

[REDACTED]

L. J. Battey visited A.O. Smith Company, Milwaukee, Wisconsin, on September 16 for engineering approval of drawings.

M. G. Patrick visited Portland, Oregon, on September 23 and September 24 to attend a meeting of the American Society of Mechanical Engineers.

W. W. Walker visited the following companies from September 17 to September 22 for coordination of inspection activities: Steel & Alloy Tank, and Alloy Fabricators, Newark, New Jersey; Wyatt Metal & Boiler, Dallas, Texas; Carter Craft, Plano, Texas; and Standard Steel, Southwest Engineering, and A. O. Smith, Los Angeles, California.

K. E. Kolb visited Van-Vetter, Inc., Seattle, Washington, on September 21 and September 22 for drawing clarification; and on the same dates Mr. Kolb visited Penberthy Instrument Company, Seattle, Washington, to settle dispute over portion of a lead glass order rejected by General Electric Company.

**DECLASSIFIED**

**DECLASSIFIED**

MONTHLY REPORT  
ADVANCE ENGINEERING SECTION

SEPTEMBER, 1954

Fiscal year summaries of Engineering Department Research and Development Programs for Separations and for 234-5 were prepared during the month. General agreement was reached regarding outline, space allocation, and format for the Hanford Atomic Products Operation Annual Report.

Calculations of isotope yields during extended irradiation of uranium slugs up to burn-out of 75% of the U-235 were completed for natural uranium in lattices with three different conversion ratios. Additional calculations for enriched uranium and for loadings of thorium: uranium-235 are in progress.

A proposal that extended irradiation of thorium: uranium-235 slugs followed by separation of the uranium isotopes may be cheaper than production of low g/t plutonium for weapons purpose is being examined.



ADVANCE ENGINEERING  
ENGINEERING DEPARTMENT

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - SEPTEMBER, 1954

PERSONNEL PRACTICES SECTION

The number of applicants interviewed in September was 1,788 as compared with 2,051 for August. In addition, 135 new applicants applied by mail. Open, nonexempt, nontechnical requisitions totaled 340 at month end. One hundred employees were added to the roll and 153 removed during the month. Losses for the month included 86 who left to return to school, of which 28 had been engaged for temporary summer employment. Separations rate increased from .85% for fiscal month of August to 1.63% for fiscal month of September. These rates when converted to annual basis are 11.08% and 17% respectively. During September 56 new requests for transfer to other type work were received by Employment, and 40 transfers were effected. Attendance recognition awards were distributed to 134 employees in September, including 35 who qualified for four-year awards.

Six employees retired during the month and two employees died. Ninety-nine visits were made to employees confined to Kadlec Hospital, and 38 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 97.9%, in the Insurance Plan 99.2%, and the Employees Savings and Stock Bonus Plan 50.3%. At month end there were 823 registered under Selective Service and 795 military reservists were on the roll. Since August 1, 1950, 364 employees have terminated to enter military service, of which 120 have returned, 20 have not claimed re-employment rights, leaving 224 still in military-leave status.

A total of 83 new employees attended orientation meetings. Of this number, 92.7% have signed up to participate in the Pension Plan, 98.8% in the Insurance Plan, and 89.1% in the Good Neighbor Fund.

Fifty-two adopted suggestions were approved for awards in September, resulting in cash awards totaling \$890 with a total net savings of \$6349.32.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

The News Bureau issued 43 releases during the month. Two signed articles were submitted to national technical and trade magazines. Two articles were accepted for publication and four manuscripts were approved for release during the month. Hanford's contribution for the January issue of the GE REVIEW, which reviews last year's technical accomplishments within the Company, was completed and sent to the REVIEW.

The Operation 4S "Methods Improvement--Cost Reduction" program was launched during the month. Through the program, non-exempt employees are urged to seek out and submit as suggestions all cost reduction ideas they develop.

Four Management NEWS bulletins were developed and distributed to all exempt employees.

## EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS (Continued)

"Inside Hanford", a new weekly radio program, has been scheduled for broadcast at 6:00 PM on Thursdays, beginning October 14. Hanford Science Forum has been given 7:30 to 8:00 PM broadcast time on Mondays, beginning October 11.

"Hanford Vignettes", a fifteen-minute radio program based on interviews with employees who recalled conditions and experiences here ten years ago at the time of the start-up of the first reactor, was produced and first broadcasted locally. Copies of the show tape recordings were sent to radio stations throughout central Washington. Portions of the radio program were later used at 5:30 PM on the CBS "Sunday Desk" broadcast from San Francisco on October 3.

A total of 319 photographic assignments were completed this month, and 10,579 prints were produced.

## SALARY AND WAGE ADMINISTRATION

Preparations have been completed prior to conducting a selective salary survey with several companies in San Francisco and Los Angeles early in October. Work continues on the selection of suitable positions for survey in the northwest, and about twenty condensed position descriptions have been prepared to date.

Reimbursement Authorization No. 231 was received from the AEC covering revisions resulting from the GE-Union agreements of June 10, 1954. Reimbursement for the revised vacation plan was withheld at this time by the AEC, but we are assured approval will be forthcoming on or before January 1, 1955, at which time the new provisions of the vacation plan are scheduled to become effective.

Distribution of the revised HAPO Organization Directory was largely completed with offsite coverage, including other components of the Atomic Products Division and appropriate Services offices.

Letters were received from Salary Administration Services Department and Management Consulting Services Division recommending that HAPO be authorized to use the new Company salary plan. Letters from other Services divisions in regard to organization impose no important objections. We are planning now to submit our proposal to the Commission prior to December 1, asking for their approval to adopt the Company salary plan on January 1, 1955.

## UNION RELATIONS

In a consent election held on October 1, to determine if 16 Material Expeditors and Take-Off Men wished to be represented by the Hanford Atomic Metal Trades Council, 14 votes were cast with 11 for union representation and 3 against union representation.

An Agreement was signed with the Community Firemen on September 16 providing for a 10% reduction in the firemen's annual income and certain other modifications in the body of the Agreement.

The Guards have retained D. E. Williams as their attorney to force arbitration of a provision contained in a Patrol procedure memorandum.

## UNION RELATIONS (Continued)

The Millwrights continue to protest our assignment of Machinists to the temporary machining being performed in the 2101 Building but the protest has not reached serious proportions.

## EDUCATION AND TRAINING

There are 42 Technical Graduates on the Rotational Training Program as compared to 51 in August. A study made with the departments indicates that it will be necessary to hire 82 technical graduates to fill increased departmental needs and meet Selective Service losses during the next several months.

Registration for the Fall semester in the School of Nuclear Engineering amounted to 145 in the graduate-level courses and 162 in the college-level courses.

All of the training programs now being offered are being re-evaluated to determine their acceptance by departments, working time consumed, extent of participation, etc. A canvass of the departments is being conducted to determine the scope and direction of the present program.

## HEALTH AND SAFETY

Dr. Norwood addressed the First Northwest Industrial Health Conference at Portland, Oregon, and the Seventh Southwest Industrial Health Conference at Houston, Texas. Dr. Fuqua spoke at the annual meeting of the Washington State Medical Association in Spokane.

One major injury in Operations brought to an end the best safety record ever to be achieved by a General Electric plant. We operated 214 days without a major injury. This represents more than 9,400,000 man hours. No major injuries occurred in the Community. Minor injuries continued low.

## ORGANIZATION AND PERSONNEL

Total on roll September 1, 1954	895
Accessions	13
Separations	61
 Total on Roll September 30, 1954	 847

\* Totals include 42 Rotational Trainees.

Employee and Public Relations

PERSONNEL PRACTICES

Employment

	<u>August, 1954</u>	<u>September, 1954</u>
Applicants interviewed	2,051	1,788

461 of the applicants interviewed during September were individuals who applied for employment with the Company for the first time. In addition, 135 applications were received through the mail.

	<u>August, 1954</u>	<u>September, 1954</u>
Open Requisitions		
Exempt	1	--
Nonexempt	345	340

Of the 345 open, nonexempt, nontechnical requisitions at the beginning of the month, 214 were covered by interim commitments. Of the 340 open, nonexempt, nontechnical requisitions at month end, 246 were covered by interim commitments. During September, 89 new requisitions were received requesting the employment of 123 non-exempt, nontechnical employees.

	<u>August, 1954</u>	<u>September, 1954</u>
Employees added to the rolls	139	100
Employees removed from the rolls	<u>92</u>	<u>153</u>
NET GAIN OR LOSS	+47	-53

Separation Rate:

<u>Fiscal Month</u> <u>August, 1954</u>		<u>Fiscal Month</u> <u>September, 1954</u>	
<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
.57%	2.09%	1.16%	3.73%

Over-all Separation Rate:

<u>Fiscal Month</u> <u>August, 1954</u>	<u>Fiscal Month</u> <u>September, 1954</u>
.85%	1.63%

During September, 13 employees left voluntarily to accept other employment, 8 left to enter military service,

Employee and Public Relations

PERSONNEL PRACTICES

Transfer Data

Accumulative total of requests for transfer received since 1-1-54	493
Number of requests for transfer received during September	56
Number interviewed in September, including promotional transfers	59
Transfers effected in September, including promotional transfers	40
Transfers effected since 1-1-54 including promotional transfers	397
Transfers effected in September for employees being laid off	1
Number of stenographers transferred out of steno pool in September	7
Transfer requests active at month end	260

ADDITIONS TO THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
New Hires	7	65	1	73
Re-engaged	-	--	-	--
Reactivates	4	23	-	27
Transfers	-	--	-	--
<b>TOTAL ADDITIONS</b>	<b>11</b>	<b>88</b>	<b>1</b>	<b>100</b>

TERMINATIONS FROM THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
Actual Terminations	22	102	-	124
Removals from rolls (deactivates)	3	24	-	27
Transfers	<u>1</u>	<u>1</u>	-	<u>2</u>
<b>TOTAL TERMINATIONS</b>	<b>26</b>	<b>127</b>	<b>-</b>	<b>153</b>

GENERAL

	<u>8-1954</u>	<u>9-1954</u>
Photographs taken	208	177
Fingerprint impressions	225	156

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	<u>8-1954</u>	<u>9-1954</u>
General Electric cases	100	107
Facility cases	<u>30</u>	<u>27</u>
<b>Total</b>	<b>130</b>	<b>134</b>

Employee and Public Relations

PERSONNEL PRACTICES

During the month, direct recruiting was done at Milwaukee School of Engineering, Valparaiso Technical Institute and Dunwoody Industrial Institute. One hundred and thirty-five prospective Instrument Trainees were contacted, and 36 tentative offers made. Over 18 were conditional. Six have given us reporting dates of October 4.

Supervisory Selection Program - Thirty-nine candidates were administered the test batteries, the results interpreted and relayed to the section evaluators.

Clerical - Tests were used in 27 cases to aid in the selection of clerical employees.

Instrument Trainees- Two prospective instrument trainees were tested, both are being considered further.

Personnel Records and Investigation

<u>INVESTIGATION STATISTICS</u>	<u>8-1954</u>	<u>9-1954</u>
Cases received during the month	164	148
Cases closed	178	171
Cases found satisfactory for employment	127	116
Cases found unsatisfactory for employment	6	8
Special investigation conducted	17	7
Cases closed before investigation completed	38	25

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	4787
One-year awards made in September for those qualifying in August	37
Total two-year awards to date since January 1, 1950	2435
Two-year awards made in September for those qualifying in August	33
Total three-year awards to date	1177
Three-year awards made in September for those qualifying in August	29
Total four-year awards to date	380
Four-year awards made in September for those qualifying in August	35

SERVICE RECOGNITION

Total Service Recognition Pins presented to date	4283
Five-year Service Recognition Pins presented during September to exempt personnel	6
Five-year Service Recognition Pins presented during September to nonexempt personnel	26

During September, 17 people whose continuity of service was broken while in an inactive status were so informed by letter.

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	99
Salary checks delivered to employees at Kadlec Hospital	30
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:

	<u>August</u>	<u>September</u>
Pension Plan	97.8%	97.9%
Insurance Plan	99.2%	99.2%
Savings and Stock Bonus Plan	49.6%	50.3%

Sixteen letters were written concerning deceased employees and their families during September, regarding payment of monies from the Company and answering questions.

Two employees died during the month, namely:

Employee and Public Relations	9-23-54
Plant Auxiliary Operations	9-18-54

Since September 1, 1946, 154 life insurance claims have been paid totaling \$979,513.

Six employees retired during the month of September, namely:

George F. Wentworth	W-8028-627	Normal Retirement
Audress G. Harrel	W-4645-627	Normal Retirement
Grover C. Cranford	W-8131-636	Normal Retirement
Edward R. Barnett	W-6156-342	Normal Retirement
Charles E. Benton	W-6199-626	Optional Retirement
R. A. Carlson	W-4120-921	Optional Retirement

During September, 50 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date 314 employees have retired at Hanford, of which 160 are continuing their residence in this vicinity.

A total of 83 new employees attended Orientation Programs given by members of this group during the month of September. Of this number, 92.7% have signed to participate in the Pension Plan, 98.8% have signed up to participate in the Insurance Plan, and 89.1% have signed up to participate in the Good Neighbor Fund.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

The present percentage of participation in the Good Neighbor Fund is 67.3%.

During September all necessary work in connection with the Good Neighbor Fund's membership drive was completed and materials mailed to all non-participants and supervision.

In addition, all work necessary for conducting the election for new trustee members was completed during the month, even though the election is held during the month of October.

During the month a member of Employee Services discussed the various Employee Benefits during seven information type meetings held for the Maintenance Unit employees in 100-D and the employees of the Electrical Distribution Unit. There were approximately 190 employees in attendance at these meetings.

The necessary details in connection with the October 14 Fourth Annual Get-Together Dinner for retired employees are very nearly completed. Invitations were mailed out to 301 retired employees to the dinner, and at this date, 73 have indicated their intention of attending.

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		795
Number of reservists classified in Category A	117	
Number of reservists classified in Category B	81	
Number of reservists classified in Category C	60	
Number of reservists classified in Category D	537	
Number who returned to active duty to date		143
Number who returned to active duty in September		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

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Service

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered	823
Employees registered who are veterans	304
Employees registered who are non-veterans	519
Deferments requested to date (including renewals)	1362
Deferments granted	1091
Number of employees for which deferments have been requested	141
Number of employees classified in Category B	0
Number of employees classified in Category C	1
Number of employees classified in Category D	140
Deferments denied and appealed at state levels	17
Deferments denied and appealed at local levels	0
Deferments denied and held pending appeal at national level	5
Deferments denied by local board and not appealed	15
Deferments denied by state board and not appealed	47
Deferments denied at national level (by Gen. Hershey's office)	2
Deferments denied at national level (by President)	5
Deferments requested, employees later reclassified	1
Deferments requested, later withdrawn	1
Deferments pending	53

Military terminations since 8-1-1950 are as follows:

Reservists recalled	119
Selective Service	240
Women employees enlisted	<u>5</u>
	TOTAL 364

Employees returned from military service:

Reservists	62
Selective Service	<u>58</u>
	TOTAL 120

Known number not claiming reemployment rights	20
Number of employees still in military-leave status	224

PRIVACY ACT MATERIAL REMOVED

Workmen's Compensation, Liability Insurance, and Suggestion Plan

<u>Suggestion Plan</u>	<u>August</u>	<u>September</u>	<u>Total Since 7-15-47</u>
Suggestions Received	184	202	14660
Acknowledgements to Suggesters	160	212	
Suggestions Pending Acknowledgement	41	31	
Suggestions Referred to Depts. for Investigation	233	266	
Suggestions Pending Referral to Departments	41	43	
Investigations Completed and Suggestions Closed	152	204	
Suggestions Adopted - No Award	1	0	
Adopted Suggestions Approved by Committee for Award	84	52	
Total Net Cash Savings	\$ 12,994.33	\$ 6,349.32	
Total Cash Awards	\$ 2,045	\$ 890	
Total Suggestions Assigned to Field for Investigation	711	646	
Total Number Suggestions Outstanding to Departments	700	644	

The highest award of \$100 was paid to an employee in the Separations Section for his suggestion regarding a method of mass producing lantern slides. Savings in material and labor was realized through adoption of this suggestion.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 56 insurance companies and investigation agencies during the month of September, 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

Claims reported to Department of Labor and Industries	<u>August, 1954</u>	
	<u>Long Forms</u>	<u>Short Forms</u>
	47	429
	<u>September, 1954</u>	
	<u>Long Forms</u>	<u>Short Forms</u>
	45	374
Total Since Sept., 1946 - 22,394		
	<u>August, 1954</u>	
Claims reported to Travelers Insurance Co.	14	<u>September, 1954</u>
		*6
Total Since Sept., 1946 - 891		

\* Of the claims reported to Travelers Insurance Company during the month of September five were property damage claims and one was bodily injury.

Workmen's Compensation

-- Date of Injury: Approximately 9-22-53; Employer:  
; Nature of Injury: Back Injury.

The Department of Labor and Industries denied claim for an alleged back injury and he appealed. The Board, after hearing the evidence, ruled in favor of the and the Department. In his appeal had alleged that

1215389

Ga-7

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

he had sustained a ruptured intervertebral disc and that he was entirely unable to work. A conservative estimate of the savings as a result of the favorable decision would amount to approximately \$6,000 taking into consideration the fact that a laminectomy and fusion was performed resulting in a substantial permanent partial disability plus the necessary medical expenses as well as the resultant retention on full salary during the time off from work.

-- Date of Injury: 6-21-48; Employer:  
Construction Company; Nature of Injury: Tumor on Chest.

The \_\_\_\_\_ appealed from a decision of the Department of Labor and Industries to pay time loss as a result of unauthorized treatment. The claimant had submitted to treatment at a "quack" cancer sanatorium as a result of a small lump in his breast which was related to the industrial injury. The Board rendered a decision in favor of the \_\_\_\_\_ denying any further treatment or time loss to the claimant. \_\_\_\_\_ has since appealed the matter to the Superior Court for Benton County.

Hearing Loss Claims - Workmen's Compensation

Eight claims have been submitted to the Department of Labor and Industries by General Electric employees alleging hearing loss as a result of working in noisy power buildings in the 100 Areas. All eight claims have been rejected by the Department and three have been appealed by the claimants. It is expected that all eight will be appealed and in view of the far reaching effect of the resultant decision we have requested that the Chairman of the Board of Industrial Insurance Appeals act as the hearing officer. He has stated that he is also very much interested in following the claims and plans to hear the appeals personally. Preliminary plans have been established between G. C. Butler, Dr. P. A. Fuqua and the Suggestions and Insurance Unit for handling the defense of these appeals.

Liability Insurance

-- We have been advised by Travelers that Dr. Stevenson's examination revealed that \_\_\_\_\_ surgery did not correct his condition and further surgery is likely. In addition, Dr. Stevenson felt that there were certain neurotic tendencies which overlay the physical condition and that unless these conditions are improved or corrected there is a good possibility that \_\_\_\_\_ will not return to work even though he would be considered physically able to perform his job.

-- This appeal on behalf of \_\_\_\_\_ was argued before the Federal Circuit Court of Appeals on September 1, 1954 in Seattle. We are now awaiting the decision of that court.

-- These suits allege negligence on the part of \_\_\_\_\_ to properly interpret X-rays taken at annual physical examinations and further communicating to the plaintiffs that there were no abnormal findings. A Demurrer was filed on behalf of the \_\_\_\_\_ and on September 21, 1954 argument was heard in Franklin County

1215390

Ga-8

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

Superior Court on the Demurrer. Superior Court Judge, B. B. Horrigan, advised that he would take the Demurrers under advisement and rule at a later date. Also on September 21, a deposition was taken by Travelers' attorney, John Gavin, of

- An oral deposition or interrogatory of \_\_\_\_\_ was taken by Travelers' attorney, John Gavin, on September 21, 1954. Following the deposition Mr. Gavin advised the attorney for \_\_\_\_\_ that he was interested in proceeding further with settlement negotiations. It was our understanding that \_\_\_\_\_ made an offer to settle for \$12,500. This is subject to a counter offer and negotiations will continue toward settlement if possible.

- Both \_\_\_\_\_ and \_\_\_\_\_ approved Travelers' recommendation to appeal the case to the State Supreme Court. The Notice of Appeal has been served as well as the Statement of Facts on the matter. On September 20, 1954 the plaintiffs' attorney was served with the Appellant's Opening Brief. A copy of the brief was also sent to the Clerk of the Supreme Court of the State of Washington the same day.

General

Chapter 233 of the Laws of 1947 provided that pensioners on the rolls of the Department of Labor and Industries should receive an additional \$25 per month to be paid from the General Fund of the State of Washington. The increased payments to both \_\_\_\_\_ and \_\_\_\_\_ pensioners were paid from the General Fund until 1951, at which time the Department advised us that by virtue of our contract we were liable for the increases from 1947 until 1951 and thereafter. The decision was contested and the determination as to liability was the subject of considerable correspondence and negotiations. It has since been determined that the only charge for increased pension awards against \_\_\_\_\_ should be for pensions awarded to the employees of \_\_\_\_\_ and its subcontractors from September 1946 to 1947 when the law became effective. The net result of this agreement is that \_\_\_\_\_ is to receive a refund from the Department because of \_\_\_\_\_ funds paid to \_\_\_\_\_ pensioners which have since been determined to have been paid in error.

Employee and Public Relations  
PERSONNEL PRACTICES SECTION

Technical Recruitment

During the month, this unit has assumed the handling of all technical recruitment activities with the exception of a very few transfer cases. All office facilities were moved from Dorm W-10 to new quarters in the 705 Building, where space for three staff members and three secretaries has been assigned.

Two invitations to visit were extended during the month, and two acceptances received. Four candidates visited, and there are four candidates presently scheduled to visit. Four offers were extended, two offers were rejected, and none were accepted during the month. There are five offers outstanding as of September 30. Two candidates with PhD training were signed on the roll during the month, one a new graduate and the other an experienced man. Dates have been established for PhD interviewing at 22 colleges and universities. Hanford will participate in all but four of those, and recruiters have been selected. Hanford will also participate in PhD recruiting at nine additional schools and the recruiters have been selected, but dates not yet scheduled for those.

To date, 34 acceptances have been received as a result of campus recruiting of new technical graduates, an increase of two during September--neither of whom has yet reported for work. All of the business graduates recruited in the spring are now on the roll.

Twelve direct placement offers to experienced BS or MS candidates have been extended, and of these 7 have accepted our proposals, with 2 already on the rolls. Five offers are still open. The physics outlook is improving, with the acceptances during the month of 2 BS/MS graduates with a slight amount of experience. We have several other offers to such people pending.

Of a total of 43 technical employees who left employment at HAP0, 13 terminated to return to school, 17 terminated for other reasons, 2 transferred to other locations, and 11 were college juniors who had been hired only for summer employment and who left to resume their college work. These figures include terminations through September 23, 1954.

Employee and Public Relations

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During the month of September, the News Bureau issued 43 releases. The break-down by category, distribution, and content was as follows:

<u>Subject</u>		<u>Distribution</u>	
Pay and Benefits	3	Local	31
Employment Services	13	Daily	4
Good Will	8	Columbia Basin NEWS	2
Technology and Research	4	Tri-City HERALD	1
Utilities and Public Works	2	Special	4
Safety, Fire	2	Weekly	1
Security	1		
Real Estate	2	<u>Content</u>	
Richland-Hanford protection	1	Information	4
Health and Medicine	2	Pictures	2
Plant Services	1	Short releases	31
Organization Changes	1	Long releases	5
Police and Fire	1	Feature	1
Total	43		

Of the thirty-one local releases, one was also sent to the Daily "A" list and two were sent to the business list. The four daily releases also were sent to the local list and one was sent to the Science-Engineering list.

In addition to the forty-three releases released, four feature stories and a packet of thirteen pictures were furnished to the TRI-CITY HERALD for use in the edition they published when President Eisenhower dedicated McNary Dam.

The Tenth Anniversary of the start-up of the first pile was given extensive publicity during the month. Two stories were distributed nationally through the six GE publicity outlets throughout the country, and to news media throughout the Northwest.

News stories and pictures announcing the visit of the G-E vice-presidents to Hanford and the purpose of their visit were released to Pacific Northwest dailies, wire services, and GE Public Relations representatives. A round-up story on their visit was sent to the MONOGRAM and the Public Relations Services Division in New York. An interview also was arranged for the local Tri-City HERALD reporter with Mr. Belanger and Mr. McCune.

A story concerning a talk Dr. Norwood gave at the Industrial Health Conference in Houston, Texas, received wide distribution. Advance copies were sent, with pictures, to the six GE publicity outlets throughout the country, and both our news story and Dr. Norwood's speech manuscript were sent to the AP, UP, and INS News Bureau Chiefs in Houston for their special attention. This amounted to considerably more publicity effort than is usually given to speeches delivered by Hanford people.

## Employee and Public Relations

A news story about the production of radioisotopes at Hanford was sent to the Coordinating Organization Director for transmittal to Oak Ridge for declassification. We have been assured by a representative of the Public Relations Services Division that, if this story is declassified, it will result in considerable national publicity for the Hanford operation.

A comprehensive description of the Radiological Sciences Department and its activities at Hanford was sent to the GE public relations representative at San Francisco at his request. Activities of the department were described and a simplified organization chart was sent, along with seven photographs and ten news stories that described activities of the department.

William A. Benjamin, West Coast representative for McGraw Hill, visited Hanford on September 16 and 17. The main purpose of his visit was to meet and talk with engineers, secure their ideas about the needs and requirements for new text and reference books, and to poll their interest in preparing manuscripts in all areas of nuclear science and engineering.

Two signed articles were submitted for publication this month: "Operation Burial," by R. N. Donelson, sent to the Schenectady News Bureau for simultaneous release to BUSINESS WEEK and FACTORY MANAGEMENT AND MAINTENANCE; and "Sampling for Inline Instrumentation: A Degasser for Obtaining Air-Free Samples," by U. L. Upton, submitted to CHEMICAL PROCESSING.

Articles approved for publication during the month were: "Radiation Units and Radiation Instruments," by H. M. Parker, for publication in RADIOLOGY; and "Gastro-Intestinal Absorption of Plutonium II. Effect of Plutonium Concentration in Solution Fed," by R. C. Thompson, for publication in RADIATION RESEARCH.

A request from FACTORY MANAGEMENT AND MAINTENANCE was received this month for an article on the work of our Operations Analysis group. The article is being prepared.

As a result of the visit of the Associate Editor of INDUSTRIAL AND ENGINEERING CHEMISTRY to Hanford in June, that publication is considering publishing a staff-industry collaborative report on chemical processing at Hanford.

Hanford's contribution for the January issue of the GE REVIEW, which reviews last year's technical accomplishments within the Company, was completed and sent to the REVIEW. The article consisted of nine double spaced pages and seven illustrations.

The following papers were approved this month:

<u>Presentation or Submission Date</u>	<u>Subject and Organization or Publication</u>	<u>Author</u>
9/21	"How Industrial Health Fits into the Community," Northwest Industrial Medical Conference, Portland	W. D. Norwood
10/14-16	Photographs, Twelfth Annual Electron Microscope	T. K. Bierlein

1215394

Employee and Public Relations

11/5-12	Society of America Meeting and ASM Metallographic Exhibit	R. Borasky
11/18-19	"Statistical Control of Chemical Processes," Ninth Midwest Quality Control Conference, Dallas	C. A. Bennett
4/1955	"The Possible Role of Atomic Energy in Cali- fornia Water Utilization," Nuclear Engr. Conf. UCLA	C. W. Botsford J. E. Robb
4/1955	Abstract, "Modifying Reactor Control System Requirements During Reactivity Transients," Nuclear Engr. Conf. UCLA	R. D. Schilling
Cleared in Sept. '54	"Age Diffusion Theory for Beta Ray Problems," Unclassified Hanford Works Formal Report	W. C. Roesch

The following speeches were arranged during the month:

9/15	"Human Relations," Lewis and Clark Faculty	V. J. Byron
9/22	"Geology of Southeastern Washington," Rich- land Kiwanis--Hugh Warren previously scheduled	R. L. Brown
10/7	Informal talk on Hanford reactors, Chehalis Kiwanis	J. H. Warren
10/15-16	"What Industry Expects of College Students and How Colleges Can Better Equip Students to Work in Industry," Junior College Workshop, Yakima	D. W. McLenegan
10/15-16	"How Can Industry, Commerce and the Junior Colleges Help Each Other," Junior College Workshop, Yakima	G. D. Barr

The Community Newsletter was written and distributed to community leaders in Pasco, Kennewick and Richland.

A complete description, with photographs, of seven locally-produced displays which GE has provided for public exhibit was sent to the AEC's Public Information office at their request. It was stated that the displays are available for exhibit in the future and that several of them could be combined into a single, larger exhibit.

Subjects emphasized in GE NEWS lead and feature stories during September included: Nucleonics Employees Good Neighbor Fund; commemoration of the 10th Anniversary of the start of the first Hanford reactor; GE School of Nuclear Engineering; General Manager's Safety Award; candidates for office in the Genfrics; new bus routes and schedules of the Richland-Area bus system; Safety Stampede, and the final three full-page messages on "Your Company," out of a series of 6 such messages developed by this section were published in separate GE NEWS issues.

## Employee and Public Relations

The Operation 4S "Methods Improvement--Cost Reduction" program was launched during the month. Four Hanford-produced posters were placed throughout the plant. Four booklets, containing basic principles of methods improvement techniques, were distributed to all nonexempt employees, advance copies to management. The initial booklet was distributed to nonexempt employees' homes accompanied by a letter from the General Manager. The program was backed up by extensive GE NEWS publicity and notices in the Management NEWS Bulletin. Through the program, non-exempt employees are urged to seek out and submit as suggestions through the Suggestion Plan all cost reduction ideas they develop.

Information program for promoting the Nucleonics Employees Good Neighbor Fund Drive was developed and placed in effect. The program included extensive GE NEWS publicity, and distribution of a new G.N.F. sticker--along with Community Chest material to present members.

The problem of undesirable trees in Richland was discussed with members of the Community Section and a representative of the Community Council. Assistance in developing an information program will be provided.

The September Safety topic, "The Case of the Unavoidable Injuries," was developed and distributed, and the October topic was produced. The September health bulletin, "It's Your Skin," was developed and distributed to all employees.

The September 7 meeting of the Program activities of the Central Safety Council was attended by a member of this section in the capacity of Secretary.

Four Management NEWS Bulletins were developed and distributed to all exempt employees.

Completed copies of the revised GE-HAMTC and the GE-Hanford Guards Agreement booklets, produced through this section, were received during the month by the customer, Union Relations.

Community Operations annual report was placed in the hands of the successful bidder, Columbia Basin NEWS commercial printing plant, for production.

During the month of September a total of 58 movies were shown to approximately 1150 employees.

Commercial art work included rough and final layouts for the following: double-page photo layout showing Hanford 10 years ago, full-page Good Neighbor Fund photo montage, Good Neighbor Fund Drive poster, double-page photo layout for Community Chest feature, three Operation 4S editorial cartoons, double page Operation 4S photo layout, and two single 4S Operation layouts, and a 4S paste up publicity photo, GE NEWS messages on "Your Company," and September and October safety topics.

Miscellaneous art work completed during the month included: illustration for

## Employee and Public Relations

fire prevention scrap book cover, a "17 for One" Community Chest design, layout for Stores Unit badge, revision of the EC and PR visualizer and a proposed layout for a PR billboard.

The complete motion picture story of the arrival of the huge chemical concentrators for installation in the Purex building was filmed this month. The story included the arrival of the concentrators at Portland, Oregon, the unloading from sea-going vessel to river barges, the passage of the barges through the locks at McNary Dam and final unloading in Richland and transfer to trucks which took them to their destination in the 200-E Area. The film footage will be included in the Construction Progress Motion picture.

The HAPO produced motion picture, "Here's Hanford," was shown to the wives of the visiting Justices of the Peace and the Jay-cee-ettes this month. Following this showing the film was shipped to John Bryan of Audio-Visual Services in Schenectady at his request.

Arrangements were made for holding a special preview of G-E's latest films, "The Atom Goes to Sea" and "The Story of Light". The showings will be held for HAPO and AEC Management along with press representatives on October 7 at the Public Library.

"Inside Hanford," a weekly radio program produced by this Section has been scheduled for broadcast. The first program will be heard on station KWIE at 6 p.m. on Thursday, October 14 and every week thereafter. Science Forum has been given 7:30 to 8:00 p.m. time on Monday, October 11, and every Monday thereafter. Both broadcast times are considered by the station to be preferred listening times.

"Hanford Vignettes," a fifteen-minute radio program depicting the old days at the start-up of the first reactor, was produced by this Section. Six copies of the show tape recording were sent to radio stations throughout Central Washington for broadcast to commemorate 10 successful years of reactor operation at Hanford. Management of Radio Station KWIE in Kennewick made arrangements with Columbia Broadcasting System to broadcast the complete "Hanford Vignettes" radio program on the network show, "Sunday Desk." The program was heard at 5:30 p.m. on Sunday, October 3.

A special recording session was conducted between a member of this section and Louis Newman, Manager, Safety and Health Department of New York City. Copies of the interview were made and distributed to all three local radio stations for broadcast to publicize winning of the General Manager's Safety Award by HAPO personnel.

"An Atomic Style Show," a HAPO-produced pilot Television featurette, was reviewed in Schenectady by the Company's Audio-Visual Services section and members of the GE News Bureau. On their recommendation, the featurette will be reviewed by NBC and CBS TV officials for possible release on the Dave Garroway and John Cameron Swazy network shows.

## Employee and Public Relations

At the request of John Bryan of Audio-Visual Services, Schenectady, scripts and shooting sequences are being developed on two television featurettes. The program, on remote handling devices and remote viewing devices, are being produced for possible inclusion in a live TV show originating in Los Angeles on November 28. The subject of the TV show will be "Materials Handling Equipment in the Atomic Energy Industry."

Extensive tape recording production was undertaken this week of General Electric vice presidents and other visiting officials for use on current radio programs being prepared by this section for broadcast by regional stations. Material now is available from talks given by Messrs. McCune, Lockton, and Linder.

A total of 319 photographic assignments were completed this month, and 10,579 prints were produced, of which 3,775 were "A" and "B" employee identification badge photographs. A total of 6,804 prints were area and news work. The increase in assignments over last month was due to the Fire Prevention Week observance, additional pages for the GE NEWS, and photography of visitors to EAPO.

Three thousand three hundred feet of 16mm motion picture film was exposed on Purex Construction for the AEC's Construction Progress Motion picture. Three thousand three hundred feet of 16mm motion picture film was exposed on 100-K Construction Project for the AEC.

See attached Statistical Report for Photography Unit.

PHOTOGRAPHY UNIT  
 MONTHLY REPORT  
 SEPTEMBER, 1954

EMPLOYEE & PUBLIC RELATIONS DEPT.

COMMUNITY OPERATIONS

Library	61	30	13	46	35mm	3 1/4" X 4"	3 1/4" X 4"	16mm
Recreation		85		24	Color	(B&W) Slides	Color Slides	M. P.
Engineering		18		9				
Police	275	14		101				
Fire	45	2		41				Film

EMPLOYEE COMMUNICATIONS & PUBLIC RELATIONS

Public Communications		31		49			14	
News Bureau	158	20		407				
G. E. News	344	19	5	47				
Audio Visual Communications		96		33				
Special Programs	36	120	22					

HEALTH & SAFETY

Hospital Administration		2		2				
Public Health	8	8	16	9				2

PERSONNEL PRACTICES

Employment	680			136				
------------	-----	--	--	-----	--	--	--	--

ENGINEERING DEPT.

DESIGN		126	457	177	28			
Drafting			1	1				
Processing			11					

ENGINEERING ADMINISTRATION

Technical Information		1						
-----------------------	--	---	--	--	--	--	--	--

PROJECT ENGINEERING

Minor Project		12	103	26				
			35	25				

TECHNICAL

Applied Research	87	718	935	222			44	
Fuel Technology	30	72	553	49				7
Pile Technology			976	56				
Separations Technology		23	133	62				

215399

(Continued)

PHOTOGRAPHY UNIT MONTHLY REPORT SEPTEMBER, 1954	2"		4"		5"		8"		11"		16"		3 1/4" X 4"		3 1/4" X 4"		16mm			
	X	X	X	X	X	X	X	X	X	X	X	X	X	(B&W) Slides	Color Slides	M. P. Film	N	E	G.	
MANUFACTURING DEPT. MANUFACTURING ADMINISTRATION																				
PLANT ENGINEERING																	7			
SEPARATIONS									7											
METAL PREPARATIONS								50									16			
PLANT AUXILIARY OPERATIONS DEPT. SECURITY & PATROL																				27
PURCHASING																				
RADIOLOGICAL SCIENCES DEPT. BIOLOGY																				14
BIOPHYSICS																				9
A.E.C. OPERATIONS																				
A.E.C. SAFETY																				20
A.E.C. SECURITY																				22
TOTALS																				1,646
																				56
																				116

	JULY	AUGUST	SEPTEMBER
TOTAL ASSIGNMENTS	289	257	319
TOTAL NEGATIVES	1,362	1,498	1,646
TOTAL PRINTS	10,174	11,980	10,576

1215400

Gb-8

## Employee and Public Relations

### UNION RELATIONS

#### Union Relations - Operations Personnel

A consent election involving 16 Material Expeditors and Take-Off Men employed in the Manufacturing Department was held by the National Labor Relations Board on Friday, October 1. The petition submitted to the Board by the Hanford Atomic Metal Trades Council was supported by 11 signatures.

The results of the election were as follows:

Eligible to vote	16
Voted	14
Union	11
No Union	3

An Agreement was signed with the Community Firemen on September 16 providing for new base salaries and progression schedules which accomplish a 10% reduction in firemen's annual income. Modifications in the body of the Agreement were accepted as proposed by the Company. These modifications have little monetary significance and were considered desirable only to bring the Agreement in line with existing practices. The Agreement has a terminal date of September 30, 1955, consistent with the other three HAPO bargaining units.

The Guards have turned their demand for arbitration over to D. E. Williams as an attorney to force us to arbitrate a provision of a Patrol procedure memorandum that unfortunately was given official status in the eyes of the Union because it was signed by Patrol supervision and the Union business representative.

Williams has expressed a reluctance to accept the case if it means going to court over the issue. I am confident that the matter can be resolved short of court action if Williams will use his influence to effect a settlement and have so advised him.

The Hanford Guards Union and the Hanford Atomic Metal Trades Council Agreement booklets were received from the printer during the month and distribution made to the field.

Visitors from Westinghouse (Arco) and Dow (Rocky Flats) were received during the month. Both of these contractors are operating under AFL-Council type of agreements and were interested in an exchange of information and discussions of mutual problems. It was interesting to note that Westinghouse at Arco is paying rates (weekly salaries) that are quite comparable to our rates at HAPO.

On September 15 and 16, Dow representatives from Rocky Flats met with Atomic Energy Commission and General Electric representatives to discuss our Davis-Bacon procedures with a view toward adopting the appropriate ones at their site. The meeting was well attended and was mutually satisfactory both as an information meeting and as a complete review of our HAPO practices.

Employee and Public Relations

UNION RELATIONS

Grievance Statistics:

A total of thirty-four (34) grievances were received and four (4) Step II grievance meetings were held during the month. A breakdown of the grievances received and processed follows:

	<u>ALL DEPARTMENTS</u>			<u>Total Unit</u>	<u>Total Nonunit</u>
	<u>HAMFC</u>	<u>HGU</u>	<u>BSKIU</u>		
Received this month	33	1	0	34	0
Received this year	235	43	1	279	25
Step I					
Pending August 31	1	0	0	1	1
Settled this month*	15	1	0	16	0
Settled this year	147	14	1	162	22
Pending September 30	7	0	0	7	0
Step II					
Pending August 31	23	0	0	23	0
Settled this month**	12	2	0	14	2
Settled this year	72	30	0	102	5
Pending September 30	17	0	0	17	0
Arbitration					
Pending August 31	3	1	0	4	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending September 30	4	1	0	5	

BY DEPARTMENTS

	<u>Received</u>		<u>Settled Step I*</u>		<u>Settled Step II**</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Manufacturing						
Reactor - Unit	14	104	4	61	6	32
Nonunit	0	5	0	4	0	0
Separations - Unit	14	54	8	37	2	14
Nonunit	0	4	0	2	0	1
Metal Preparation - Unit	1	24	0	17	0	5

\*Grievances brought to Step II prior to July 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 July 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

BY DEPARTMENTS (Cont'd.)

	<u>Received</u>		<u>Settled Step I*</u>		<u>Settled Step II**</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Plant Auxiliary Operations						
Transportation - Unit	2	17	1	9	1	8
Plant Protection - Unit	1	54	1	22	2	32
Nonunit	0	1	0	1	0	0
Stores - Unit	0	2	0	2	0	2
Electrical Distribution- Unit	0	1	0	0	0	1
Telephone - Unit	1	3	1	2	0	1
Nonunit	0	1	0	0	0	1
Employee and Public Relations						
Community - Unit	0	11	0	6	0	2
Hospital - Unit	0	1	0	1	0	0
Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	1	8	1	7	0	1
Nonunit	0	4	0	3	0	0
Engineering - Nonunit	0	5	0	7	2	2
Financial - Nonunit	0	3	0	2	0	1

\*Grievances brought to Step II prior to July 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 July 1, 1954, are, for the purpose of this report, considered settled at Step II.

BY SUBJECTS

<u>Unit</u>	<u>Manufacturing</u>		<u>Plant Aux. Operations</u>		<u>Emp. &amp; Pub. Relations</u>		<u>Radiological Sciences</u>		<u>Engineering</u>		<u>Financial</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Discrimination	0	0	0	1	0	1	0	0				
Jurisdiction	18	78	0	20	0	5	1	4				
Health-Safety-San.	3	10	1	3	0	2	0	0				
Hours of Work	1	7	1	29	0	0	0	0				
Overtime Rates	1	18	0	4	0	0	0	0				
Holidays	1	3	2	2	0	0	0	0				
Sick Leave	0	6	0	0	0	1	0	0				
Seniority	3	16	0	5	0	0	0	1				
Grievance Procedure	0	3	0	0	0	0	0	0				
Wage Rates	1	21	0	6	0	2	0	1				
Miscellaneous	1	21	0	6	0	1	0	1				

Employee and Public Relations

UNION RELATIONS

BY SUBJECTS (Cont'd.)

	<u>Manufacturing</u>		<u>Plant Aux. Operations</u>		<u>Emp. &amp; Pub. Relations</u>		<u>Radiological Sciences</u>		<u>Engineering</u>		<u>Financial</u>	
	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>
	<u>No.</u>	<u>Year</u>	<u>No.</u>	<u>Year</u>	<u>No.</u>	<u>Year</u>	<u>No.</u>	<u>Year</u>	<u>No.</u>	<u>Year</u>	<u>No.</u>	<u>Year</u>
<u>Nonunit</u>												
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	0	0	0	0	0	0	0	1	0	0

Construction Liaison

Millwrights continue to protest our assignment of Machinists to the temporary machining being performed in the 2101 Building. The protest has not reached serious proportions but is a persistent one in view of the importance attached to the claims for jurisdiction over this work by both the Millwrights and the Machinists.

## Employee & Public Relations

### SALARY ADMINISTRATION

1. Preparations have been completed prior to conducting a selective salary survey with several companies in San Francisco and Los Angeles early in October. Work continues on the selection of suitable positions for survey in the Northwest, and about twenty condensed position descriptions have been prepared to date.
2. ANP requested assistance in the establishment of salary levels for eight positions at the Idaho Falls Plant. While salary levels were recommended, it was emphasized that they should be accepted on a tentative basis since the position descriptions contained rather limited information.
3. Considerable progress is being made toward setting up titles involved in the new salary plan. Revised suffix (organization) codes have been set up and distributed to the Department Managers with a request to prepare and submit lists of employees, both exempt and non-exempt, to this Section by September 30. These lists are to indicate old and new suffix.
4. Reimbursement Authorization No. 231 was received from the AEC covering revisions resulting from the GE-Union agreements of June 10, 1954. Reimbursement for the revised vacation plan was withheld at this time by the AEC, but we are assured approval will be forthcoming on or before January 1, 1955, at which time the new provisions of the vacation plan are scheduled to become effective.
5. A reimbursement authorization request covering revisions and additions made necessary as the result of the new agreement with the Community Firemen, effective September 13, 1954, has been circulated among GE management for review.
6. Studies largely in conjunction with the Manager of PAO, and conferences with the General Manager and with Managers of E&FR, Manufacturing, and Financial Departments led to drafting a plan for dissolution of PAO. During the month the plan was discussed in New York by the General Manager and is to be implemented without appreciable change. A study made in June for the General Manager proposed changes in the Engineering Department. During the month the plan was further developed, incorporating a number of alternate details proposed by the Manager of the Engineering Department.  
  
Assistance is being given the Financial Department in connection with general organization adjustments. Specific action was crystallized during the month affecting changes within the Plant Accounting Unit. Studies are nearing completion in connection with functional realignments in the SF Accountability Section.
7. Distribution of the revised HAPO Organization Directory was largely completed with offsite coverage, including other components of the Atomic Products Division and appropriate Services offices.
8. Letters were received from Salary Administration Services Department and Management Consulting Services Division recommending that HAPO be authorized to use the new Company salary plan. Letters from other Services divisions in regard to organization impose no important objections. We are planning now to submit our proposal to the Commission prior to December 1, asking for their approval to adopt the Company salary plan on January 1, 1955.

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

<u>Department</u>	<u>Last Month</u>	<u>This Month</u>
Engineering		
Technical	16	18
Design	10	7
Project	7	5
Manufacturing		
Metal Preparation	0	0
Separations	0	2
Reactor	10	6
Radiological Sciences		
Biology	2	1
Records & Standards	2	1
Bio-Physics	3	1
Plant Auxiliary Operations		
Operations Research	1	1
TOTAL	<u>51</u>	<u>42</u>

Permanent Placements

There were five placements off the Program during the month as follows:

Technical	2
Design	1
Bio-Physics	1
Records & Standards	1
TOTAL	<u>5</u>

A survey to determine the number of placements from the Program anticipated by the various Sections to June, 1955 was completed during the month. With only 42 graduates now on the Program, additions will be needed to meet the requirements of the Departments. A requisition is being prepared.

Employee and Public Relations  
EDUCATION AND TRAINING SECTION

ROTATIONAL TRAINING PROGRAM (Continued)

Selective Service

Seven technically trained men were lost to Selective Service during the month making a total of thirty-three lost to this cause to date. Losses by months are as follows:

September 1953	1
November 1953	1
December 1953	1
January 1954	1
March 1954	2
April 1954	5
May 1954	4
June 1954	1
July 1954	7
August 1954	3
September 1954	7
TOTAL	<u>33</u>

Anticipated losses during the remainder of the year total nine even though the trend is up for the past few months. Only five of the thirty-three lost to date have enlisted and contacts with some of the men vulnerable to Selective Service indicate the bulk will prefer to be drafted.

Each of the men leaving for service is being interviewed by this office to impress upon him our continued interest, and correspondence with a considerable number is being maintained during the period of service.

Arrangements were made to have the "G.E. Review" sent to all of these men while they are in service to assist in not only maintaining their interest in the Company, but perhaps also to stimulate interest in others with whom these men have contact.

Summer Program

All of the juniors on the Summer Program have returned to their respective colleges. Letters are being written to each school expressing appreciation of the quality of the students made available to us. Two of the ten juniors employed during the summer submitted well prepared reports which have been well received by the sections involved; namely "Investigation of Surface Resistance Meter" by Harry Glaze of Stanford and "Report on Tests of Wetting Properties of Caps Cleaned by Machining" by Harley Stewart of the University of Washington. Both men were assigned to Metal Preparation Section.

Employee and Public Relations  
EDUCATION AND TRAINING SECTION

ROTATIONAL TRAINING PROGRAM (Continued)

Report of Personnel Activities 1950-1954

Considerable time was given to concise presentation of data covering activities of this office for the period 1950-1954 for presentation to officials of the Company visiting HAPO.

SCHOOL OF NUCLEAR ENGINEERING

Graduate catalogs were sent out to all new technical college graduates who have come to the plant during the past five years, and former students, which totaled nearly 1100. In addition, a separate college-level announcement was sent to over 1000 laboratory assistants, engineering assistants, radiation monitors, utility operators, cost clerks, technicians and others without any college background. Announcements were also sent to selected supervisors for their endorsement through staff meetings to the supervisors who are in daily contact with the regular employees, whether they are college or non-college men.

The School of Nuclear Engineering is conducting the following 22 courses, 14 graduate and 8 college level courses, in the fall term.

GRADUATE

Differential Equations	25
Advanced Calculus	11
Math Statistics I	11
Modern Physics I	18
Nuclear Physics I	7
Theoretical Physics I	6
Physical Chemistry I	9
Radiochemistry	13
Fluid Mechanics	9
Diffusional Processes I	9
Elec. Transmission Problems	8
Mechanical Vibrations	5
Engineering Metallurgy I	9
Adv. Physical Metallurgy	5
SUB-TOTAL	<u>145</u>

Employee and Public Relations  
 EDUCATION AND TRAINING SECTION

SCHOOL OF NUCLEAR ENGINEERING (Continued)

COLLEGE-LEVEL

Intermediate Algebra	21
College Algebra	17
Differential Calculus	24
Automatic Control	17
Instrument Electronics	23
Business Law I	18
Cost Accounting	10
El. Accounting I	<u>32</u>
SUB-TOTAL	162

TOTAL

307

The following eleven courses were cancelled due to insufficient registration.

Inorganic Chemistry  
 Adv. Quantitative Analysis  
 Ch. Eng. Thermodynamics  
 Heat-Power Cycles  
 Plane Trigonometry  
 College Physics  
 College Chemistry  
 Temperature Measurement  
 Materials and Processes  
 Mechanics - Statics  
 Modern Economics

At the same time last fall our registration stood as indicated below:

<u>Registration</u>	<u>Fall 1953</u>	<u>Fall 1954</u>
Graduate	165	145
College-level	<u>123</u>	<u>162</u>
TOTAL	288	307

These figures show that our graduate registration is down 12 % from last year while the registration in college-level courses has significantly increased 32%. Total registration is up about 6 %.

Last year the school expanded its offerings in college-level studies and had a good response from project employees. I feel the increased interest in college-level courses is due to the interest of many supervisors who call these courses to the attention of their employees and to the fact that once started the employees expect the school to continue offering undergraduate subjects.

Employee and Public Relations  
EDUCATION AND TRAINING SECTION

SCHOOL OF NUCLEAR ENGINEERING (Continued)

Now that classes have stabilized, efforts will be concentrated on 1) collection of the remaining tuition (75 paid in full now) and 2) obtaining full registrations with the four affiliated colleges and universities at both graduate and college level. In the graduate courses 58 students are continuing their university affiliations, and 43 others intend to register with one of the affiliated Schools.

Approximately ten men are working on a thesis this term. Also according to the registration cards, 22 are undecided about their affiliation and 15 want no graduate credit.

Of the 103 students who have each completed 4 or more semesters of study in our School of Nuclear Engineering, 10 are currently working on theses toward the MS degree (this supplements the 15 who have received the MS degree earlier).

Approvals

The University of Washington Board of Regents has approved Gerald B. Barton, Marshall W. Cook and John W. Riches as lecturers in the Richland program. Departmental approvals have been made for the following instructors to teach specific courses:

A. S. Wilson	Adv. Inorganic Chemistry
G. B. Barton	Radiochemistry
M. W. Cook	Diffusional Processes I
J. W. Riches	Adv. Physical Metallurgy

Additional approvals are pending.

Visits

Glenn Jones of the State College of Washington Extension Service expects to visit Richland on September 28 and again on October 4 and 5 to register students for the three courses that Washington State College has planned for the Richland area: English Composition, American Government and Intermediate Algebra. On October 5 Mr. Jones will talk over the local situation for college-level courses to be offered in the Spring term.

Dean L. C. Cady of the University of Idaho has indicated that they plan to visit Richland around October 26 and 27.

Dean H. P. Hansen indicates that the Oregon State College visit may be the second week of November or early December.

Employee and Public Relations  
EDUCATION AND TRAINING

TRAINING

Non-Exempt Rating program was held September 7, 8, 10, September 13-17, and September 20, 21, 22, 24, with attendance of 185 supervisors of the Manufacturing Department. The rating procedure is explained through the use of visual aids, and general discussions are held on any rating problems brought up by the group.

Supervisor's Accident Prevention program was held Wednesday, September 8 and Thursday, September 16 at 200-W and 300 Areas with an attendance of 28 supervisors. These four-hour meetings give supervisors an opportunity to discuss the problems of accident prevention and how they, as supervisors, can develop their employee's awareness of the desirability of performing their jobs safely. The Manager of General Electric Health and Safety Section, New York office, was guest speaker in the September 16 meeting.

Principles and Methods of Supervision was presented to Group #74 during the two weeks of September 13-24, with 12 supervisors completing the course. PMS dinner-meeting was held Wednesday evening, September 1 at the Desert Inn for Groups #71, 72, and 73. There were 48 members and guests present. The General Manager was the principal speaker.

PMS Refresher was held Wednesday, September 1 at the request of 3 supervisors who attended this meeting. All exempt employees who have completed PMS may enroll in a refresher session for a review of the factors in the art of persuasion.

Effective Human Relations Group #17 and 19 met for the third conference Wednesday 15 and 22, with 15 supervisors in attendance. This 12-hour program of three meetings deals primarily with actual human relations case studies. These cases are presented through various films, records, and written background, allowing group discussion of these and on-the-job cases of the supervisors attending.

Basic Economics was presented Thursday, September 9 with an attendance of 7 exempt personnel. This participation-type meeting emphasizes the basic principles of our economic system and the social, community, business, and governmental aspects of our economy.

New Supervisors 40-Hour program was held during the week of September 27-October 1, with an attendance of 13 new supervisors. This 40-hour schedule covers Company organization, effective management, the new employee, wage rates, labor relations, Company policies and procedures, and various personal considerations. The importance of understanding people is stressed throughout the program by discussions of case studies of the day-to-day problems of supervisory-management. There are eight films shown in this program.

Employee and Public Relations  
EDUCATION AND TRAINING

TRAINING (continued)

Conference Leading was conducted Tuesday, September 28, with a participation of 13 exempt personnel. These meetings permit actual practice in leading group discussions.

Supervisor's Handbook Records:

Number issued during September	1
Number returned during September	6
Number on Hand	193

Other Training Activities

A member of Training gave a talk at a Kiwanis luncheon at the Desert Inn Wednesday, September 1, with 95 members attending. The subject was "The Why of Human Relations".

Training Unit completed move to the second floor of W-10 Building on Tuesday, September 7.

A Project Engineering Sub-unit Supervisor, Pile Technology Unit, Engineering Department, has been selected by his Unit Manager for special training in preparation for his becoming a welding instructor. The Training group will plan a program for him so that he may gain the required techniques in the shortest period of time.

On Wednesday afternoon, September 15, a member of Training gave a talk on "Why of Human Relations" to 33 faculty and staff members of Lewis and Clark School.

During the month, an official of the Richland Public Schools and the Technical Information and Education Officer of Camp Hanford discussed with a Training Representative the possibility of offering a course in speed-reading. The T.I.&E. Officer will conduct a cost survey and another meeting will be called for at a later date.

Fourth-Quarter Training Program Schedule cards were distributed to all exempt personnel during the week of September 13-17.

At the request of Public Relations Section, on Wednesday and Thursday, September 29-30, a member of Training arranged for the showing of two films for the Manager of Advanced Engineering Section, Engineering Department.

Employee and Public Relations  
EDUCATION AND TRAINING

TRAINING (Continued)

At the request of Purchasing and Stores Section, Training Unit arranged for the showing of two films to three exempt members of the Stores Unit on Thursday afternoon, September 22.

A member of Training gave a talk entitled "Here's How", (techniques of sales presentation) to 110 members of the Community Chest on Thursday evening, September 30, at Carmichael School.

Request from other sections during the month were:

Program Attendance Transcripts	61
Business English Reference Sources	15
Let's Talk It Over Interview Sheets	944

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT  
HEALTH & SAFETY SECTION  
SEPTEMBER 1954

General

Personnel Changes

Two additions and eight deletions resulted in a decrease of six.

Employee Relations

Employee attendance at 39 meetings was 225.

Visits

Mr. L. E. Newman, Manager of Health & Safety, General Electric Company, spent two days at the plant and was pleased with the health and safety program here. Dr. Albert, A.E.C., was a visitor also. Dr. Norwood addressed the First Northwest Industrial Health Conference at Portland, Oregon, and the Seventh Southwest Industrial Health Conference at Houston, Texas. Dr. Nesbitt attended the Portland Conference. Dr. Fuqua spoke at the annual meeting of the Washington State Medical Association in Spokane. Mr. Bakko attended the annual meeting of the American Hospital Association in Chicago, while five members of Kadlec's staff attended the annual meeting of the Washington State Hospital Association at Yakima. Mr. McKinnon was a panel participant at this meeting, discussing Hospital Safety. Dr. Sachs attended an executive committee meeting of the Western Branch of the American Public Health Association at Reno, Nevada. The health educator attended a regional Tuberculosis Association meeting in Yakima. A fire prevention engineer attended the National Fire Prevention Association meeting in Seattle.

Industrial Medicine

Medical examinations increased from 923 to 999 while dispensary treatments decreased from 4768 to 4720. Sickness absenteeism was 1.31% as compared with 1.26% for August while total absenteeism was 2.05% as compared with 2.00% for August. The health topic of the month was "Viruses."

Safety and Fire Prevention

One major injury in Operations brought to an end the best safety record ever to be achieved by a General Electric plant. We operated 214 days without a major injury. This represents more than 9,400,000 man hours. No major injuries occurred in the Community sections. Minor injuries continued low.

	<u>Minor</u>			<u>Sub Major</u>			<u>Major</u>		
	Aug.	Sept.	To Date	Aug.	Sept.	To Date	Aug.	Sept.	To Date
Plant	307	272	2696	0	0	17	0	1	4
Community	30	22	203	0	0	0	0	0	1
Plant and Community 1954	337	294	2899	0	0	17	0	1	5
Plant and Community 1953			3173			11			10

Individual orientation in health and safety matters of all newly appointed supervisors by staff members in Industrial Medicine, Safety and Radiation Protection is being enthusiastically received.

HEALTH & SAFETY SECTION

SEPTEMBER 1954

General (Continued)

Kadlec Hospital

The average daily census increased from 57.3 to 61.0 as compared to 78.8 a year ago. While decreased construction activity explains some of the drop, the major portion is unexplained.

The occupancy percentage for the mixed services was 53.6.

Public Health

The communicable disease incidence remained low. Mosquito control operations were terminated for the year.

Costs-August

	<u>July</u>	<u>Aug.</u>	<u>Aug. Budget</u>
Industrial Medicine	\$42,663	\$46,640	\$47,528
Public Health (Oper.)	11,153	10,740	12,391
Kadlec Hospital (Net)	17,461	33,588	26,000
Hospital Expense Credits	1,791	2,825	2,000
Safety & Fire Prevention	<u>18,553</u>	<u>18,821</u>	<u>20,917</u>
Subtotal-Health & Safety (Oper.)	91,621	112,614	108,836
Construction Medical (Industrial and Public Health)	<u>979</u>	<u>1,040</u>	<u>1,143</u>
Total-Operations & Construction	\$92,600	\$113,654	\$109,979

The net cost of operating the Health and Safety Section before charges were assessed to various departments was \$113,654, about \$21,000 more than the July cost and about \$3,700 above the budget.

Major cause for the high cost was the low hospital revenue due to the extremely low August census.

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Industrial Medical Services

The total number of examinations increased from 923 to 999. General Electric employees sustained one major injury and no sub-majors. Contractor employees sustained no majors and three sub-majors. Dispensary treatments decreased from 4768 to 4720. There were twenty-five nurses on the non-exempt roll.

The new medical facilities in the 100-K area were inspected and preparations for beginning services there about November 15th were made.

One information meeting was held during the month for industrial physicians. Mr. L. E. Newman of the New York office, met with industrial physicians for discussion of health and safety problems. One physician attended the Washington State Medical Association meeting in Spokane, read a paper on Industrial Medicine and also attended the committee meetings of the Association on Industrial Health. Dr. Albert of the Division of Medicine and Biology of the A.E.C. was a plant visitor on September 14th.

There have been nine claims to date filed for hearing loss due to noise exposure. Of these eight have been rejected by the Department of Labor and of these, three decisions have been appealed. Hearings on these cases are expected to be held during November or December. Measurements of noise for both intensity and frequency have now been completed throughout the plant and buildings and operations classified as to need for personnel ear protection.

The Health Activities Committee met on September 16th and the topic on "Viruses" was presented. Material on this subject was prepared for distribution throughout the plant.

Sickness absenteeism was 1.31% as compared with 1.26% for August.

Net costs incurred in August amounted to \$38,003, an increase of \$3,463 over the preceding month. Salaries and related continuity of service expense increased \$1,736 primarily as a result of the addition of two industrial physicians to the roll in August. Travel and living expenses were unusually high in August due to the inclusion of nearly \$2,000 in moving expenses for the two physicians who were brought to Richland.

Costs-Operations

	August	July	Increase (Decrease)
Salaries	\$34,505	\$32,912	\$ 1,593
Continuity of Service	3,105	2,962	143
Laundry	331	292	39
Utilities, Transportation, Maintenance	3,489	3,475	14
Supplies and Other	6,320	4,096	2,224
Total Gross Costs	47,750	43,737	4,013
Less: Revenue	1,110	1,074	36
Expense Credits	8,637	8,123	514
Net Cost of Operation	\$38,003	\$34,540	\$ 3,463

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Industrial Medical Services (Continued)

Costs-Operation (Continued)

In relation to the budget at the end of two months' operation, net expenses are \$7,963, or 10% lower than anticipated. Salaries and continuity of service expense are nearly \$2,100 less than budgeted due to there being two persons less on the roll than included in the budget. The remainder of the underrun is attributable to lower than estimated maintenance costs, and greater than estimated charges to other departments for services rendered.

HEALTH & SAFETY SECTION

September 1954

<u>Industrial Medical Services (Continued)</u>	<u>August</u>	<u>September</u>	<u>Year to Date</u>
<u>Physical Examinations</u>			
<u>Operations</u>			
Pre-employment . . . . .	104	77	789
Rehire . . . . .	19	18	229
Annual . . . . .	182	192	2267
Interim . . . . .	238	236	1456
A.E.C. . . . .	35	27	284
Re-examination and recheck . . . . .	158	183	1823
Termination . . . . .	83	130	762
Sub-total . . . . .	819	863	7610
<u>Contractors</u>			
Annual . . . . .	8	36	143
Pre-employment . . . . .	64	6	528
Recheck . . . . .	20	11	265
Termination and Transfer . . . . .	12	83	250
Sub-total . . . . .	104	136	1186
Total Physical Examinations . . . . .	923	999	8796
<u>Laboratory Examinations</u>			
<u>Clinical Laboratory</u>			
Government . . . . .	149	139	1232
Pre-employment, Termination, Transfer . . . . .	1674	1904	14670
Annual . . . . .	951	1063	12395
Recheck (Area) . . . . .	1187	1218	7086
First Aid . . . . .	1	0	65
Clinic . . . . .	309	327	3308
Hospital . . . . .	3727	3961	38122
Public Health . . . . .	0	0	3
Total . . . . .	7998	8612	76881
<u>X-Ray</u>			
Government . . . . .	16	16	147
Pre-employment, Termination, Transfer . . . . .	214	148	1877
Annual . . . . .	464	473	4107
First Aid . . . . .	63	82	760
Clinic . . . . .	235	280	1942
Hospital . . . . .	229	223	2561
Public Health . . . . .	25	3	82
Total . . . . .	1246	1225	11476
<u>Electrocardiographs</u>			
Industrial . . . . .	59	57	626
Clinic . . . . .	1	2	11
Hospital . . . . .	25	27	289
Total . . . . .	85	86	926

HEALTH & SAFETY SECTION

SEPTEMBER 1954

<u>Industrial Medical Services (Continued)</u>	<u>August</u>	<u>September</u>	<u>Year to Date</u>
<u>First Aid Treatments</u>			
<u>Operations</u>			
New Occupational Cases . . . . .	645	367	3684
Occupational Case Retirements . . . . .	1390	1371	11849
Non-occupational Treatments . . . . .	2258	2525	22703
Sub-total . . . . .	4293	4263	38236
<u>Construction</u>			
New Occupational Cases . . . . .	100	90	668
Occupational Case Retirements . . . . .	280	290	1898
Non-occupational Treatments . . . . .	95	77	532
Sub-total . . . . .	475	457	3098
Facility Operators . . . . .	0	0	149
Total First Aid Treatments . . . . .	4768	4720	41483
<u>Major Injuries</u>			
General Electric . . . . .	0	1	5
Contractors . . . . .	0	0	0
Total . . . . .	0	1	5
<u>Sub-Major Injuries</u>			
General Electric . . . . .	0	0	17
Contractors . . . . .	1	1	3
Total . . . . .	1	1	20
<u>Absenteeism Investigation</u>			
Calls Made . . . . .	2	1	34
Employee Personal Illness . . . . .	2	1	26
No. absent due to illness in family . . . . .	0	0	1
No. not at home when call was made . . . . .	0	0	7

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Kadlec Hospital

The average daily adult census increased from 57.3 to 61.0, as compared to 78.8 a year ago. This represents an occupancy percentage of 56.0, broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 53.6; Obstetrical Service 65.7. The minimum and maximum daily census ranged as follows:

	<u>Minimum</u>	<u>Maximum</u>
Mixed Service	20	62
Obstetrical Service	8	20
Total Adult	28	75

The average daily newborn census decreased from 12.7 to 12.1 as compared to 12.3 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	4.31
Obstetrical	3.26
Newborn	2.97

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of August was 2.73. When newborn infants are included, the ratio is 2.24. The substantial decrease in patient census during the month of August accounts for the higher than usual ratio of employees to patients.

The net expense for the operation of Kadlec Hospital for August was \$33,588 as compared to \$17,461 for July. Summary is as follows:

Kadlec Hospital net expense	\$33,588
This is an increase of \$16,127 due to a very substantial decrease in revenue resulting from a sharp decrease in patient census. Gross costs went up slightly as a result of pharmacy items previously purchased being billed and paid in August and coupled with the lowered revenue resulted in the greater net expense.	

Mr. O. E. Bakko attended the annual meeting of the American Hospital Association in Chicago.

Dr. W. D. Norwood, Mr. O. E. Bakko, Mr. E. J. Quigley, Mrs. H. Turner and Miss R. Swift attended the annual meeting of the Washington State Hospital Association in Yakima. Mr. Fred McKinnon was a panel participant in one of the meetings.

Our analysis of the P.A.S. report of feasibility of transferring Kadlec Hospital to community operation and their report of physical plant changes was completed and forwarded to the A.E.C. as had been previously requested by them.

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Kadlec Hospital (Continued)

Following is a summary of employee relations meetings held in the Health and Safety Section during September:

	<u>Meetings</u>	<u>Attendance</u>
Hospital	27	146
Industrial Medicine	4	19
Public Health	4	32
Safety & Fire Prevention	1	13
General	<u>3</u>	<u>15</u>
Total	39	225

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Hospital Unit (Continued)	August	September	Year to Date
<u>Kadlec Hospital</u>			
Average Daily Adult Census . . . . .	57.3	61.0	72.5
Medical . . . . .	16.3	15.2	20.0
Surgical . . . . .	23.0	25.9	29.3
Pediatrics . . . . .	7.1	6.1	10.9
Mixed . . . . .	46.4	47.2	60.2
Obstetrical . . . . .	10.9	13.8	12.3
Average Daily Newborn Census . . . . .	12.7	12.1	11.7
Maximum Daily Census:			
Mixed Services . . . . .	58	62	99
Obstetrical . . . . .	18	20	21
Total Adult Census . . . . .	68	75	116
Minimum Daily Census:			
Mixed Services . . . . .	39	20	20
Obstetrical Service . . . . .	7	8	4
Total Adult Census . . . . .	46	28	28
Admissions: Adults . . . . .	471	491	4831
Discharges: Adults . . . . .	463	491	4829
Medical . . . . .	103	138	1259
Surgical . . . . .	192	191	2004
Pediatrics . . . . .	78	53	747
Mixed . . . . .	373	387	4010
Obstetrical . . . . .	90	104	819
Newborn . . . . .	86	91	735
Patient Days: Adult . . . . .	1777	1830	19781
Medical . . . . .	506	456	5461
Surgical . . . . .	714	778	8000
Pediatrics . . . . .	219	182	2968
Mixed . . . . .	1439	1416	16429
Obstetrical . . . . .	338	414	3352
Newborn . . . . .	399	364	3186
Average Length of Stay: Adults . . . . .	3.8	3.7	4.1
Medical . . . . .	4.9	3.3	4.3
Surgical . . . . .	3.7	4.1	4.0
Pediatrics . . . . .	2.8	3.1	4.0
Mixed . . . . .	3.9	3.7	4.1
Obstetrical . . . . .	3.8	4.0	4.1
Newborn . . . . .	4.0	4.0	4.3
Occupancy Percentage: Adults . . . . .	52.6	56.0	67.8
Medical . . . . .	44.1	41.1	54.1
Surgical . . . . .	71.9	80.9	91.6
Pediatrics . . . . .	37.4	32.1	57.4
Mixed . . . . .	52.7	53.6	68.4
Obstetrical . . . . .	51.9	65.7	58.6
Newborn . . . . .	43.8	46.5	45.0

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

HEALTH & SAFETY SECTION

SEPTEMBER 1954

Hospital Unit (Continued)	August	September	Year to Date
<u>Kadlec Hospital (Continued)</u>			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics . . . . .	4.48	4.31	
Obstetrics . . . . .	4.67	3.26	
Newborn . . . . .	2.80	2.97	
Avg. No. Employees per Patient (excluding newborn) . . . . .	2.73		
Operations: Major . . . . .	70	69	688
Minor . . . . .	91	67	774
E.E.N.T. . . . .	33	47	539
Dental . . . . .	0	1	11
Births: Live . . . . .	79	90	734
Still . . . . .	0	0	6
Deaths . . . . .	2	4	41
Hospital Net Death Rate . . . . .	.18%	.69%	.37%
Net Autopsy Rate . . . . .	50.0	75.0	48.7
Discharged against advice . . . . .	3	5	19
One Day Cases . . . . .	131	147	1351
Admission Sources:			
Richland . . . . .	71.8	68.8	72.1
North Richland . . . . .	11.7	13.7	12.5
Other . . . . .	16.5	17.5	15.4
Admissions by Employment:			
General Electric . . . . .	68.2	65.2	67.7
Government . . . . .	3.6	3.7	3.2
Facility . . . . .	4.9	5.3	5.4
Contractors . . . . .	17.8	20.2	18.2
Schools . . . . .	.8	.8	1.2
Others . . . . .	4.7	4.8	4.8
Hospital Outpatients-F.A. . . . .	612	610	5031
Recovery Bed Patients-F.A. . . . .	0	0	71
<u>Physical Therapy Treatments</u>			
Clinic . . . . .	227	217	2676
Hospital . . . . .	70	76	779
Industrial: Plant . . . . .	217	258	1745
Total . . . . .	514	551	5200
<u>Pharmacy</u>			
No. of Prescriptions Filled . . . . .	2644	2666	43742
No. of Store Orders Filled . . . . .	543	453	4668

HEALTH & SAFETY SECTION

SEPTEMBER 1954

<u>Hospital Unit (Continued)</u>	<u>August</u>	<u>September</u>	<u>Year to Date</u>
<u>Kadlec Hospital (Continued)</u>			
<u>Patient Meals</u>			
Regulars . . . . .	2694	3115	30970
Children under 8 . . . . .	274	256	3463
Specials . . . . .	1083	903	10050
Softs . . . . .	613	497	7010
Tonsils . . . . .	40	59	949
Liquids . . . . .	99	160	1476
Surgical Liquids . . . . .	97	96	892
Total . . . . .	4900	5086	54810
<u>Cafeteria Meals</u>			
Noon . . . . .	1752	1648	16202
Night . . . . .	373	335	2956
Total . . . . .	2125	1983	19158

## HEALTH & SAFETY SECTION

SEPTEMBER 1954

### Public Health

The communicable diseases reported dropped; however, chickenpox incidence remains at the same level. The number of field nursing visits made decreased due to the fact that the nurses are spending scheduled hours in school.

A quarterly Tuberculosis Clinic was held. A Handicapped Children's Clinic was conducted by C. Don Platner, M.D., consulting orthopedist.

The Health Educator attended a regional tuberculosis meeting at Yakima. The Health Officer attended an executive committee meeting of the Western Branch of the American Public Health Association at Reno, Nevada.

Conferences were held in terms of services to crippled children with representatives of the Richland School District, Benton-Franklin County Health Department and the Richland Public Health Unit.

Of the 272 social service consultations held, 105 were concerned with problems in relationship between parents and their children. Eighty-two were directly focused on marital discord. Individual emotional and personality problems were taken up in 67 instances, 32 of these being with young children, 16 with adolescents, and 19 with adults. Problems arising from physical and/or mental illness were treated in 18 interviews. One interview was devoted to discussion of a financial problem.

In conjunction with the routine inspection of food handling establishments, swab rinse tests were run on various utensils. Results indicated most are doing a satisfactory job of sterilizing eating and drinking utensils. Approved methods were demonstrated in those in which poor results were obtained, and re-checks were made with satisfactory results. Bakeries were found to be operating satisfactorily from the sanitation standpoint.

Forty Grade A dairy farms were inspected. Two producers were degraded as a result of continued high bacteria counts. Bacteriological examination of pasteurized milk samples showed satisfactory results.

Water samples from parochial school proved negative for coliform bacteria.

Ten rabies investigations were made during the month.

Mosquito control operations were terminated. Five hundred gallons of spray material was utilized. Spray equipment has been dismantled and trucks returned to transportation division.

HEALTH & SAFETY SECTION

SEPTEMBER 1954

<u>Public Health (Continued)</u>	<u>August</u>	<u>September</u>	<u>Year to Date</u>
<u>Education</u>			
Pamphlets distributed . . . . .	11,002	10,990	110,181
News Releases . . . . .	6	32	125
Staff Meetings . . . . .	2	0	10
Classes . . . . .	8	6	132
Attendance . . . . .	30	25	3,098
Lectures & Talks . . . . .	2	3	45
Attendance . . . . .	50	66	2,096
Films Shown . . . . .	4	1	92
Attendance . . . . .	51	6	3,491
Community Conferences & Meetings . . . . .	29	30	242
Radio Broadcasts . . . . .	9	10	77
<u>Immunizations</u>			
Diphtheria . . . . .	27	6	69
Diphtheria Booster . . . . .	4	0	244
Diptussis Booster . . . . .	0	0	2
Tetanus . . . . .	27	6	70
Tetanus Booster . . . . .	4	0	243
Pertussis . . . . .	11	6	47
Pertussis Booster . . . . .	4	0	242
Smallpox . . . . .	2	0	180
Smallpox Revaccination . . . . .	1	0	591
Tuberculin Test . . . . .	7	0	19
Immune Globulin . . . . .	31	8	793
Other . . . . .	0	0	4
<u>Social Service</u>			
Cases carried over . . . . .	99	96	844
Cases admitted . . . . .	9	17	151
Cases closed . . . . .	12	12	136
Remaining case load . . . . .	96	101	859
Activities:			
Home Visits . . . . .	10	2	64
Office Interviews . . . . .	266	270	2,712
Conferences . . . . .	30	40	410
Meetings . . . . .	10	9	73
<u>Sanitation</u>			
Inspections made . . . . .	161	160	1,257
Conferences held . . . . .	9	8	138
<u>Bacteriological Laboratory</u>			
Treated Water Samples . . . . .	256	185	1,812
Milk Samples (Inc. cream & ice cream) . . . . .	15	30	320
Other bacteriological tests . . . . .	375	402	4,915
Total . . . . .	646	617	7,047

HEALTH & SAFETY SECTION

SEPTEMBER 1954

<u>Public Health (Continued)</u>	<u>August</u>	<u>September</u>	<u>Year to Date</u>
<u>Communicable Diseases</u>			
Chickenpox . . . . .	14	14	304
German Measles . . . . .	8	5	50
Gonorrhea . . . . .	1	0	1
Impetigo . . . . .	1	3	7
Influenza (H.R.I.) . . . . .	0	0	4
Infectious Mononucleosis . . . . .	0	0	1
Infectious Hepatitis . . . . .	1	2	15
Measles . . . . .	12	1	1,379
Meningitis . . . . .	1	0	1
Mumps . . . . .	7	2	38
Pinkeys . . . . .	0	0	6
Polio-myelitis . . . . .	1	2	4
Ringworm . . . . .	0	2	8
Roseola . . . . .	2	3	11
Scabies . . . . .	0	0	1
Scarlet Fever . . . . .	1	2	65
Streptococcal Infections-Throat . . . . .	0	1	4
Syphilis . . . . .	1	0	1
Tuberculosis . . . . .	0	1	2
Whooping Cough . . . . .	9	0	69
Total . . . . .	59	38	1,971
Total No. Nursing Field Visits . . . . .	597	459	5,677
Total No. Nursing Office Visits . . . . .	69	33	814

COMMUNITY SECTION

SEPTEMBER 1954

ORGANIZATION AND PERSONNEL:

	<u>BEGINNING OF MONTH</u>		<u>END OF MONTH</u>	
	<u>Exempt</u>	<u>Nonexempt</u>	<u>Exempt</u>	<u>Nonexempt</u>
Community Administration	1	1	1	1
Maintenance & Renovation Unit	11	143	9	143
Police Unit	17	31	17	28
Commercial & Residential Property Unit	9	22	8	23
Fire Unit	67	0	67	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
Recreation Unit	2	3	2	2
Water & Sewerage Utilities Unit	4	22	4	21
Library Unit	4	9	4	9
Public Works Unit	<u>5</u>	<u>52</u>	<u>5</u>	<u>35</u>
	134	305	131	284

	<u>Exempt</u>	<u>Nonexempt</u>
Additions to Payroll	0	6
Removals from Payroll	0	12
Transfers In	0	2
Transfers Out	3	17
Net Decrease <u>24</u>		

MAINTENANCE AND RENOVATION UNIT

	<u>Exempt</u>	<u>Nonexempt</u>
Employees - Beginning of the month	11	143
Transferred in	0	3
Transferred out	2	5
Leave of absence - deactivate	0	1
New hires	0	4
Terminations	0	1
Total employees - end of month	9	143

REMARKS:

The Exterior Paint Report has been changed to cover the period of fiscal year rather than calendar year so as to coincide with budgets.

Gga-1

1215429

EXTERIOR PAINT REPORT

P. Y. 1955

<u>FOREMAN</u>	<u>PAINTERS</u>	<u>TRUCK DRIVERS</u>	<u>TOTAL</u>
Chambliss	24	1	25
Lukins	24	1	25
Tappan	<u>13</u>	<u>1</u>	<u>14</u>
Total	61	3	64

<u>TYPE UNIT</u>	<u>NO. UNITS SCHEDULED</u>	<u>COMPLETED THIS MONTH</u>	<u>COMPLETED TO DATE</u>	<u>BALANCE TO BE PAINTED</u>
A	264	60	132	132
B	188	30	127	61
D	2	0	0	2
E	22	1	14	8
F	69	5	51	18
G	3	0	0	3
H	96	9	89	7
L	40	9	22	18
Tract	16	5	7	9
Dormitories	23	0	0	23

---

Total	723 (1175)	119	442	281
-------	---------------	-----	-----	-----

Est. MH B. F.	16,706	Actual MH B. F.	15,703
Est. MH This Mo.	<u>6,936</u>	Actual MH This Mo.	<u>6,534</u>
Total Est. MH	23,642	Total Actual MH	22,237

Total Season Estimate      42,232

Gga-2

1215030

INTERIOR PAINT REPORT - FY 1955

<u>FOREMAN</u>	<u>PAINTERS</u>	<u>TRUCK DRIVERS</u>	<u>TOTAL</u>
Chambliss	24	1	25
Lukins	23	1	24
Tappan	<u>12</u>	<u>1</u>	<u>13</u>
Total	59	3	62

For period: 7-4-54 through 10-3-54

<u>TYPE UNIT</u>	<u>NO. UNITS SCHEDULED</u>	<u>COMPLETED THIS PD.</u>	<u>COMPLETED TO DATE</u>	<u>BALANCE TO BE PAINTED</u>
A	128	3	3	125
B	152	5	5	147
C	8	0	0	8
D	0	0	0	0
E	23	0	0	23
F	52	0	0	52
G	0	0	0	0
H	91	0	0	91
K	2	0	0	2
L	13	0	0	13
M	1	0	0	1
Q	2	1	1	1
R	1	0	0	1
S	1	0	0	1
T	0	0	0	0
U	20	2	2	18
V	77	2	2	75
Y	95	2	2	93
Z	6	0	0	6
LBP	91	4	4	87
2BP	442	16	16	426
3BP	291	4	4	287
Tract	16	0	0	16
1BR Apt.	10	1	1	9
W-13 Apt.	2	0	0	2
2BR Apt.	0	0	0	0

Est. MH This Pd. 1689

Actual MH This Pd. 1716

PLUMBING SHOP

FOREMAN - H. F. BERNDT

<u>JOB DESCRIPTION</u>	<u>NO. COMPLETED</u>
Electric water heaters replaced	10
Laundry tubs replaced	37
Shower stalls replaced	2
Plumbing work orders completed	45
Plumbing for floor and sink replacement	56
Cleared major sewer stoppages caused by tree roots	50
Steam work orders completed	18
Made steam inspection each week on Government owned commercial buildings, dormitories and apartments.	
Excavated sewer lines, water lines, and all leaking or broken underground piping with backhoe machine so repairs could be made.	
Replaced street steps	41
Turned on heating steam in all apartments, dormitories and Government owned commercial buildings.	
Service orders	4 Hrs.

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	204
B. Received during the month	1754
C. Completed during the month	1783
D. On hand at the end of the month	175

E. A total of 712 hours were expended on work orders.

F. Roof coating:

Completed 43 conventional house roofs

Completed 20 pump house roofs

G. Backlog of service orders by craft:

Plumbing	152
Electrical	7
Carpentry	16
Roofing	None

RENOVATION AND LABOR CREW

FOREMAN - B. C. BAIN

The following services were performed during the month:

Vacant houses renovated	34
Vacant house interiors completely painted	6
Trash pickups	40 locations
Minor carpenter repairs	41 houses
Minor carpenter repairs to dormitories	6 rooms

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	154
Routine furnace inspections	310
Cooler calls (dormitories, clinic, etc.)	20
Weep tubes	1000

B. Sheetmetal Crew:

Replacement of shower stalls	4
Replacement of gutters	12
Installed flashing around ranch house coal hatches	6
Installed flashing - precuts	7
Repaired ladders	9

The heat ducts have been replaced in the Community House attic with sheet metal. The transite ducts and plenum chambers were completely torn out.

C. Truck Drivers and Servicemen:

Tree removal orders	32
Top soil delivered	6
Sidewalk removals	8

LINOLEUM AND CARPENTER SHOP

FOREMAN - R. M. MARTIN

<u>JOB DESCRIPTION</u>	<u>NO. COMPLETED</u>
Replaced bath wall tile	2
Repaired bath wall tile	3
Replaced bath floor linoleum	3
Repaired bath floor linoleum	1
Replaced kitchen floor linoleum	21
Repaired kitchen floor linoleum	5
Repaired floor tile - noncommercial facility	1
Repaired floor tile - commercial facilities	5
Replaced step and landing linoleum	3
Replaced bedroom linoleum	3
Repaired bedroom linoleum	1
Replaced kitchen sink top linoleum	63
Repaired kitchen sink top linoleum	7
Replaced work bench linoleum	6
Drilled weepholes	3
Replaced sash balances	3
Repaired window screens - Ranch houses	14
Repaired door - commercial facility	1
Repaired roofs - houses	5
Raised slab	4
Repaired porches	141
Repaired siding	1
Repaired exterior doors - Shop	3
Repaired interior doors - Shop	4
Jack and shim	10
Repaired wall	3
Repaired basement wall	1
Repaired floor boards	5
Repaired thresholds	4
Sidewalk forms	3
Repaired chimney	1
Checkpoint - routine	32
Checkpoint - work orders	58
Paint touch ups	51
Interior carpenter repairs - houses	32

COMMUNITY SECTION  
 RICHLAND POLICE DEPARTMENT  
 MONTHLY REPORT  
 SEPTEMBER 1954

**ORGANIZATION**

	Exempt	Non-Exempt
Employees - Beginning of Month	17	31
Transfers In	0	0
Transfers Out	0	2
New Hires	0	0
Terminations	0	1
Total - End of Month	17	28

**GENERAL**

Chief H. W. Strock attended the 61st annual International Association of Chiefs of Police Conference held in New Orleans from September 26 through September 30.

The fourth annual Police Athletic League banquet honoring the PAL's Little League baseball team was held at the Desert Inn on September 27. Guest speakers included Mr. D. F. Shaw, A.E.C. Manager of the Hanford Operations Office, Rev. Holly Jarvis, E. J. Corcoran, Commissioner of Richland Little League baseball, J. C. Bloom, President of the Columbia Little League, and Lt. A. F. Novotny, Athletic Manager of the PAL.

Four hundred "Drive Carefully, School is Starting" placards were distributed during the month of September.

Two new films entitled "Name Unknown" and "Dangerous Stranger", dealing with child behavior upon being approached by strangers, were purchased during the month of September.

TRAFFIC	1954		1953		1954	1953
	Aug.	Sept.	Aug.	Sept.	Total To Date	Total Same Period
Reportable accidents	23	20	17	13	177	175
Property damage accidents	19	18	12	10	153	148
Injury accidents	4	2	5	3	24	26
Total persons injured	4	2	5	3	24	34
Fatal accidents	0	0	0	0	0	1
Accidents-daylight hours	16	15	13	10	126	123
-darkness	7	5	4	3	51	52
Accidents-business district	2	9	6	1	49	63
residential	14	8	9	10	99	88
other	7	3	2	2	29	24
Accidents investigated	17	16	14	12	113	117
Criminal complaints filed	14	13	9	10	85	93
Violations contributing to accidents:						
Negligent driving	4	5	0	0	33	19
Fail. to yield r.o.w.	8	6	8	8	55	67
Following too closely	1	4	2	0	30	27
Drunk driving	0	0	2	0	2	5
Pedestrian violation	2	1	0	0	6	3
Inattention to driving	1	1	1	2	2	4
Reckless driving	2	0	0	0	5	4
Speeding	0	0	2	0	1	5
Unsafe speed	1	0	0	0	21	8
Improper backing	1	0	0	0	8	10
Disregarding stop sign	1	1	0	0	2	4
Hit and run	0	0	0	0	0	1
Improper passing	1	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	0	1	0
Wrong side of road	0	0	0	0	0	1
Improper parking	1	0	0	0	1	0
Bicycle violation	1	0	1	0	3	1
Asleep at wheel	0	0	1	0	0	1
Defective equipment	0	1	0	2	1	2
Dog in street	0	0	0	1	0	1
Debris on highway	0	1	0	0	1	0
North Richland:						
Reportable accidents	7	16	4	7	76	73
Property damage accidents	6	15	4	7	65	61
Injury accidents	1	1	0	0	11	12

Richland	1954		1954		1953	
	Aug.	Sept.	Ave. Per Accident Aug.	Accident Sept.	Ave. Per Accident Aug.	Accident Sept.
Accident property damage	\$4,414.62	\$5,189.00	\$191.94	\$259.45	\$304.41	\$270.12

1215733

1215331

**TRAINING**

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction was as follows:

38 Caliber Revolver	1/2 Hour	Qualifications on the Army-L Course as follows:	
Total number of men reporting at the range	9	Marksmen	3 33%
Number of men fired over the Army-L Course	9	Expert	0
		Sharpshooter	5 55%
		Unqualified	1 12%

**ACTIVITIES AND SERVICES**

	August		September	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	4	5	2	4
Bicycles impounded	1	0	11	0
Bicycle violations	1	3	0	0
Bicycles registered	60	0	57	0
Children lost or found	15	2	15	4
Complaints investigated (no enforcement action)	45	6	27	8
Deaths reported	0	0	0	1
Dog, cat, loose stock complaints	0	3	6	0
Dogs, cats, reported lost or found	5	4	8	1
Doors, windows found open in facilities	42	6	52	12
Emergency messages delivered	11	98	9	95
Fires investigated	7	3	3	2
Guns registered	16	0	18	0
Law enforcement agencies assisted	7	0	3	1
Letters of inquiry	137	0	156	0
Miscellaneous escorts	5	1	15	1
Persons injured by dogs	2	0	4	1
Plant departments assisted	15	0	23	2
Prisoners processed through Jail	17*	18	14	11
Private individuals assisted	30	2	15	1
Property lost or found	12	1	17	2
Records inquiries	88	0	85	0
Reports processed through Records	251	161	289	170
Street lights out reported to Electrical	114	20	111	18
Traffic safety meetings (Sept. attendance - 425)	6	0	12	0
<b>Total</b>	<b>891</b>	<b>333</b>	<b>952</b>	<b>334</b>

\*Two prisoners handled for the Security Patrol during August.

MONTHLY REPORT  
 RICHLAND POLICE DEPARTMENT  
 (RICHLAND - NO. RICHLAND)  
 SEPTEMBER 1954

OFFENSES	KNOWN Rich. No. Rich.	UNFOUNDED Rich. No. Rich.	CLEARED OTHER* Rich. No. Rich.	CLEARED ARREST Rich. No. Rich.
1. Criminal Homicide	1	-	-	-
2. Murder & Non-Neg. Mans.	4	-	-	-
3. Mans. by Negligence	20	1	-	-
4. Rape	1	1	1**	1
5. Robbery	26	2	1	1
6. Aggravated Assault				
7. Burg.-Break. & Entry				
8. Larceny Over \$50.00				
9. Larceny Under \$50.00				
10. Auto Theft				
TOTAL PART I CASES	13	2	1	2

PART II

11. Other Assaults	1	-	-	1
12. Forgery & Counterfeit	2	-	1	1
13. Embezzlement & Fraud	3	-	1	2
14. Stolen Prop;Buy;Rec.	-	-	-	-
15. Weapons;Carry;Poss.	-	-	-	-
16. Prostitution	-	-	-	-
17. Sex Offenses	1	-	-	1
18. Offenses Ag. Fam. & Child	-	-	-	-
19. Narcotics	-	-	-	-
20. Liquor Laws	-	-	-	-
21. Drunkenness	6	-	-	4
22. Disorderly Conduct	5	-	2	5
23. Vagrancy	-	-	-	-
24. Gambling	-	-	-	1
25. Driving While Intoxicated	5	-	-	3
26. Viol. Rd. & Dr. Laws:				
27. Fail. to Stop & Identify	4	-	-	2
28. Speeding	26	-	-	26
29. Stop Sign	31	-	-	30
30. Reckless Driving	5	-	-	5
31. Right of Way	9	-	-	9

OFFENSES	KNOWN		UNFOUNDED	CLEARED OTHERS*		CLEARED ARREST	
	Rich.	No. Rich.		Rich.	No. Rich.	Rich.	No. Rich.
PART II							
Negligent Driving	18	15	-	-	18	15	-
Defective Equipment	5	6	-	-	5	4	-
Illegal Passing	1	5	-	-	1	5	-
Parking	10	58	-	-	10	58	-
All Other Traff. Viol.	17	4	-	-	15	4	-
All Other Offenses:							
Mal. Mischief	4	1	-	9	-	1	-
Vandalism	1	6	-	-	1	-	-
Bike Violations	11	-	-	11	-	-	-
Public Nuisance	2	-	-	-	2	-	-
Investigation	7	1	-	6	1	-	-
Prowler	4	-	-	-	1	-	-
Disturbance	1	-	-	1	-	-	-
Pickup for Outside Ag.	1	-	-	-	1	-	-
Damage to Property	1	-	-	1	-	-	-
Illegal Shooting	4	-	-	4	-	-	-
Obscene Phone Call	2	-	-	1	-	-	-
Molesting	2	-	-	-	-	-	-
Neighborhood Dist.	2	-	-	2	-	-	-
Cont. to Delq. of Minor	-	1	-	-	-	1	-
Suspicion	-	-	-	-	-	-	-
TOTAL PART II	184	140	-	36	139	131	-
PART III							
Missing Persons	4	1	-	4	1	-	-
Lost Persons	17	7	-	17	7	-	-
Lost Animals	5	-	-	2	-	-	-
Lost Property	19	1	-	12	-	-	-
Found Persons	-	-	-	-	-	-	-
Found Animals	5	-	-	-	-	-	-
Found Property	16	-	-	7	-	-	-
TOTAL PART III	66	9	-	42	8	-	-

1215139

OFFENSES

KNOWN  
Rich. No. Rich.      UNFOUNDED  
Rich. No. Rich.      Rich. No. Rich.  
 CLEARED OTHER\*      CLEARED ARREST  
Rich. No. Rich.      Rich. No. Rich.

PART IV

30. Fat.M.V.Tr. Acc.	-				
31. Pers.Inj.M.V.Tra.Acc.	2	1			
32. Prop.Dem.M.V.Acc.	18	15			
33. Other Traffic Acc.					
34. Public Accidents					
35. Home Accidents					
36. Occupational Acc.					
37. Firearms Accidents					
38. Dog Bites	4	1			
39. Suicides					
40. Suicide Attempts	-	-			
41. Sud. Death & Bod. Found	-	1			
42. Sick Cared For	-	-			
43. Mental Cases	-	-			

} No Accurate Statistics Kept

TOTAL PART IV

24      18

COMPOSITE TOTALS

PART I, II, III, IV CASES      300      180      2      1      78      14      141      132

\*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. \*\* One Auto Theft cleared for previous month.

Property reported stolen Richland \$1,394.65  
 Property reported stolen No. Rich. \$ 507.95  
 Property recovered Richland \$1,086.70  
 Property recovered No. Rich. \$ 300.00

1215441

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 August	1954 September
Murder	468	.078	1	-	-
Robbery	12,925	2.154	-	-	-
Agg. Assault	13,100	2.183	-	-	-
Burglary	80,750	13.458	19	-	1
Larceny	228,430	38.072	91	18	24
Auto Theft	40,380	6.730	6	2	1

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 August	1954 September
Murder	378	.063	1	-	-
Robbery	7,900	1.317	-	-	-
Agg. Assault	2,280	.380	-	-	-
Burglary	69,550	11.590	19	-	1
Larceny	211,700	35.283	91	18	24
Auto Theft	38,950	6.491	6	2	1

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953 July	Richland 1954 August
Robbery	-	-
Burglary	22%	-
Larceny	18%	4%
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.)	1953		1954	
		One Month Average	July - Dec.	August	September
Murder	.187	.032	-	-	-
Robbery	5.170	.862	-	-	-
Agg. Assault	4.240	.707	-	-	-
Burglary	32.300	4	-	-	-
Larceny	91.370	60	15	10	10
Auto Theft	16.150	13	1	1	3

1215442

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.)	1953		1954	
		One Month Average	July - Dec.	August	September
Murder	.227	.038	-	-	-
Robbery	3.160	.527	-	-	-
Agg. Assault	.910	.152	-	-	-
Burglary	27.820	4.637	4	-	-
Larceny	84.680	14.113	60	15	10
Auto Theft	15.580	2.597	13	1	3

68-8

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland		No. Richland	
	1953	1954	August	September
Robbery	-	-	-	-
Burglary	-	-	-	-
Larceny	19%	66%	66%	33%
Auto Theft	20%	100%	100%	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**      **SEPTEMBER**

OFFENSES	NO. CASES	JUVENILES	SEX	6	9	11	12	13	14	15	16
<b><u>RICHLAND</u></b>											
Investigation	1	3	M		2		1				
Juveniles Drinking	2	4	M								4
		2	F								2
Malicious Mischief	2	4	M			2	1	1			
Larceny	1	1	M				1				
Illegal Shooting	4	8	M			1	4	1	2		
Vandalism	2	3	M		1	1	1				
Prowler	1	1	M							1	
<b>TOTALS</b>	<b>13</b>	<b>26</b>			<b>3</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>6</b>

<b><u>NORTH RICHLAND</u></b>											
Attempted Car Theft	1	1	M							1	
Vandalism	2	1	F	1							1
		1	M								1
<b>TOTALS</b>	<b>3</b>	<b>3</b>		<b>1</b>							

1215444

RICHLAND POLICE DEPARTMENT  
 RICHLAND JUSTICE COURT CASES  
 SEPTEMBER 1954

VIOLATIONS	NO OF CASES CONV.	NO OF FORP.	NO OF CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUBP.	LIC. SUBP. OR REV.	CASES ORIG. MON.	BAIL FORP.	FINES	FINES SURP.
Defective Equipment	9	5	1	1	1			3	1	\$ 20.00	\$ 40.00	\$ 12.50
Drunk Driving	5	3	1	1							157.50	
Excessive Noise	1	1									10.00	
Fail. to Obey Officer	1	1								7.50	7.50	7.50
Fail to Set Brakes	2	1								7.50	7.50	7.50
Fail to Stop & Identify	1	1										
F.T.Y.R.O.W.	10	8	1	1						25.00	35.00	27.50
Following too Close	1	1									122.50	
Hit & Run	1	1									12.50	10.00
Illegal Passing	2	2									10.00	10.00
Inattention to Driving	2	2									15.00	
Improper Turn	3	3									17.50	7.50
Improper Plates	2	2									13.00	
Negligent Driving	21	13	3	1				1	1	20.00	247.50	27.50
Invalid Drivers License	14	8	1					1	1	110.00	42.00	8.50
No Registration	1	1								27.50	5.00	
Parking	10	5								17.50	17.50	3.50
Speeding	28	14	2						2	127.50	132.50	
Stop Sign	33	17	2						1	130.00	112.50	27.50
Reckless Driving	6	5	1					4	1		182.50	10.00
Unattend. Veh. v/Mot.Run.	1	1										
Public Nuisance	4	2	1							15.00	25.00	12.50
Public Intoxication	5	1	4							50.00	12.50	
Third Degree Assault	1	1		1								
TOTAL	164	94	52	15	3			8	6	\$550.00	\$1217.50	\$162.00

One Drunk Driving Case Amended to Reckless Driving, Liquor Involved.  
 One Negligent Driving Case Amended to Speeding.

RICHLAND POLICE DEPARTMENT  
NORTH RICHLAND JUSTICE COURT CASES  
SEPTEMBER 1954

VIOLATION	NO OF CASES		NO OF CASES		WARR. SENT		JAIL		SENT		LIC. CASES		BAIL		FINES	
	CONV.	NO OF FORF.	CONT.	DIEM.	ISS.	JAIL	SUSP.	REV.	ORIG.	PREV.	MON.	FORF.	FINES	SUSP.	FINES	SUSP.
Defective Equipment	8	7	1							2		\$ 7.50	\$45.00	\$ 7.50		
Drunk Driving	1	1											77.50			
F.T.Y.R.O.W.	2	1										25.00	12.50			
Illegal Passing	4	3	1									10.00	17.50	12.50		
Improper Turn	1	1											7.50			
Leaving Scene of Acc.	1															
Negligent Driving	15	12								1		92.50	307.50	57.50		
No Driver's License	19	13	1							1		26.00	98.50	10.00		
No Registration	2	2											10.00			
Parking	64	3										154.00	10.50			
Speeding	26	12										144.00	90.00			
Stop Sign	10	4										52.00	22.50	7.50		
Reckless Driving	5	4											150.00	7.50		
Cont. to Del. of Minor	1															
Malicious Mischief	2	2											30.00			
Petit Larceny	2															
Public Intoxication	4															
Public Nuisance	1	1														
Third Degree Assault	1	1														
Vagrancy	1	1														
<b>TOTAL</b>	<b>170</b>	<b>66</b>	<b>78</b>	<b>20</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>\$561.00</b>	<b>\$894.00</b>	<b>\$102.50</b>				

One Reckless Driving Case Amended to Negligent Driving.  
One Drunk Driving Case Amended to Negligent Driving, Liquor Involved.

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS  
SEPTEMBER 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	August	Sept.	August	Sept.	August	Sept.	August	Sept.
Richland	23	20	0	0	0	0	4	2
North Richland	7	16	0	0	0	0	1	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield		Reckless & Drunken		Other Causes	
	August	Sept.	August	Sept.	August	Sept.	August	Sept.
Richland	4	5	8	6	2	0	9	9
North Richland	1	5	1	4	1	1	5	6

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other Viol.		Totals	
	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.
Richland	0	0	0	1	0	0	0	0	1	0	2	0	1	3
North Rich.	0	0	0	0	1	0	0	0	0	2	0	0	1	2

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way		Neg. Drv.		Parking VI.		Totals	
	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.
Rich.	23	26	15	32	4	6	7	6	4	10	17	21	4	10	38	39
N. Rich 15	15	24	11	9	2	2	5	5	2	2	17	15	29	64	25	32

24 HOUR AVERAGE TRAFFIC VOLUME COUNT FOR THE WEEK ENDING SEPTEMBER 17th WAS 3,721 VEHICLES ON THE BY-PASS NORTH OF VAN CIESEN

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY.

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT  
COMMUNITY SECTION  
September, 1954

PERSONNEL - COMMERCIAL & RESIDENTIAL PROPERTY UNIT:

	<u>September</u>	
	<u>Exempt</u>	<u>Non-Exempt</u>
Beginning of Month	8	22
End of Month	8	23
Net Change	0	/1

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>	
	<u>North</u>		<u>North</u>		<u>North</u>	
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>
August	1,646	199	120	1	1,766	200
September	<u>1,642</u>	<u>178</u>	<u>120</u>	<u>1</u>	<u>1,762</u>	<u>179</u>
Net Change	-4	-21	0	0	-4	-21

SUMMARY OF ROUTINE ITEMS PROCESSED:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>		
	<u>North</u>		<u>North</u>		<u>North</u>		<u>Total</u>
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	
Work Orders	36	17	1	0	37	17	54
Back Charges	3	0	0	0	3	0	3
FY Work Orders	675	246	26	0	701	246	947
FY Back Charges	32	1	4	0	36	1	37

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Supplemental Agreements:

- a. National Bank of Commerce of Seattle - to provide for revised rental and makes certain other changes necessary in connection with re-negotiation of the basic lease.
- b. Richland Thrifty Drugs, Inc. - to provide for a new rental and make certain other changes in connection with renegotiation of the basic lease.

1215407

## 2. Business Development:

- a. Advertisements inviting inquiries on the space formerly occupied by Klopfensteins, Inc. at 615 George Washington Way, which has been made available for lease, were placed in nine Northwest newspapers.
- b. Invitations were mailed to twenty-eight prospective Lessees in connection with leasing the government-owned building formerly occupied by Safeway Stores, Inc. Proposals are to be opened and read on October 5, 1954.
- c. Invitations were mailed to four additional prospective Lessees in connection with leasing the government-owned building located at 89 Lee Boulevard. One proposal was received and it was opened and read September 29, 1954.
- d. One proposal was received in answer to our Invitation to Bid, dated June 11, 1954, in connection with the development of the land area located north of Symons Street. This proposal was opened and read on September 15, 1954.

## B. Noncommercial:

## 1. Supplemental Agreement:

Richland Labor Temple Association, Inc. - to provide for an adjustment in the amount payable for utilities and services furnished by General Electric Company.

GENERAL:

## A. Commercial:

1. Dr. Edgar W. Warren terminated his lease in connection with leasing of space in the Medical-Dental Building.
2. The Operating Agreement dated March 14, 1945, with Klopfenstein's, Inc., in connection with the operation of a clothing store in the government-owned building located at 615 George Washington Way was cancelled by mutual agreement of the parties.
3. Jimmy Walsh, d/b/a Richland Tire Exchange opened for business at 737 Stevens Drive.
4. Carl Geer, d/b/a Geer's TV & Appliance, formerly located in the Automatic Laundry Co. Building, opened for business in the Uptown Investment Co. Building, at 1386 Jadwin Avenue.
5. Mrs. Mable Lee French, opened a visual aid training center in the Automatic Laundry Co. Building located at 243 Symons Street.
6. Mayo Goffard terminated his sublease agreement with Automatic Laundry Co. in connection with the operation of a piano instruction studio.
7. Campbell's TV & Appliance terminated its sublease agreement with Automatic Laundry Co.

8. Final Inspection by Community Engineering was received on the Safeway Stores, Inc. building located at 639 Cullum Avenue.
9. Selden's, Inc., terminated its sublease agreement with Uptown Investment Co., at 1386 Jadwin Avenue.
10. Dr. Edward B. Payne, terminated his lease in connection with leasing of space in the Medical-Dental Building.
11. Hand's Buy-Rite Drugstore terminated their lease on their North Richland Facility effective September 21, 1954.
12. Richland Thrifty Drugs, Inc., was awarded a lease on approximately 3,600 square feet of space in Building 13, North Richland, to be used for the operation of a drugstore. This Facility is now open for business.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland and North Richland.

<u>Richland</u>	<u>North Richland</u>
Tavern	Mobile Sandwich Unit
Service Stations	
Photography Developing Shop	
Mobile Sandwich Unit	

1215050

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION

September, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial:

SEPTEMBER

AUGUST

	AUGUST			SEPTEMBER		
	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	37	9	46	36	10	46
b. Number of Sublessee Businesses	<u>17</u>	<u>0</u>	<u>17</u>	<u>17</u>	<u>0</u>	<u>17</u>
c. Total Businesses in Government-Owned Buildings	54	9	63	53	10	63
2. Doctors and Dentists in Private Practice	34	0	34	32	0	32
3. Number of Privately-Owned Buildings	68	7	75	68	6	74
a. Number of Prime Lessee Businesses	43	6	49	44	6	50
b. Number of Businesses operated by Sublessees	<u>111</u>	<u>1</u>	<u>112</u>	<u>110</u>	<u>0</u>	<u>110</u>
c. Total Businesses in Privately-Owned Buildings	154	7	161	154	6	160
4. Privately-Owned Buildings under Construction	4	2	6	3	2	5
5. Total Number of Businesses in Operation	208	16	224	207	16	223

12 15 55 1

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION

September, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

B. Noncommercial:

	<u>AUGUST</u>			<u>SEPTEMBER</u>		
	<u>North</u>		<u>Total</u>	<u>North</u>		<u>Total</u>
	<u>Richland</u>	<u>Richland</u>		<u>Richland</u>	<u>Richland</u>	
1. Government-Owned Buildings						
a. Churches	2		2	2		
b. Clubs and Organizations	5		5	5		
c. Government Agencies	2		2	2		
			<u>9</u>			<u>9</u>
Total						
2. Privately-Owned Buildings						
a. Completed and in use	10	1	11	16	2	12
b. Under Construction	6	2	8	6	0	6
			<u>19</u>			<u>18</u>
Total						
3. Church Plots and Buildings in Private Ownership	2		2	2		2
4. Pasture Land Permits						104

g  
c  
j

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

PROGRESS REPORT

	Orders incomplete as of August 31, 1954	Orders issued 8-31 to 9-30	Total orders Incomplete as of September 30, 1954
Service orders	460	1914	431
Work orders	701	401	531
Service charges		221	

<u>Principal work order loads</u>	Incomplete as of August 31, 1954	Incomplete as of September 30, 1954
Laundry tub replacement	43	87
Tileboard bathroom	15	11
Kitchen floor linoleum	81	96
Kitchen cabinet linoleum	89	87
Shower stall	0	10

173 alteration permits were issued, as compared to 159 issued in August.

Install air conditioner	2	Install automatic dryer	40
Install automatic washer	21	Convert to oil	40
Install fence	9	Basement excavation	6
Install stoker	8	Sand floors	2
Install new circuits	7	Install patio	6
Remove basement partitions	3	Remove laundry trays	1
Install driveway	3	Install door	3
Install window	2	Install fireplace	1
Install closet	1	Install tool shed	3
Reverse range and refer	1	Remove closet and shelves	5
Install linoleum	1	Install TV antenna	1
Install furnace humidifier	1	Raise threshold	1
Install porch roof	2	Install porch lite	1
Soundproof walls	1	Install fuse box	1

798 inspections were made, as compared to 629 made in August.

Alteration permits	14	Basement	2
Bathroom	4	Doors	3
Fill	3	Floorboards	5
Laundry trays	4	Linoleum	75
Lot lines	1	Paint	155
Porch & steps	15	Recall range & refers	15
Shower stalls	7	Screens	3
Sidewalk	27	Shakes	5
Sink	2	Toilet seat	7
Trees	13	Walls	1
Yard	5	Renovation rechecks	28
Dormitories	84	Miscellaneous	47
Cancellations	89	Renovations	95
Shows (new tenants)	89		

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

TENANT STORES

<u>Merchandise Issued</u>	<u>Total Amount</u>
Shades	604
Reflectors	8
Drip trays	12
Meat tender	5
Ice trays	7
Hydrator glass	8
Furniture delivery	26
Furniture recall	30
Range parts	7
Refrigerator parts	10
Cooker pots	1
Space heaters	16
Door stops	2
Caulking compound	2
Grass seed	3

RECALL AND DELIVERY OF RANGES AND REFRIGERATORS -- MONTH OF SEPTEMBER

	DELIVERY		RECALLED	
	REFERS	RANGES	REFERS	RANGES
1Br.	1			
2Br.	4	1	11	6
3Br.	1	2		2
A	1	1	5	5
B	1	2	3	7
E				1
F				5
H				1
U			1	1
Y			2	
Z	1	1	1	1
Apt.			1	
<hr/>				
Total	9	7	24	29

IN WAREHOUSE

TA refers 7' .....21  
 GE refers 8' ..... 1  
 GM refers 7' ..... 2  
 Frig. 8082 ..... 2  
 SC ranges .....17  
 GE ranges .....13  
 GE refers 6' ..... 3

Property Transfer: 1 ea. GE leader ranges  
 #387793 to Gordon Neilson, Central Stores. 9-7-54  
 Excess: 3 ea. TA refers; 16 AB ranges; 1 ea.  
 GE 8' refers; 1 ea. GE leader range.  
 Salvage: 6 ea TA refers; 1 ea. GM refer; 1 ea  
 SO 82 refer; 2 ea. AB ranges

1215453

COMMERCIAL & RESIDENTIAL PROPERTY UNIT

RESIDENTIAL LEASES

SEPTEMBER 1954

DORMITORY REPORT

Dormitories:

	<u>Beds Available</u>	<u>Vacant Beds</u>	<u>Occupied Beds</u>
Men	477	40	437
Women	<u>381*</u>	<u>35**</u>	<u>343*</u>
Total	358*	70**	730*

\*This includes 2 beds used for Dorm Offices  
 \*\*This includes 7 vacant beds in Dorm H 13.

Waiting Lists

	<u>Single Rooms</u>	<u>Double Rooms</u>
Men	3	0
Women	6	0

The following Dormitories are in Stand-by condition:

W 21	50 Beds	W 15	50 Beds
W 17	50 Beds	H 7	39 Beds
W 16	50 Beds		

Total Beds: 239

RESIDENTIAL LEASING

CANCELLATIONS

Voluntary terminations	23
R. C. F.	0
Discharge	1
Transfers	1
Retirement	2
Move off Project	23
Divorce	2
Death	0
Move to Wherry House	0
Not eligible	11
Military Service	<u>1</u>
Total	74

ALLOCATIONS

Houses allocated to new tenants	67
Exchanged houses	22
Moves (Within Richland)	21
Turnovers (divorce, death, schools)	2
Wherry House move to G.E. House	<u>1</u>
Total Leases Signed	113
Total Cancellations	119
Houses Assigned "AS IS"	46
Houses sent to Renovation	34
Applications pending	24

1215054

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING September 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	2229	255	10	387	841	1129	10	54	61	205	38	5219
Comm. Fac.	89	17		29	58	51		4	4	7	2	261
AEC	67	29		20	58	15		4	3	11	3	210
Other Gov't	7	1			3	1						12
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	3	18			3	1				3		28
Chas. T. Main	3			2	5	6				2		18
Kaiser Eng.	6	7			7	1						21
J. A. Jones	2	2			2							6
Blaw-Knox	3	2		2	1							8
P. S. Lord					1							1
Steel Const. Co.	1											1
Minor Const.					1			1				2
Commonwealth Inc.						1						1
Not Certified	4	1			1	3		1			1	11
Turnover	1											1
<b>Total</b>	<b>2492</b>	<b>332</b>	<b>10</b>	<b>449</b>	<b>1000</b>	<b>1265</b>	<b>10</b>	<b>64</b>	<b>69</b>	<b>230</b>	<b>48</b>	<b>5969</b>
Assigned Leases												
Written						1						1
Assigned Leases												
Not Written	3	1				4		1				9
Available For												
Assignment	5			1		7						13
<b>Total</b>	<b>2500</b>	<b>333</b>	<b>10</b>	<b>450</b>	<b>1000</b>	<b>1277</b>	<b>10</b>	<b>64</b>	<b>70</b>	<b>230</b>	<b>48</b>	<b>5992</b>

	Begin Month	Moved In	Moved Out	End of Month	Diff
Conventional Type	2488	+32	-28	2492	+4
A&J Type	332			332	
"T" Type	10			10	
Precut Type	448	+4	-3	449	+1
Ranch Type	996	+10	-6	1000	+4
Prefab Type	1266	+36	-37	1265	-1
Dorm Apts.	10			10	
A&J Apts.	63	+3	-2	64	+1
2BR Apts.	70	+3	-4	69	-1
Fourth Housing	229	+6	-5	230	+1
Tracts	48			48	
<b>Total</b>	<b>5960</b>	<b>+94</b>	<b>-85</b>	<b>5969</b>	<b>+9</b>

1215455

COMMUNITY SECTION  
 RICHLAND FIRE DEPARTMENT  
 MONTHLY REPORT

September 1954

<u>Organization and Personnel</u>	<u>Exempt</u>	<u>Non-Exempt</u>
Employees beginning of Month	67	0
Transfers In	0	0
Transfers Out	1	0
Terminations	0	0
New Hires	1	0
End of Month	67	0

<u>Fire Protection</u>	<u>Richland</u>	<u>North Richland</u>
Fire Loss (Estimated) Government	\$ 35.00	\$ 0.00
Personal	0.00	0.00
September Total	\$ 35.00	\$ 0.00
Year's Total	\$10,384.23	\$4,085.00*

\*Does not include August 6, Drug Store fire in North Richland. Figures not available.

	<u>Richland</u>	<u>North Richland</u>
Response to fire alarms	22	15
Investigation of minor fires and incidents	1	0
Ambulance Responses	26	0
Inside Schools or Drills	20	4
Outside Drills	17	13
Safety Meetings	6	5
Security Meetings	3	1
Fire Alarm Boxes Tested	210	116

The Fire Department provided standby apparatus at the AEC Airport for plane landings and take-offs five times during September.

Ladder truck was utilized for removing guy wires on flagpole at Bomber Bowl.

Two Cub Scout groups, totalling 22 boys and 3 adults, were given conducted tours of the Central Fire Station.

Fire Prevention

A total of 42 buildings were inspected, resulting in 4 hazard reports being submitted. Twenty-eight fire extinguishers were inspected, two installed, two removed.

1215456

Fire Prevention - continued

Assisted AEC and Contracting officials in making a final acceptance inspection of the new Jefferson school fire alarm system.

Prepared information for a proposed regulation regarding carnivals and circuses.

At request of AEC Engineering, selected location for fire hose standpipes in the new Columbia High School addition

Fire Marshal arranged with the Richland Chamber of Commerce to sponsor Richland's Fire Prevention Week program. Conducted several meetings and outlined projects whereby every organization in Richland could take part in the program. Provided information and assisted with numerous news releases, radio spot announcements and interviews.

Promoted a television movie of major fire prevention activities and arranged with six civic and service clubs to underwrite the expense.

Fire Marshal promoted school fire prevention programs through school administration officials, principal's meetings, teacher's meetings and "Pep" talks throughout latter part of month.

Plant Safety Department requested Fire Marshal office to promote area fire prevention displays to be judged in competition with forward area displays by the Central Safety Council, which resulted in a minimum of five displays being planned in the 700/1100 Area.

Fire Prevention office ordered, or caused to be ordered, over 100,000 pieces of Fire Prevention Week promotional material. Acted as clearing house and distributed the material where it would get the best use.

1215857

COMMUNITY OPERATIONS SUB-SECTION  
 RICHLAND ELECTRICAL UNIT  
 MONTHLY REPORT  
 SEPTEMBER 1954

<u>ORGANIZATION AND PERSONNEL</u>	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	5	16
Transfers In	0	0
Transfers Out	0	0
Terminations	<u>0</u>	<u>0</u>
Total End of Month	5	16

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	<u>2</u>
Anchors set and guys installed	<u>0</u>
Street lights repaired and steel mast arms installed	<u>2</u>
Street lights relamped - Mercury Vapor	<u>4</u>
Street lights relamped - 6000L and 4000L, 1100 Area	<u>75</u>
Street lights relamped - 6000L and 4000L, 700 Area	<u>0</u>
Flood lights relamped, 1100 Area	<u>4</u>
Flood lights relamped, 700 Area	<u>2</u>
Stack lights relamped, 700 Area	<u>1</u>
Primary line footage added	<u>0</u>
Primary line footage removed	<u>0</u>
Transformer KVA added	<u>0</u>
Transformer KVA removed	<u>0</u>
Net transformer KVA installed	<u>0</u>
New services installed - residential	<u>0</u>
New services installed - commercial	<u>2</u>
Services removed - residential	<u>0</u>
Temporary services installed and removed	<u>0</u>
Scheduled outages - primary	<u>0</u>
Scheduled outages - secondary	<u>16</u>
Unscheduled outages - primary	<u>3</u>
Unscheduled outages - secondary	<u>0</u>
Standby and escort	<u>1</u>
High voltage tree trimming	<u>320</u>
Low voltage tree trimming	<u>20</u>

TRAFFIC SIGNALS

Relamping	<u>12</u>
Operational failures	<u>1</u>
Installations	<u>0</u>
Removals	<u>0</u>
Routine maintenance checks	<u>46</u>

1215458

**RICHLAND ELECTRICAL UNIT**

Routine check R.R. signal at Van Giesen	<u>4</u>
Total signals in operation - automatic	<u>19</u>
Total signals in operation - manual	<u>3</u>
Total signals in operation - flasher	<u>1</u>

**PUBLIC WORKS ELECTRICAL MAINTENANCE**

Electrical motors checked and serviced - irrigation	<u>32</u>
Electrical motors checked and serviced - water	<u>78</u>
Electrical motors checked and serviced - sewage	<u>62</u>

**FIRE DEPARTMENT TEST AND MAINTENANCE**

Inside circuit and equipment checks	<u>4</u>
Outside circuit checks	<u>4</u>
Inside faults repaired	<u>0</u>
Outside faults repaired	<u>3</u>
New circuits placed in operation	<u>0</u>
New boxes placed in operation	<u>0</u>

**SUBSTATIONS**

Main feeder and tie breaker checks - BB1S1	<u>6</u>
" " " " " " " - BB1S2	<u>6</u>
Secondary and pad located stations -	<u>24</u>
Checked jumpers, cutouts, grounds and general condition	

**METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE**

Radio interference checks	<u>1</u>
Voltage and load checks	<u>2</u>
Meters tested - customer's requests	<u>1</u>
New meters shop tested	<u>8</u>
Faulty meters replaced	<u>4</u>
Overloaded meters replaced	<u>2</u>
Damaged meters and covers	<u>1</u>
Residential read-ins	<u>197</u>
Residential read-outs	<u>191</u>
Residential disconnects	<u>19</u>
Residential reconnects	<u>19</u>
Meters resealed	<u>0</u>

**Consumption and Revenue (Accrual):**

	<u>No. of Meters</u>	<u>KWH</u>	<u>Revenue</u>
Residential - Schedule 1	6987	4,500,000	\$45,000.00
Commercial - Schedule 2	<u>374</u>	<u>3,200,000</u>	<u>28,000.00</u>
Total	7361	7,700,000	\$73,000.00

## RICHLAND ELECTRICAL UNIT

### COMMENTS

Rebuilding of a section of pole line south of Abbot and west of GW Way was scheduled on a planned outage, 8-26-54, and partially completed. Six rotted poles are being replaced and set back to the property line.

Primary jumpers were rearranged and B primary phase to AEC Airport was de-energized as it is not being used at Airport, thus removing unnecessary exposure. Planned outage was used from 1:00 p.m. to 2:00 p.m., 8-30-54.

Installed new mercury vapor light and pole on GW Way in front of Commercial Bus Depot, replacing two 6000 lumen lights and defective fixtures, and completing a mercury vapor lighting and respacing arrangement from Gillespie to Bypass Highway.

Installed new 25 kva transformer and service to serve new sandwich shop at 831 Stevens Drive. Placed in service 9-22-54.

Removed fused cutouts 11X154 serving commercial establishments on Stevens Drive between Knight and Lee as they were no longer needed. Line was cut straight through, 9-22-54.

Installed new service to supply Fleiss-Davis Warehouse #2 south of Lee in warehouse area.

Rerouted service to 1207 Williams to avoid tree problem at 1218 McPherson, account of service crossing another lot.

Metering of sanitary water system was installed as follows:

Duke well field, wells #2, 4, 5, 12, 13, 14, 15 and 18, two installations at 1182 area, and Well A at Columbia well field. Primary metering to be installed at North Richland well field and Columbia well field at a later date when the equipment now on order is received which will complete the metering project. Metering was installed at Richland Electrical Unit offices at 910 Spangler Road.

River pump installation next to Columbia well field was disconnected for the winter, at request of Mr. Petty. Replaced motor bearings at #1 irrigation well.

Planned outages were scheduled to accomplish the metering project on the wells. Preventive maintenance was scheduled and accomplished on well control equipment - high and low voltage switches and other equipment associated with the wells that are not ordinarily easy to service. Several defects and discrepancies were detected and repaired while wells were off the line.

Overhaul to circuit breakers, compartments and control equipment to our part of BBLS1 and EBLS2 was completed, including replacement of burned control wiring in Compartment #2. Repairs were made designed to prevent recurrence.

RICHLAND ELECTRICAL UNIT

System and equipment electrical repairs:

Repaired short circuited switch in electric range at Central Fire Station. Rearranged main panel wiring in Central Fire Station, removing fire alarm circuits from main switch supplying stoves, as stove trouble affects fire alarm supply circuit.

Trimmed trees from fire alarm circuits at Sibert and Haupt, Van Giesen and Stevens.

Cleared grounds on #7 fire alarm circuit.

Located grounds on #3 fire alarm circuit at Jason Lee School.

Sewage system and equipment electrical repairs:

Completed service checks and repairs to pump and digester motors.

Temporary disconnects to delinquent customers were made to 19 locations which were reconnected after notification from Accounts Receivable that accounts were paid. Most of the delinquents were out overnight. One customer desired service to be reconnected on callout time which extra expense was assumed by the customer.

Call-outs:

There were 36 paid weekly hours and 18 monthly hours of callout time paid during month on five occasions, as follows:

August 28 - Auto ran into pole on Hains Avenue

Restoration of residential service to 1419 Farrell Lane account of delinquent customer

Primary outage to Sanford south of Putnam account of wind blowing tree into line

Railroad signal failure at Van Giesen and Bypass

Outage to Central Fire Station fire alarm board

The utility part of the Electrical Unit operation is still involved in heavy tree trimming operation throughout the city, and it is expected to last about three months longer with four men trimming continually.

COMMUNITY OPERATIONS SUB-SECTION.  
ENGINEERING UNIT  
MONTHLY REPORT  
SEPTEMBER 1954

<u>PERSONNEL:</u>	<u>Exempt</u>	<u>Non-Exempt</u>	<u>Total</u>
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 SEPTEMBER:

1. Carnation Company - Alteration - 704 Harding
2. O. W. Couden - Electrical - Stevens Drive & Knight St.
3. Joe G. Wilson - Garage - 1531 Thayer
4. Harvey F. Stoller - Alteration - 294 Williams
5. 3 sign permits

EW MUNICIPAL CONSTRUCTION STARTED IN SEPTEMBER:

1. 6" Water Main - Stevens Drive - Kadlec Hospital to Central U. P. Church

NEW PRIVATE CONSTRUCTION STARTED IN SEPTEMBER:

1. Carnation Company - Alteration
2. Garage (Residential)
3. Gerde's Service Station - Building alteration for laundry drop and pick-up location.  
(294 Williams)

PRIVATE CONSTRUCTION COMPLETED IN SEPTEMBER:

- (New) Safeway Store
- Pleiss-Davis Store (Addition)
- SkyLine Theater (Screen Addition)
- Desert Inn Hotel Rest Rooms
- L. G. Cook Building
- L. G. Cook Building, Addition #1
- Seattle-First National Bank (Addition)

ENGINEERING JOBS COMPLETED IN SEPTEMBER:

- I-90724 - Extension Duane Avenue Shelterbelt
- T-90324 - Engineering, Inspection, Walks, Drives Columbia Playfield

ENGINEERING JOBS COMPLETED IN SEPTEMBER (Cont.)

- C-70578 - Review & approve "As Built" Plans on Richland Development Co. (Cannon Bldg.)
- C-70512 - "As Built" Plans Automatic Laundry Co. (Penney Bldg.)

STATUS OF ENGINEERING UNIT PROJECTS:

- CA-570 - Replace Raw Water Line #5 Well to Lee Boulevard. Advertised by AEC for bids. Bid opening to be October 21, 1954.
- CA-577 - Improvements to Existing Streets, George Washington Way - Construction 98% complete.
- L-004 - Guthrie Avenue Sidewalk, Gilmore to Goethals - Construction 15% 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 not started.
- 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 50% complete.
- IR-171 - Automatic Bar Screens Sewage Lift Station - To be readvertised in January 1955. No bids received at first advertising.
- IR-174 - Electricity Metering, Richland Domestic Water System - 60% complete. Waiting for additional material.
- IR-176 - Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park - Design complete. Being reviewed by A.E.C.
- IR-182 - 6" Water Main, Stevens Drive, Kadlec Hospital to Central U.P. Church - Contract awarded. Work in progress.

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 Built" General, Part II - Work progressing.
- I 90604 - Title III Inspection, Sanitary Sewer, Swift Blvd. & Gibble Street - Construction 99% complete. Recommendations on status of work have been sent to A.E.C.
- I 90624 - Storm Drains - George Washington Way - Construction 99% complete.
- I 90634 - Kadlec Hospital Grounds Improvements - Contract awarded. Work to begin by October 10.

STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS: (Cont.)

- I 90914 - Utility Lines, Legal Descriptions and Diagrams for Churches - 95% complete.
- I 90944 - Erosion and Dust Control 300 Area - Project being reviewed by A.E.C.
- 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-70588 - Legal Description on Southwest Corner Goethals & Williams - 10% complete.
- C-70589 - Legal Description on Southeast Corner Goethals & Williams - 10% complete.
- C-70590 - Legal Description Southeast Corner Knight & Stevens for Continental Oil Co. - 10% complete.
- C-70591 - Legal Description of Plot West of By's Burgers - Delayed for other work.
- C-70592 - Legal Description Southeast Corner Knight & Stevens for Frances S. Taylor - 10% 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) - 92% complete. No progress this month.

Assembly of God Church - 89% complete. Work progressing very 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 - 75% complete. Work progressing very slowly.

Plans, Specs., Inspections, Richland Heights Baptist Church - 92% complete. Construction progressing slowly. Building now occupied.

BUILDINGS UNDER CONSTRUCTION (Cont.)

Plans, Specs., Inspections, Richland Baptist Church, G.W.W. - 97% complete. Work progressing slowly. Now occupied.

Plans, Specs., Inspections, Christ of King Parish (Catholic) - Construction 50% complete. Work progressing rapidly.

Plans, Specs., Inspections, Central UP Church - Construction 15% complete. Progressing according to schedule.

Plans, Specs., Inspections, Walsh Tire Shop - 99% complete. Final inspection to be made. Now open for business.

Plans, Specs., Inspection, Parcell Service Station (Duane & Lee) - 20% complete. Work progressing according to schedule.

Plans, Specs., Inspection, Couden Drive-In (Stevens & Knight) - 95% complete. Work progressing rapidly.

Plans, Specs., Inspection Bus Depot Service Station - 50% complete. Work progressing according to schedule.

COMMUNITY OPERATIONS SUB-SECTION  
PUBLIC WORKS & RECREATION UNIT  
MONTHLY REPORT  
SEPTEMBER 1954

ORGANIZATION AND PERSONNEL

	<u>EXEMPT</u>	<u>NON-EXEMPT</u>
Employees Beginning of Month	* 6	54.5
Transfers Out	0	9.5
Transfers In	0	0
New Employees	0	0
Terminations	0	8.0
Total End of Month	* 6	37.0

\* Does not include one foreman on loan to Water & Sewerage Utilities Unit.

ROADS AND STREETS

All work has been completed on "Improvement of George Washington Way, Symons to Catskill" (CA-577), but final inspection and acceptance has not been made due to other incomplete work remaining in the contract.

Two catch basins with connecting pipe were installed at intersection of Barth and Falley to carry ponded surface water from east to west side where it will run off by gravity.

Correction of flow line grades and re-laying of surfacing was completed on gutters in the 700 block on Thayer; 500 block on Barth; 00 block on Lee; 100, 200, and 300 blocks on Falley.

Surfacing was replaced in service drives to parking lots at 215 Abert and 222 Armistead.

Thirty "Bus Stop" signs were re-located in conformance with a revised shuttle bus route to be placed in effect by Transportation Section.

The annual cleaning of catch basins and storm sewers has been completed.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks was continued.

PARKS AND PUBLIC GROUNDS

All work was completed on "Extension of Riverside Park South" (IR-175), and "Installation of Irrigation System, Jefferson Playground" (IR-167), and final inspection and acceptance was made on September 28, 1954.

Irrigation of lawn grass during graveyard shift was discontinued as of September 10, 1954 and necessary watering for remainder of season will be done on day shift. Grass mowing has been gradually curtailed and will be discontinued for the season in the immediate future.

## PUBLIC WORKS & RECREATION UNIT

The infield of the hardball diamond at Columbia Playfield has been devoid of turf for some time, and this area was shaped, fertilized and seeded to grass. A good cover of grass has come up and a hardy sod is anticipated by next hardball season.

Winterizing of shelter-belt irrigation systems was started on September 27, 1954 and is 75 percent complete.

Routine seasonal maintenance of park buildings, equipment and grounds; shelter-belt areas; and public grounds was continued.

### RECREATION

#### General

The regular monthly meeting of the Parks and Recreation Board was held at the Community House on September 2, 1954. A summary of participation in summer programs recently completed; a review of youth and adult recreation programs for the coming winter season; and a report on status of construction and maintenance projects on Parks and Recreation properties were presented to the board by representatives of this Unit.

A television showing of the World Series ball games was presented at the Community House by an agency of the Community Chest with cooperation of local merchants, and all proceeds collected on a donation basis were turned over to the Community Chest.

All planning and scheduling for the fall and winter activities program at the Community House have been completed. Instructors have been procured and appropriate publicity has been released through plant and local newspapers on this program which commences on October 4, 1954.

#### Attendance Statistics - September 1954

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Sub-Total</u>
<b>A. Community House</b>				
Games Room Activities	25	1348	239	1587
Hi-Spot Club	9	4045	32	4077
International Folk Dancers	4		61	61
Jr. Sportsmen Club	1	6	1	7
Richland Rod & Gun Club	1	3	150	153
Allied Arts	2		65	65
Jr. Stamp Club	1	4	1	5
Jr. Symphony	2	38	4	42
Volleyball League	1		22	22
Y Supper Club	2		94	94
Misc. Bookings	<u>52</u>	<u>150</u>	<u>1613</u>	<u>1763</u>
Total	100	5594	2282	7876

PUBLIC WORKS & RECREATION UNIT

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Sub-Total</u>
<b>B. <u>Parks &amp; Playgrounds</u></b>				
General Play - Riverside	30	3000	2000	5000
General Play - Columbia	30	900	1000	1900
Juvenile Fishing	20	50	10	60
School Athletics - Columbia	15	5625	10	5635
Non-Supervised Playgrounds (est.)	<u>30</u>	<u>2000</u>	<u>500</u>	<u>2500</u>
<b>Total</b>	<b>125</b>	<b>11575</b>	<b>3520</b>	<b>15095</b>
<b>C. <u>Summary</u></b>				
Community House, Parks, and Playgrounds				
Totals for September 1954		17169	5802	22971
Calendar Year to Date				321473

SANITATION

Labor Day was observed as a holiday and collections normally scheduled for this day were made on the following day. A total of 1077 tons of waste material was collected and disposed of during the month.

Effective September 15, 1954 this Unit was relieved of responsibility for collections from the 700 Area proper. The 700 Area has been equipped with enclosed bulk trash tanks, and the Transportation Section is providing the specialized equipment required to haul these containers. Disposal is being made at the Richland Disposal Grounds and a fee is assessed for this usage.

Trash trailers are being eliminated where can collection service is practical and to date eleven trailers have been removed from commercial and school locations.

COMMUNITY OPERATIONS SUB-SECTION  
 WATER AND SEWERAGE UTILITIES UNIT  
 MONTHLY REPORT  
 SEPTEMBER 1954

---

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	*6	22.5
Transfers Out	-	1
Transfers In	-	.5
New Employees	-	-
Terminations	-	1
Total End of Month	*6	21

\* Figure includes one shift supervisor on loan from Manufacturing and one shift supervisor on loan from Public Works Unit.

DOMESTIC WATER

Normal operations were continued throughout the month. Water consumption tapered off with the decreased need for lawn sprinkling.

A 1 1/2" water service line with meter was installed to serve Parcells Service Station and Garage at Lee Boulevard and Duane.

On September 20 a break in a 6" cast iron water main in the 1400 block on Stevens Drive was repaired. Cause of this break was not determined but a similar break occurred in this immediate area about four years ago and indications were that both breaks could be attributed to poor back-fill underneath the pipe when it was installed.

Two water main leaks were repaired in the ranch house area and one on Wellsian Way during the month.

A program painting of all frame well houses was commenced during the month.

Community Operations  
Water and Sewerage Utilities Unit

DOMESTIC WATER

	<u>Well Production Million Gallons</u>	<u>Average Daily Production</u>	<u>Total Consumption Million Gallons</u>	<u>Av. Da. Consump</u>
Richland	118,140.0	3.938	364,206.8	12.140
North Richland	305,237.0	10.174	67,019.6	2.233
Columbia Field 300 Area	71,963.8	2.398	64,019.4	2.133
<b>Total</b>	<b>495,340.8</b>	<b>16.511</b>	<b>495,245.8</b>	<b>16.507</b>

Maximum daily consumption was 24,760,800 gallons on September 10, 1954.

SEWERAGE SYSTEM

Digester mixers at the sewage treatment plant were returned to service and the digester operation is back to normal. Some difficulty was encountered with a bearing on the motor of one of the mixers and it was found necessary to renew the motor bearings.

The #1 heating boiler and boiler house unit heater was overhauled during the month.

SEWAGE

	<u>Total Flow Million Gallons</u>	<u>Average Daily Flow Million Gallons</u>
Plant No. 1	37.740	1.258
Plant No. 2	84.306	2.810
<b>Total</b>	<b>122.046</b>	<b>4.068</b>

IRRIGATION SYSTEM

A break occurred in the 30" wood stave irrigation water main near the coal yard and was repaired. Aquatic weed growth began retarding flow in the irrigation canal, but with supply needs dropping off it has not been necessary to apply any treatment for weed control.

COMMUNITY OPERATIONS SUB-SECTION  
 RICHLAND PUBLIC LIBRARY  
 MONTHLY REPORT  
 September 1954

**ORGANIZATION AND PERSONNEL**

	<u>Exempt</u>	<u>Non-Exempt</u>
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	18,880
Magazines	535
Pamphlets	83
Records	807
Inter-Library Loans	29
Grand Total	20,334

Current Book Stock

Books added this month	508
Books withdrawn this month	2
Grand Total	31,926

Phonograph Records added 0

Phonograph Records discarded 0

Registration

Adult	217
Juvenile	58
Total	275

Total Registered Borrowers 17,599

1215071

Children's Story Hour Attendance	221 (214 pre-school: 7 elementary school)
Meetings in North Hall	24

The Winner's Party for the children's summer reading club, "Build Your House in Bookland" was held on Saturday, September 11, in the North Hall of the Library. Of the 157 winners, 140 attended the party. Mr. Robert Jaske, Program Chairman, Richland Chapter of the Knights of Columbus, presented the awards and the certificates to the children.

ent

iv

1215472

- No. 1 - WD Norwood, M. D.  
2 - HM Parker  
3 - WA McAdams  
4 - DW Pearce  
5 - DW Pearce  
6 - HA Kornberg  
7 - HA Kornberg  
8 - JM Smith  
9 - TW Hauff  
10 - PC Jerman  
11 - AR Keene  
12 - 300 File  
13 - 700 File  
14 - Yellow File  
15 - Extra File  
16 - Extra File

To: File

This document consists of  
17 pages, No.      of  
16 copies, Series A

(This includes distribution page)

RADIOLOGICAL SCIENCES DEPARTMENT  
REPORT FOR MONTH OF SEPTEMBER 1954

By: H. M. Parker  
Date: October 4, 1954

This document contains restricted data as defined in the Atomic Energy Act of 1946, its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

General Electric Company  
Hanford Atomic Products Operation

1215473

**DECLASSIFIED**

DECLASSIFIED

HW-33200 DEL

RADIOLOGICAL SCIENCES DEPARTMENT

SEPTEMBER 1954

Summary

Twenty-one informal, 5 Class I and 2 Class II radiation incidents were recorded.

The general extent of contamination by ruthenium particles was essentially unchanged; one particle was located as far away as Pendleton, Oregon.

A preliminary review of the particle hazard was prepared, and research and development was strongly directed toward a prompt solution of the more pressing phases.

Radiological Engineering proposed changes that would lead to more economical use of evaporative capacity of Purex waste; in the adverse direction, percolation tests indicated the need for expansion of crib capacity for Purex process. Also restrictive were results of tests on proposals to use raw cooling water in a reactor.

1215474

RADIOLOGICAL SCIENCES DEPARTMENT

SEPTEMBER                      1954

Organization

The month-end force of 374 included 38 supervisors, 87 engineers and scientists, 21 clerical and 228 other personnel.

Number of Employees on Payroll

Beginning of month	372
End of month	374
Net increase	2

General

There were 21 informal, 5 Class I and 2 Class II radiation incidents. One of the Class II incidents concerned apparent substantial exposure of the hand, with the dosimetry somewhat questionable. The other case resulted from manipulations of ruthenium particles; classification as Class II does not appear to be mandatory, but is provisionally accepted, especially as the incident occurred in the department establishing the classification.

There was no significant intensification of the ruthenium particle problem. A review of the current degree of hazard was prepared, and the research and development studies were re-directed toward a solution of some of the questionable features revealed by the analysis. Ten units are actively participating in the ruthenium studies, and good progress is being made.

The department submitted its annual accounting of its stewardship of the Wahluke Slope.

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

TITLE

J. D. McCormack

A Single Tube Anticoincidence Background Shield - 9/10/54

C. M. Unruh

Radiation Instrument Calibration Source Holder

1215475

DECLASSIFIED

HW-33200

DEL

Radiological Sciences Department

RADIOLOGICAL ENGINEERING

Scope design progressed on the Redox stack sampler, which includes an isokinetic sampling line to the stack top and an elevator for special sampling at the stack top; Radiological Sciences assumed sponsorship of this project.

It was suggested that the excess evaporation capacity available in the Purex waste storage tanks could be used to evaporate other wastes not suitable for large scale ground disposal, by transfer to the Purex tanks as necessary to prevent evaporation to dryness.

A method of sampling overheads from boiling Purex waste while in the vapor phase before condensation was developed and is undergoing laboratory test.

Scavenging of current first cycle wastes with ground disposal of supernate and separate routing of coating wastes to tank storage appears to be feasible for B Plant reactivation and probably for T Plant.

Suggested tests of Purex crib sites indicated percolation rates of only 20 to 25 gallons per day per square foot, confirming suspicion of assumed high percolation rates previously used; the need for additional crib space is indicated.

Study of data from single reactor tube tests using raw water coolant showed significant increases of most radioisotopes in the effluent. It was recommended that pilot tests be on a smaller scale than the full or half-pile tests proposed.

A preliminary study was made of the radiation hazards and protection methods deemed necessary in performing metallurgical operations involving thorium.

RADIOLOGICAL RECORDS AND STANDARDS

Radiation Monitoring Unit

General Statistics

	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Special Work Permits	572*	495	4,871*
Routine and Special Surveys	1,622	1,470	14,139*
Air Samples	1,437	1,310	13,030
Skin Contamination	14	14	155

\*Correction of errors on August report

1215476

Radiological Sciences Department

Special studies to determine the validity of high finger ring results were conducted at the 108-B Radiometallurgy laboratory of the Pile Technology Sub-Section and indicated that one laboratory worker may have received hand exposure in excess of the permissible limit several times during the past four months. The man involved was engaged in polishing and mounting special samples of irradiated process tubing and was the subject of a whole body exposure of 10.5 r earlier this year. Preliminary investigation shows that the exposure to the hands may approach 100 roentgens for this four months period. If the hand exposure is substantiated, it will be reported as Class II incident No. 80. (1)

Following the physical separation of radioactive particles in a hooded glove box, a Laboratory Assistant of the Biophysics Section was found to have a particle on the right side of the neck. The estimated dose to a small skin area at this point was 75 rads. (Class II, No. 79). It is debatable whether this is properly described as a Class II incident; this classification does not establish a precedent. Numerous ground surveys throughout the reservation were required for Army and sub-contractor personnel and for Transportation, Security, Electrical, and Telephone field crews. A survey of the 108-B exclusion area indicated that the particle population had increased noticeably since the previous survey.

One of the ports in a cell at the Radiometallurgy building in the 300 Area was inadvertently left open while hot samples were being loaded into the cell. An Operator was exposed briefly in front of the open hole but recognized the error before overexposure occurred. The open port was not detected promptly because a radiation zone sign had been placed over the hole. (Class I, No. 384)

Special studies on mercerized cotton work gloves showed that the shrinkage was far less on this type of glove than those currently in use at HAPO. Purchase of the mercerized cotton gloves in the future will allow a savings of about \$6,000 per year. Other tests on protective clothing are under way.

A new type "fool proof" source holder for testing dose rate meters on all ranges in the field was designed and a prototype fabricated and evaluated. Field groups are now ordering units for their use.

---

(1) After preparation of this report additional film data were received and showed further uncertainties in the finger film results.

DECLASSIFIED

HW-33200 DEL

Radiological Sciences Department

Radiological Standards

Radiation Incidents

<u>Type</u>	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Informal	23	21	213
Class I	4	5	57
Class II	1	2	15

Two Class II and one Class I radiation incidents are summarized above. The other four Class I incidents included unplanned exposure of two employees while manipulating samples at the 105-H reactor building, of four men during routine cask car movement in the railroad cut at T-Plant, and of two Process Operators while laying paper on the canyon deck at T-Plant, and the contamination of four men from cooling water at the front face of the 105-H reactor

Exposure Records

a. Personnel Meters, and Records and Photometry

General Statistics

	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Gamma Pencils read	243,348	235,708	2,037,042
Potential overexposures	17	11	107
Confirmed overexposures	0	0	0
Slow neutron pencils read	1,668	1,612	11,268
Potential overexposures	0	1	2
Confirmed overexposures	0	0	0
Beta-Gamma film badges processed	39,629	41,034	338,996
Potential overexposures	25	22	479
Confirmed overexposures	1	0	1
Fast neutron badges processed	496	805	4,403
Potential overexposures	0	1	6
Confirmed overexposures	0	0	1
Lost readings (all causes)	143	70	1,755

Radiological Sciences Department

Bioassay

1. Plutonium Analyses

	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Samples assayed	538	736	6,675
Results above detection limit*	23	25	223
Resamples assayed	24	35	318
Results above detection limit*	8	19	99
Maximum d/m/sample	2.60	1.33	2.60

\*Detection limit was 0.05 d/m.

2. Fission Product Analyses

	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Samples assayed	681	928	7,428
Results above 10 c/m/sample	28	6	68

None of the results above 10 c/m indicated significant body deposition.

3. Uranium Analyses

Results of 312 samples processed this month are tabulated below. This brings the total number of samples processed this year to 2,552.

<u>Sample Description</u>	<u>Following Exposure</u>			<u>Following Period of No Exposure</u>		
	<u>Maximum</u>	<u>Average</u>	<u>Number</u>	<u>Maximum</u>	<u>Average</u>	<u>Number</u>
			<u>ug/liter</u>			<u>ug/liter</u>
Metal Preparation	64.2	3.2	80	11.9	1.8	42
Technical	23.4	12.6	7	---	---	--
UO <sub>3</sub> Plant	25.3	4.7	86	35.6	4.3	87
Special Incidents	4.7	2.4	4	---	---	--

Some of the samples at the UO<sub>3</sub> Plant were probably contaminated through faulty handling in the field.

4. Tritium Analyses

	<u>Activity Density (/mc/cc x 10<sup>3</sup>)</u>					
	<u>0-5</u>	<u>5-10</u>	<u>10-35</u>	<u>&gt;35</u>	<u>Total</u>	<u>1954 to Date</u>
Number of Samples	20	1	2	0	23	1,907

1215479

**DECLASSIFIED**

HW-33200 Date

Radiological Sciences Department

Bioassay (continued)

Thyroid Checks

All thyroid checks reported were below the warning level.

Band Score Summary

There were 68,836 alpha and 67,509 beta scores reported. About 0.003% of both the alpha and beta scores were above the warning level. Decontamination of all reported high cases was attempted and was successful.

Calibrations

	<u>Number of Routine Calibrations</u>		
	<u>August</u>	<u>September</u>	<u>1954 to Date</u>
Fixed Instruments	80	113	698
Portable Instruments	3,402	3,665	29,970
Personnel Meters	10,659	15,784	140,762
<b>Total</b>	<b>14,140</b>	<b>19,562</b>	<b>171,430</b>

BIOPHYSICS SECTION

Regional Radiation Measurements\*

Regional Monitoring\*

The general findings are summarized in the following table:

<u>Sample Type and Locations</u>	<u>Activity Type</u>	<u>Average Activity Density /uc/cc</u>	<u>Trend** Factor</u>
<u>Drinking Water and Related Materials</u>			
Benton City Water C5. Well	alpha	$9 \times 10^{-9}$	-
Richland, N. Richland, Benton City Wells	alpha	$(<5 \text{ to } 9) \times 10^{-9}$	-
100 Areas	beta	$(<0.5 \text{ to } 3.0) \times 10^{-7}$	-
Pasco, Kennewick, McNary Dam	beta	$(<0.05 \text{ to } 1.1) \times 10^{-6}$	-
Backwash Solids - Pasco Filter Plant	beta	$1.9 \times 10^{-2} / \text{uc/g}$	+2
Backwash Liquids - Pasco Filter Plant	beta	$4.1 \times 10^{-6}$	+20
Sand Filter Pasco Filter Plant	beta	$8.6 \times 10^{-5}$	+3
Anthracite Filter - Pasco Filter Plant	beta	$8.3 \times 10^{-5}$	+3

1215460

Radiological Sciences Department

Regional Monitoring (Continued)

Sample Type and Locations	Activity Type	Average Activity Density /μc/cc.	Trend** Factor
<u>Other Waters and Related Materials</u>			
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 to 7.2) x 10 <sup>-7</sup>	+4
Columbia River - Hanford Ferry	beta	9 x 10 <sup>-6</sup>	+2
Columbia River - below reactors	beta	6.2 x 10 <sup>-6</sup>	+2
Columbia River - Patterson to McNary	beta	(2.8 to 5.3) x 10 <sup>-7</sup>	+2
Columbia River - shore mud	beta	(0.2 to 1.7) x 10 <sup>-4</sup> μc/g	-
Raw Water - Operating Areas	beta	(<0.05 to 1.0) x 10 <sup>-6</sup>	-
Reactor Effluent Retention Basins to River	beta	13,000 to 19,000 μc/sec/reactor	-
Reactor Effluent Retention Basins to River	alpha	(3.4 to 4.7) x 10 <sup>-3</sup> <0.03 μc/sec/reactor	-
I <sup>131</sup> in farm wastes to river	I <sup>131</sup>	<5 x 10 <sup>-9</sup> 45 μc/day	-
I <sup>131</sup> in Columbia River - Hanford	I <sup>131</sup>	9.8 x 10 <sup>-7</sup> 1.6 x 10 <sup>-7</sup>	+3 -
<u>Atmospheric Pollution</u>			
Gross Alpha emitters	alpha	(<0.4 to 1.0) x 10 <sup>-14</sup>	-
Gross Dose Rate - Separations Areas	beta-gamma	1.2 to 3.5 mrad/day	-
Gross Dose Rate - Residential Areas	beta-gamma	0.3 to 0.7 mrad/day	-
Active Particles - Separations Areas	beta	(2.0 to 4.9) x 10 <sup>-13</sup>	-
I <sup>131</sup> Separations Areas	I <sup>131</sup>	(<0.4 to 4.8) x 10 <sup>-13</sup>	-
I <sup>131</sup> Separations Stacks	I <sup>131</sup>	<2.4 curies/day	-
Ruthenium - Separations Stacks	Ru <sup>103,106</sup>	<0.06 curie/day	-6
Rare Earths + Yttrium - Separations Stack	beta-gamma	No Samples	-
Active Particles - Wash., Idaho, Ore., Montana	-	0.01 to 0.16 pte/m <sup>3</sup>	-
Active Particles - HAPO	-	0.04 to 0.35 pte/m <sup>3</sup>	-
Tritium (as oxides) - Reactor Stacks	T	0.65 curie/day	-

1215481

**DECLASSIFIED**

HW-33200 DEL

Radiological Sciences Department

Regional Monitoring (Continued)

<u>Vegetation</u>	<u>Activity Type</u>	<u>Average Activity Density</u> <u>µc/cc</u>	<u>Trend**</u> <u>Factor</u>
Enviorns of Separations Areas	I <sup>131</sup>	5 x 10 <sup>-6</sup> µc/g	+2
Residential Areas	I <sup>131</sup>	<3 x 10 <sup>-6</sup> µc/g	-
Eastern Washington and Oregon	I <sup>131</sup>	<3 x 10 <sup>-6</sup> µc/g	-
Non-Volatile beta emitters, Washington and Oregon	beta	(3.5 to 4.3) x 10 <sup>-5</sup> µc/g	-
Alpha Emitters - Separations Areas	alpha	1.5 x 10 <sup>-7</sup> µc/g	-
Alpha Emitters - 300 Area	alpha	8 x 10 <sup>-8</sup> µc/g	-

\*More descriptive titles for these components of organization are now in use.

\*\*The trend factor shows the n-fold increase (+) or decrease (-) from last month, where values of n less than 2 will not be noted.

Regional Monitoring

Ground contamination by particles of radioactive ruthenium and rhodium was observed as far away as Pendleton, Oregon and Mesa, Washington during the month, with concentrations in the Richland-Benton City region averaging on the order of 1 particle per 3000 square feet. Surveys of food crops in the Ringold and Tri-City areas revealed no produce contamination. Iodine emission averaged 2 to 3 curies per day including periods of high emission at both T and S plants with maximum emission being 11 curies of I<sup>131</sup> from T-plant over a 27 hour period. General increases in airborne radioactive particle concentrations, presumably resulting from the Russian tests were noted at all Pacific Northwest stations on filters removed during the period from September 3 to September 8 with concentrations ranging from 30 to 200 particles per 1000 cubic meters and particle activity less than 20 d/m. Increases in activity were again noted on filter data collected between September 24 and September 27.

Radiological Measurement Evaluation

Statistical analyses were completed to show that current concentrations of gross beta particle emitters in Columbia River mud at downstream locations past the Yakima River mouth were significantly higher than at locations not affected by Hanford effluent. The average ratio of the activity of Ru<sup>103</sup> to that of Ru<sup>106</sup> in Redox effluent gas was found to be less than 1 since return to normal operations in July whereas calculated values of the theoretical

Radiological Sciences DepartmentRadiological Measurement Evaluation (Continued)

ratio in material processed during that time were on the order of 4:1. Comparison of the activity of gross beta particle emitters in reactor effluent entering the Columbia River during the second and third quarters of 1954 showed significant decreases at all reactors during the third quarter.

Radio-Analysis Laboratory

The following routine and special analyses were carried out during the third quarter of 1954 and the year to date.

<u>Type Sample</u>	<u>Analyses Completed</u>	
	<u>Third Quarter</u>	<u>Year to Date</u>
Vegetation	4000	11,810
Water	6239	18,678
Solids	839	2,299
Air Samples	1012	4,045
Uranium (Fluorophotometer)	1483	4,886
Oil Fog (Fluorophotometer)	949	1,831
Special Survey Samples (RMSS)	93	177
Special Survey Samples (RMU and RS)	239	480
Tritium Oxide	32	1,383
	<u>14,886</u>	<u>45,589</u>

A large scale program for separation of radioactive particles was begun to provide material for research studies on the ground contamination from the Redox process.

Synoptic Meteorology

<u>Type of Forecast</u>	<u>Number Made</u>	<u>Percent Reliability</u>
8 hour production	90	88.7
24 hour general	60	85.7
Special	92	92.4

The over-all monthly average temperature of 65.1° was 0.8° above normal precipitation, most of which occurred on September 16 and 17, totalled 0.51" which was 0.17" above normal. There were strong winds on September 11 and 27.

Experimental Meteorology

The computations of the annual probabilities that an effluent released under catastrophic conditions at HAPO would pass over any point within 200 miles of HAPO were completed.

DECLASSIFIED

HW-33200 DEL

Radiological Sciences Department

Experimental Meteorology (Continued)

Plans for a preliminary investigation of the meteorological factors involved in the process of particle pick-up from the earth's surface were considered during this period. Additional plans for studying the effectiveness of various methods of surface treatment as a means of halting or measurably reducing the translocation of particles after their initial deposition were also considered.

River Studies

Comments on the review copy "Columbia River Water Quality Studies" by the US Public Health Service, Cincinnati, Ohio were prepared and transmitted to the public.

Cross-sectional river samples were collected at Pasco-Kennewick and McNary Dam and concentrations of beta particle emitters determined. Some equipment, land-markers and other necessary facilities were made ready for Columbia River Survey work.

Earth Sciences

Laboratory experiments demonstrated the feasibility of using electrical resistivity measurements as a means of determining the dilution rate, thence the velocity of movement, of a spike solution in a well.

Laboratory studies on the effect of a wetting agent (Neutroxyx 600) and two decontaminating agents (Hilco "Triple Strength Cleaner" and "C.P. Cleaner") on the soil adsorption of Pu disclosed no obvious hazards to disposal to ground of Neutroxyx 600 in solutions at pH 9 and up to 0.5% concentration. An increase in the C. P. Cleaner concentration up to 0.1% at pH 9 decreased the Pu adsorption to zero. Hilco Cleaner reduced Pu adsorption to 55% at 0.5% concentration and pH 9. More concentrated solutions gelled in contact with the soil and would not pass through the column. Neither agent should thus be discharged to ground in Pu-bearing solutions nor in areas of Pu contamination.

Ultrafiltration of Pu solutions with Visking membranes indicated that, in inorganic waste solutions, Pu may exist either as a readily adsorbable ion or as a hydrolyzed species or "polymer", depending upon the conditions, that is sufficiently charged to be adsorbed by soil. If the Pu reacts with acetate or certain other anions, however, it forms a complex ion which apparently is not of colloidal dimensions but possesses characteristics inhibiting its adsorption by soil.

Radiological Sciences DepartmentIndustrial Hygiene

Radioactive particles from the ground surface were sized microscopically and dosage rates obtained by C.P. measurements; these particles are to be used in skin tests.

The study of protection from respirators against atmospheres containing ruthenium was continued. Tests were made on MSA All-Service and Assault Mask cartridges with Redox process atmospheres. Analysis of the MSA cartridge indicated penetration of less than 0.1%.

Preliminary laboratory analytical investigations were made to determine the "pick-up" of sodium from clean pyrex glassware during the analysis of respirator test samples containing NaCl. No significant effect was noted until dilute solutions were allowed to remain in such glassware for one week. Concentration of dilute solutions by evaporation produced an undesirable increase in sodium content.

Five additional sites of noise were investigated, four of which were found to be Class I conditions requiring the use of hearing protection.

Methods

Preliminary results indicate that a rapid method for determining the amounts of Ru<sup>103</sup> and Ru<sup>106</sup> in mixtures of these isotopes is possible by comparing  $\gamma$  ray spectrometer measurements of the 0.51 and 0.62 Mev peaks. If this method can be successfully developed it will be a means for rapid Ru<sup>103-106</sup> ratio determinations on the particles of current interest.

Thin crystals of anthracene have been grown from a saturated solution of anthracene in warm xylene. Sections of crystals 3-5 mg/cm<sup>2</sup> thick and 1-1/2 to 2" in diameter are being tested for  $\alpha$  counting efficiency in a search for crystals suitable for determining  $\alpha$  emitting isotopes by energy analysis.

Extensive tests on the carrier-free ruthenium distillation procedure show that a yield of 72% with a standard deviation of  $\pm 3.5\%$  is obtained. Use of carrier-free ruthenium simplifies the Ru<sup>103-106</sup> ratio determination.

The specific surface areas of UO<sub>3</sub> powders used in the dissolution rate studies have been determined by measurement of the air permeabilities of packed beds of the powder. The surface areas were 0.48 and 0.51 m<sup>2</sup>/g. Using these values, the initial dissolution rates are 12 and 11 g(U)·m<sup>-2</sup>·day<sup>-1</sup> respectively in distilled water at 37°C.

Absorption curves and backscatter factors have been completed on antimony-125.

DECLASSIFIED

HW-33200

DEL

Radiological Sciences Department

Physics

The positive ion Van de Graaff was modified so that the gas supply for the ion source is now outside the pressure tank. This will enable quite rapid change between proton and deuteron beams during the course of experiments.

In completing energy dependence measurements for thin anthracene scintillators, it was found that, at high dose rates of several r/hr, the photomultiplier tube response was non-linear and the tube gave too large a current.

305

The usefulness of the sigma pile, long counter, and water tank fast neutron source calibrations was extended down to sources as small as 10 mg Ra-Be.

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, the design of a precise thermoregulator for calorimetric measurements, and methods of boron determination by activation for application to meteorology oil fog detection.

Instrument Development

Equipment for monitoring fruit semi-automatically was assembled for Regional Monitoring to test various items for particle occlusion.

A glove box was equipped with detectors and instruments for use in rapid separation of radioactive particles from soil samples.

A preliminary study of the possibility of developing an instrument for detecting particles on people passing a test station was nearly completed. The analysis showed that a thin crystal beta scintillation counter was the instrument of choice.

Progress on the construction of the Ru-I monitor for Redox stack effluent permitted testing one set of four integrators. After minor circuit changes to eliminate noise pick-up, the unit performed as expected.

Radio telemetering development was concerned almost entirely with the recording part of the system.

BIOLOGY

Aquatic Biology

Absorption of Tritium by Aquatic Organisms

The following effective half-lives for turnover of body water in aquatic organisms were observed:

Juvenile Salmon	30 minutes
May fly nymphs	20 minutes
Snails	15 minutes

1215406

Radiological Sciences Department

Highlights of the Columbia River Survey

Activity densities of river organisms continued to increase, particularly in plankton and whitefish immediately below the reactors and in midge fly larvae living in the silt behind McNary Dam. One out of four whitefish sampled at Priest Rapids was significantly above background. Sportsmen are beginning to catch large numbers of whitefish immediately above Richland. Selected values of interest were:

<u>Organism</u>	<u>Location</u>	<u>Sample Type</u>	<u>Activity Density</u> ( $\mu\text{c/g}$ )	
			<u>August</u>	<u>September</u>
Mimnows (Shiners)	Hanford	Ave.	$4 \times 10^{-3}$	$3 \times 10^{-3}$
Whitefish flesh	Hanford & vicinity	Ave.	$3 \times 10^{-5}$	$3 \times 10^{-4}$
Whitefish flesh	Hanford & vicinity	Max.	$2 \times 10^{-4}$	$1.8 \times 10^{-3}$
Plankton	Hanford	Ave.	$5 \times 10^{-3}$	$1 \times 10^{-2}$
Midge larvae	McNary Reservoir	Ave.	$3 \times 10^{-4}$	$9 \times 10^{-4}$

Effluent Monitoring

Juvenile chinook salmon exposed to 5 per cent reactor effluent since last May finally showed significant mortality. The tolerance of these fingerling-sized fish to summer temperatures for such an extended period beyond their normal migrating time is of considerable interest.

Biology Control Unit

Biological Monitoring

Waterfowl contained slightly higher activity densities than those collected one year ago.

Fifty-six rabbit lung samples were surveyed by the channeled scintillation counter, with no measurable activity observed. Two others were shown to contain activity by autoradiography.

Clinical Laboratory, Radiochemistry, and Microscopy

Sixteen "natural" ruthenium particles were photomicrographed in preparation for skin tests. Other services followed the routine pattern.

DECLASSIFIED

HW-33200

DEL

Radiological Sciences Department

Experimental Animal Farm

Toxicology of I<sup>131</sup>

There was no significant change in thyroid metabolism in any group of sheep compared with results of one year ago.

Thyroids from newborn pigs in the 5 and 15  $\mu\text{c}$  I<sup>131</sup>/day groups showed no evidence of damage.

Whole Body Irradiation of Sheep

The dose distribution of X-rays in a dead sheep were determined, using a Victoreen r meter and employing different filters.

Metabolism

Fission Product Absorption and Metabolism

In progress are measurements of (1) uptake of ruthenium from the G. I. tract as a function of carrier concentration, (2) the effect of time after administration on the fate of intraperitoneally injected ruthenium, and (3) the transmission of acidic ruthenium salt solutions through the skin as a function of exposure time and acid concentration. Chronic experiments to establish equilibrium deposition in various tissues were continued.

Tritium Absorption and Metabolism

Protein and lipid fractionation of rats chronically fed tritium oxide, and studies of the distribution and retention of tritium in developing embryonated chicken eggs were continued.

Pharmacology and Experimental Therapeutics

Radiation scars are clearly provoked within the lung substance by "natural particles." One hundred days after intravenous administration the lung appears normal except for a few definite peripheral scars, and only these radiation scars contain small radioactive particles, as shown by autoradiography.

Plant Nutrition and Microbiology

Plant Nutrition

The protein content of the leafy portion of beans and the grain of barley is only slightly affected by the addition of up to 100  $\mu\text{g}$  of chromium per milliliter of solution or per gram of soil.

Radiological Sciences DepartmentPlant Nutrition (Continued)

Bean and barley plants grown in South Pacific soil contaminated with fallout have been harvested in preparation for analysis for isotope uptake.

R. B. E. by Microbiological Methods

EDTA effectively prevents loss of Po from a solution onto glass containers, but is not adequate in preventing the adsorption of Po onto yeast cells in suspension.

DECLASSIFIED



Due to the major increase in the level of activities in the pile areas, the SF Accountability Section found independent pile calculations and independent basin calculations to be necessary. This represents a six-fold increase in the number of accounts. Prior to July, 1954 this detail was unnecessary but with the July activities, followed by August and September performance, the expansion of control was demonstrated as a necessary change. The Hanford Operations Office and the Washington, D. C. Office of the AEC have approved.

Basic planning for establishment of a system of SF physical inventory inspection has been completed, using the Redox Process as a model. The procedure is capable of adaption to other processes and will provide a method for accelerated inspection activities in all processes. Test of the system at Redox provided verification of the inventory as performed by custodian.

Elimination of duplicate records between three custodians and SF Accountability was surveyed during September, with agreements reached on methods of procedure to become effective October 4. The three custodians affected are (a) Technical Section—Applied Research, (b) Manufacturing—Redox and (c) Metal Fabrication operations. Due to the service functions being assumed by SF Accountability, the transfer of records and reporting responsibilities will be a gradual transition based on performance.

The SF Accountability Section now has under discussion the potential relaxation of the shipping regulations which prohibit the shipments of normal uranium turnings with free metal content in excess of 2%. These regulations were directed towards the control of the fire hazard due to the known characteristics of the material. In the event of acceptance of alternate methods of control further liquidation of Technical inventory holdings to the extent of approximately \$75,000 can be achieved. In addition, the current procedure of inventory build-up to the economic point where oxide burning operations can be conducted will be eliminated. This will not only reduce inventory but will be a cost reduction factor.

Revision of cost codes to conform to revised functional organization charts was completed during September. These codes were established so that they could be used both for cost allocations and for salary administration and payroll records and controls. Assistance was rendered various departments in preparing revised employee listings and meetings were held with department representatives to explain changes incorporated in the code system and to clarify use of the new codes.

The semi-annual forecast of Manpower Requirements by Facility as required in Chapter 4285 of the AEC Manual was transmitted to HOO-AEC on September 16. The forecast included estimates of required personnel at various dates through June 30, 1958.

Two Top Secret Documents were issued during the month. Document XX 1286, titled "Product Unit Cost (Current Basis) Fourth Quarter Fiscal Year 1954," shows in detail the calculations made in combining production quantities, conversion factors, SF Material costs, conversion and depreciation costs to

determine plutonium unit<sup>M.</sup> costs for the period. Document XX 1285, titled "Product Unit Costs—Current Basis," contains unit cost of plutonium nitrate for second half FY 1947 through FY 1954 and lists the major events influencing costs and production, such as uranium price changes and startup dates.

During September, at the requests of the Manager-Manufacturing two information meetings were held with Manufacturing Department management by the Cost and Budgets Section, one in which a summarization was made of the present status of a fee-type contract and the second in which a complete review of budgeting procedures was presented.

The annual physical inventory of General Supplies, automotive parts included, in the custody of the Stores Unit, was taken as of September 22. Materials inventoried were warehoused in eight different areas.

The first phase of a depreciation study was concluded during the month. This proposed depreciation policy for 100 Areas was forwarded for review by department managers and representatives of AEC.

A joint inventory of the 115 KV Transmission Line was taken by the Plant Accounting Unit and Electrical Utility Section.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the AEC during the month amounted to \$668,000.

Appropriation requests processed during the month amounted to \$30,092.

"Let's Talk It Over" interviews were held with all employees in the Department during September. The annual ratings of non-exempt employees were also completed in conjunction with these interviews.

Detailed reports for the Financial Department appear on succeeding pages, as follows:

Summary of Cash Disbursements, Receipts and Advances	I - 4
Audits and Procedures Section Report	I - 5 through I - 7
Cost and Budgets Section Report	I - 8 through I - 11
General and Personnel Accounting Section Report	I - 12 through I - 17
Property Accounting Section Report	I - 18 through I - 23
SF Accountability Section Report	I - 24 through I - 25
Personnel and Organization Statistics	I - 26 through I - 27

SUMMARY OF CASH DISBURSEMENTS,  
RECEIPTS AND ADVANCES

A summary of cash disbursements and receipts (excluding advances of \$6,250,000 and \$6,425,000, respectively, by the Atomic Energy Commission) for the months of September and August, 1954, is shown below:

<u>Disbursements</u>	<u>September</u>	<u>August</u>
Payrolls (net)	\$3 357 737	\$2 822 596
Materials and Freight	1 532 538	1 470 351
Payroll Taxes	576 985	730 415
Payments to Subcontractors	523 965	426 870
Income From Special Insurance Collateral Funds	265 981	-0-
United States Savings Bonds	259 025	123 862
Group Insurance Premium	206 202	135 271
Pension Plan - Employees' Portion	105 878	117 872
Travel Advances to Employees	73 577	56 596
All Other	135 108	119 236
Total	<u>7 036 996</u>	<u>6 003 069</u>

<u>Receipts</u>		
Income From Special Insurance Collateral Funds	265 981	-0-
Rent	119 017	125 836
Electricity	57 648	52 656
Hospital	55 036	62 842
Telephone	44 832	49 036
Sundry Accounts Receivable	12 579	11 494
Refund of Travel Advances to Employees	10 734	14 078
Bus Fares	7 609	7 755
Sales to AEC Cost-type Contractors	6 615	6 257
Refunds from Vendors	1 140	4 819
Other	9 366	4 902
Total	<u>590 557</u>	<u>339 675</u>
Net Disbursements	<u>\$6 446 439</u>	<u>\$5 663 394</u>

Outstanding advances as of September 30 and August 31, 1954 were as follows:

	<u>September</u>	<u>August</u>
Cash in Bank - Contract Accounts	\$2 674 718	\$2 856 157
Cash in Bank - Salary Accounts	35 000	50 000
Total	<u>\$2 709 718</u>	<u>\$2 906 157</u>

AUDITS AND PROCEDURES SECTION  
MONTHLY REPORT—SEPTEMBER, 1954

An information meeting attended by all exempt employees of the Audits and Procedures Section was held on September 23, at which the section manager gave a report on the Company's program for "Development of Men," theme of the Association Island Conference this year.

Internal Audit

Reports were prepared and issued for the completed audits listed below:

Richland Community Council Fund (for Community Section)  
Proposed Transfer of 115 KV Transmission Line and Substations to  
Bonneville Power Administration  
Review of Inventory of Surplus Materials at Crane Company

Reports were in the process of being prepared for the following audits:

Material and Package Passes  
Control of Safety Awards and Employee Attendance and Service  
Recognition Pins  
Telephone Usage

Field work was continued on audits of:

Printing and Reproduction Services  
Mail Distribution  
Procurement and Maintenance of Office Equipment  
Fabrication Work in Progress

During the month, the following new audits were started and, except where noted, field work was continued on them through the end of the month:

Timekeeping and Personnel Check  
Richland Community Council Fund (report issued during the month)  
Analysis of Entries to Inventory Reserve Account

Follow-ups were made to determine extent of compliance with recommendations made as the result of the audits listed below:

Accounts Payable  
Accounts Receivable - Rent  
Accounts Receivable - Hospital

At the end of the month, follow-ups were also being made of recommendations made by the traveling auditors from Schenectady as a result of their recent audit of certain activities of the Hanford Atomic Products Operation. Our findings will be used in directing an answer to Schenectady regarding the status of the recommendations.

### Administrative Planning

During September, a total of 67 Organization and Policy Guides were processed and sent to Central Printing for production and distribution. This total included 4 nomenclature and appointments guides, 53 functions and responsibilities guides and 10 instructional guides.

Of the instructional guides, 2 were General Manager's issues:

- 05.1 - Plant and Equipment Appropriations
- 09.3 - Reports Pursuant to Federal Regulations of Lobbying Act

One guide, 18.14.3 ("Procurement of New Employees") consolidated the contents of three guides into this one issue. With the exception of 05.1.1 ("Plant and Equipment Appropriations Procedures"), and 08.6 ("Priority Message Procedure"), the balance of the guides related to personnel and payroll matters.

By the end of the month arrangements had been completed for maintaining the extra Organization and Policy Guide copy files within Administrative Planning; and for composing the reproduction copy of new OPG's on an IBM executive typewriter within Administrative Planning and then having the guides produced at Duplicating rather than at Central Printing. It is estimated that this change will result in a printing cost savings of approximately 70%.

One Office Letter was distributed, No. 201 - "Assignment of Numbers to Buildings and Facilities."

Sixteen AEC transmittals were received, two for action by the General Electric Company and 14 for information only.

### Accounting Procedures

One business graduate was added to the rotational training program during September and three were given permanent assignments, leaving five in training at the close of the month. The addition was a University of Utah graduate. The men who were permanently assigned went into the General Books, Plant Accounting, and Technical Cost Units.

An analysis of maintenance charges for payroll time recorders, begun in August, was completed this month and reviewed with Personnel Accounting supervision. It was recommended that new time clocks be purchased to reduce maintenance costs.

A revised procedure for distributing accounts payable vouchers and stores orders was submitted to the responsible section manager.

Descriptive literature on the various types of check signers available was secured and after a study of the advantages of each, submitted to responsible supervision with a recommendation.

Work is continuing on a review of Accounts Payable routines, special requests and back charges, and procedures for processing claims against carriers and vendors.

#### Reimbursement Accounting

A special assignment carried out in September was the preparation of a tabulation of personnel and costs for work which is under the line or functional direction of the Manager-Finance, requested by the General Accounting Services Department, Schenectady, in connection with a survey of such data throughout the Company. In submitting this material, the differences between the accounting organization and functions at HAPO and those of Company-owned plants were pointed out.

The completion of the revision of Financial Department authorizations was delayed pending the addition to the department of components which are to be transferred as of November 1 from the Plant Auxiliary Operations Department.

Annual ratings were completed and "Let's Talk It Over" sessions held with non-exempt employees in this group.

One non-exempt employee was loaned to the Inventory Accounting Unit for four days in September to assist in physical inventory work.

Ten letter approvals were received from the AEC during the month.

COST AND BUDGETS SECTION  
MONTHLY REPORT - SEPTEMBER, 1954

The consolidated report regarding status of funds in the construction budget item for Miscellaneous Projects Under \$100 000 for FY 1955 was prepared for the first time by the Consolidations and Budgets Unit. The report had previously been prepared by Plant Accounting Unit.

Again during September, employees were made available to both Inventory Accounting and to Internal Audit to assist these units during peak periods.

At the request of the A.E.C., a special product cost statement was prepared by Manufacturing Cost covering July, 1954 Fabrication process activity. Inventory and production was reported on a piece basis rather than on a per gram basis. The results of this method of product costing is apparently of value to the Commission and a similar statement will be prepared for the month of August at their request.

Consolidations and Budgets Unit

A tentative schedule of cost closing and reporting dates for the 2nd quarter of FY 1955 was completed and distributed to representatives of various Financial Department units and sections for review and comments.

The revised budgeting requirements for inventories were reviewed with the A.E.C. Budget Division and interested General Electric personnel. This was, primarily, in connection with the request by the AEC to provide inventory information by commodity listings.

Additional unit cost and related information was provided to Special Study personnel during the month.

Engineering Cost Unit

The practice of accruing 1 $\frac{1}{2}$ % of construction costs to provide a reserve for close out of the construction program was discontinued effective August 30, 1954. This reserve presently has a balance of \$1,295,000 which is considered adequate to maintain key personnel during a hiatus between programs should further construction develop or permit orderly disposition of personnel, material and equipment in the event no future construction is anticipated.

Agreements were reached with members of the A.E.C. Finance Division as to the financing of certain incremental overhead incurred by General Electric in connection with the construction program after completion of the present major expansion program. This overhead is presently financed by charging each construction project 2 $\frac{1}{2}$ % of total construction costs to create a fund and applying against the fund the costs as they occur. The fund is presently maintained by AEC and to date the 2 $\frac{1}{2}$ % has proven to be adequate to liquidate costs. Budgets for the overhead, consisting primarily of inspection, finance, purchasing, employee and community relations and workmen's compensation, when compared with the plant and equipment budget for corresponding periods indicate that no change in the 2 $\frac{1}{2}$ % factor will be required. Due to the uncertainty of plant and equipment projects, it is planned to reconfirm these calculations when the

Budget for FY 1957 and Revision of Budget for FY 1956 is prepared. Upon completion of the present expansion program, General Electric will maintain and be responsible for the adequacy of funds to cover these incremental overheads.

We have been advised by A.E.C. that the cost of certain work performed by the Technical Section and billed to A.E.C. as customer work in the past will, effective retroactive to July 1, 1954, be retained by General Electric and identified as Cost - Washington Designated Programs. This work formerly authorized by A.E.C. procurement directives will be authorized by the Financial Plan when revised in the near future. At the present, three programs are included for FY 1955:

- (a) Operation and Modification of the KAPL 120 In-Pile Loop (\$313,369)
- (b) Fabrication of MTR Fuel Element Testing Facility (\$14,925)
- (c) Single Channel Experiment and Related Work - Bluenose (\$46,790)

Authorized amounts are to be considered ceilings for FY 1955 and A.E.C. is to be notified in the event an overrun becomes apparent. Appropriate general ledger account and cost codes were established to record these expenditures. Billings accomplished for July and August were returned by A.E.C. and established in our accounts.

We were notified by HOO-AEC that budget item 2-23X-5013; Alterations and Additions to Hanford 100, 200 and 300 Areas, has been reduced from \$96,000,000 to \$14,000,000 by action of A.E.C., Washington, D.C. Additional justification to support the need for \$14,000,000 was requested and furnishing the information was accomplished through collaboration with the Design Section. Official Schedule 33 (HOO-AEC budget presentation to A.E.C., Washington) has been received showing the reduction to \$14,000,000.

Additional information was furnished to A.E.C., through the Engineering Department, with respect to excess machining costs resulting from cracked carbon received from Subcontracts G-5 and G-12 with National Carbon Company. These costs, which are to be used as the basis for negotiating an equitable adjustment of the subcontract price, are based on the average unit cost per detail fabricated and the excess cost established on the basis of number of details required due to utilizing short blocks as compared to the number of details originally designed in the reactors.

Organization and Policy Guide 05.3.1 permits delegation of authority by Department Managers to Section Managers for approval of work authorizations estimated to cost in excess of \$2,000 but not more than \$5,000. Approval to exempt the Manager - Projects from this limitation was received from the General Manager during the month. Manager - Projects is now delegated authority without limitation to approve work authorizations covering expenditures of plant and equipment funds duly authorized.

#### General Cost Unit

In conjunction with the scheduled discontinuance of the Plant Auxiliary Operations Department, arrangements were completed with respect to reassignment of

1215490

General Cost Unit personnel who have been assigned to PAO cost and budget work. This cost group will, however, remain intact through mid-November until October cost closing has been accomplished. Attention is being given to routines to effect the reallocation of personnel, budgets and other financial data and information in a most orderly manner.

Recognizing that rates included in leases with Community facility operators covering utilities (water, sewerage and refuse removal) were entirely out of line in many instances, our Community Cost Accountant has devoted a major portion of his time to this matter in recent weeks. Extensive studies and cost analyses have been made and revisions to more equitable amounts have been developed. Although amounts included in certain existing leases are low by as much as 150%, we are advised by Counsel that modifications cannot be made until leases are due for renegotiation, which may be several years hence. However, leases negotiated subsequent to September 1, 1954 do not include specified amounts to cover cost of these utilities, and separate billings at the revised rates will be made to lessees.

A number of other cost analyses and special assignments were undertaken by General Cost Unit personnel during the month, the most noteworthy being:

Procedure write-up of development of certain unit costs, and recalculation of certain unit costs of Radiological Sciences covering past two fiscal years.

Detailed analysis of certain categories of Radiological Sciences costs as requested by Manager - Biophysics Section.

Analysis of costs incurred by Personnel Accounting with emphasis on cost of manual versus machine methods.

Participation in staff meetings of two Radiological Sciences sections to the extent of explaining budget preparation, relationship of their portion to the over-all HAPO budget, source and appropriation of funds, etc.

#### Manufacturing Cost Unit

Early in the month, a general information meeting was held for Manufacturing Cost Personnel. On September 30, 1954, a combination safety and security meeting was held.

Agreement has been obtained from Computing to allow the impending work order code changes to be made on the IBM Master Cards by Cost Unit personnel. This will expedite the change-over and eliminate additional IBM runs.

Arrangements were made with Stores personnel to forward to Manufacturing Cost Unit, Declarations of Excess reports to determine proper cost codes prior to journalization. Prior to this arrangement, only a journal entry with very limited information was received.

Special Activities in the Metal Preparation Section included the preparation of a procedure on the use of revised Work Request Forms in conjunction with intra-

departmental maintenance performed on expense codes; a new type of maintenance report designed to provide valuable information for budgeting, cost analysis and reveal trends in types of maintenance work was prepared for the Power & Maintenance Sub-Section Superintendent; assisted Internal Audit in the review and audit of the Manufacture of Counting Tubes Inventory Account.

A detailed maintenance report for Separations and Reactor Sections was issued for the first time. This report provides a complete breakdown of costs charged to each expense order.

A study on a revision of the distribution of Redox Cost between plutonium and uranium was completed and the results were documented in HW-32748. The results show that until the Redox process is completely stabilized following the Phase II program, it will be necessary to make an analysis of each month's performance to obtain the proper percentage distribution of Redox Cost.

The first in a series of ten meetings was held by the Separations Section Manager with first line supervision in which the Manufacturing Cost Unit Representative was asked to participate and outline the major elements of cost and possible means of reducing costs within the section.

A graphic presentation of Reactor unit cost comparisons by areas from FY 1952 through FY 1956 was prepared for the use of the Reactor Section Manager in the Monthly Cost Meeting.

Work on the revised work authorization list was discontinued pending the organization changes brought about by the dissolution of Plant Auxiliary Operations Department.

GENERAL AND PERSONNEL ACCOUNTING SECTION  
MONTHLY REPORT - SEPTEMBER, 1954

NARRATIVE REPORT

General Books Unit

Arrangements were made to reduce the average balances in contract bank accounts from \$2,500,000 to \$2,000,000, and advances requested from HOO-AEC for the month of October reflected this reduction. Arrangements were also made to close out in October the contract bank account maintained in the Chemical Bank and Trust Company, New York City, and to reduce the salary bank accounts from \$50,000 to \$15,000. Reduction of \$15,000 in Salary Bank Account No. 1 was made in September and a reduction of \$20,000 in Salary Bank Account No. 2 will be made in October.

An analysis was prepared of travel and living expenses incurred by employees during FY 1953 and 1954 to attend meetings of technical and professional societies, in order to determine the feasibility of establishing a dollar budget by departments for such FY 1955 expenses.

Accounts Payable Unit

At the close of the month a review was made of all open purchase orders to determine outstanding commitments.

At the request of the Atomic Energy Commission, work was started on the accumulation of approximately 8500 freight and express bills paid for the account of AEC during the period January 1 through June 30, 1953 for forwarding to the General Accounting Office at Washington. These bills will be used by the General Accounting Office in auditing transportation rates; a request may be received to forward similar data on a current basis effective as of July 1, 1954.

Accounts Receivable Unit

Gross accounts receivable balances increased \$14,600 during the month. Details of the increases and decreases are summarized below:

<u>Increases:</u>	
Telephone	\$ 8 889
Rent	6 787
AEC Cost-type Contractors	4 951
Hospital	4 068
Total increase	<u>\$24 695</u>
 <u>Decreases:</u>	
Electricity	9 563
Others	532
Total decreases	<u>10 095</u>
Net increase	<u>\$14 600</u>

During the month, 468 delinquent notices applicable to electricity billings were mailed to Richland customers, and 203 final notices were mailed during the month applicable to 499 delinquent notices which were mailed in August. The electrical service of 19 customers was disconnected on September 23, 1954. All of these 19 customers made prompt payment, or made satisfactory arrangements for payment of delinquent bills, and service was restored on or before September 24.

Personnel Accounting Unit

Approximately 13,000 booklets were distributed with weekly salary checks on September 17 and September 24 in furtherance of Operation 4S. Distribution of literature to Good Neighbor Fund participants, solicitation of non-members, and distribution of ballots to participants for the election of directors were accomplished during September.

Continuous form checks and earnings statements for the nonexempt roll, printed on high speed 407 type IBM tabulator, were placed in use with the payroll paid on September 17.

The community firemen legal cases were closed with the payment of judgments in the Canfield and the Rivers cases in the net amount of \$117,023.95 to the Clerk of the United States District Court, Eastern District of Washington, at Yakima on October 1, 1954.

As a result of the new agreement with community firemen effective September 13, 1954, reduced monthly rates not subject to "adders" were placed in effect for two-platoon firemen.

Approval was received from AEC on September 20 to make payroll deductions for investment in shares of GESA Federal Credit Union and HAPO Federal Credit Union by employees. Arrangements are being made with the boards of directors of the two Credit Unions to establish agreements for accomplishing this.

Two annuity certificates were issued to former duPont employees during September, bringing the total of certificates issued to 101.

Employee communications meetings were held with all employees of the unit.

STATISTICS

General Books Unit

	<u>September</u>	<u>August</u>
<u>Advances from AEC</u>		
Balance at beginning of month	\$2 906 157	\$2 144 551
Advances received from AEC	6 250 000	6 425 000
Other cash receipts	590 557	339 675
	<u>9 746 714</u>	<u>8 909 226</u>
Less disbursements	7 036 996	6 003 069
Balance at end of month	<u>\$2 709 718</u>	<u>\$2 906 157</u>
Advances requested for subsequent month	<u>\$5 250 000</u>	<u>\$6 250 000</u>

	<u>September</u>	<u>August</u>
<u>Travel Advances to Employees</u>		
Balance at beginning of month	\$ 66 462	\$ 85 789
Advanced to employees	<u>71 279</u>	<u>\$ 57 422</u>
	<u>270 141</u>	<u>143 211</u>
Less:		
Travel, living and conference expenses reported by employees	61 210	62 671
Cash refunded by employees	<u>10 734</u>	<u>14 078</u>
	<u>71 944</u>	<u>76 749</u>
Balance at end of month	<u>\$ 68 797</u>	<u>\$ 66 462</u>

<u>Outstanding Travel Advances to Employees</u>		
Current	\$ 65 417	\$ 58 734
Outstanding over 30 days	<u>3 380</u>	<u>7 728</u>
Total	<u>\$ 68 797</u>	<u>\$ 66 462</u>

<u>Employees' Travel, Living and Conference Expenses</u>		
Reported by employees, etc:		
Travel and living expenses		
Off-site inspectors	\$ 23 137	\$ 19 501
Others	<u>37 529</u>	<u>41 467</u>
	60 666	60 968
Conference expenses	<u>544</u>	<u>1 703</u>
Total	<u>61 210</u>	<u>62 671</u>
Less:		
Expenses for trips which included attendance at Association Island conferences, temporarily transferred to Undistributed Costs	2 785	16 542
Expenses transferred to AEC	1 011	-0-
Expenses charged to other G.E. components or carriers	2 555	2 602
Living expenses in excess of \$9 per diem	512	(183)
Conference expenses	<u>544</u>	<u>1 703</u>
	<u>7 407</u>	<u>20 664</u>
Amounts determined to be payable by AEC	<u>\$ 53 803</u>	<u>\$ 42 007</u>
Number of expense reports submitted by employees	<u>264</u>	<u>276</u>

Accounts Payable Unit

	<u>September</u>	<u>August</u>
Accounts Payable:		
Balance at beginning of month	\$ 563 654	\$ 728 227
Vouchers entered	3 595 504	2 977 366
Accrual for inventories	28 507	35 528
Cash receipts	<u>1 140</u>	<u>4 819</u>
	<u>4 188 805</u>	<u>3 745 940</u>
Less:		
Vouchers paid	3 420 275	3 056 611
Reversal of accruals	<u>35 528</u>	<u>125 675</u>
	<u>3 455 803</u>	<u>3 182 286</u>
Balance at end of month	<u>\$ 733 002</u>	<u>\$ 563 654</u>

1215503

Other Statistics

	<u>September</u>	<u>August</u>
Number of vouchers recorded	4 230	4 207
Number of checks issued	2 579	2 850
Number of freight bills paid	1 632	1 481
Amount of freight bills paid	\$333 268	\$288 818
Number of purchase orders received	2 116	2 173
Amount of purchase orders received	\$1 416 613	\$1 431 887
Amount of cash discount earned	\$5 929	\$4 625

Accounts Receivable Unit

<u>Account</u>	<u>Balance</u> <u>8-31-54</u>	<u>Net</u> <u>Charges</u>	<u>Collections</u>	<u>Balance</u> <u>9-30-54</u>	<u>Number of</u> <u>bills issued</u> <u>during month</u>
Hospital:					
Active	\$ 93 955	\$ 61 999	\$ 59 644	\$ 96 310	1 374
Collection agencies (79 accounts)	9 569	1 841	128	11 282	
Telephone	38 876	54 957	46 068	47 765	6 816
Rent	39 715	395 265	388 478	46 502	6 907
Sundry:					
Active	28 778	12 678	12 931	28 525	346
Collection agencies (132 accounts)-a)	7 123	626	378	7 371	
Electricity	36 835	49 249	58 812	27 272	4 315
Equipment sales to facilities (1 account)	24 779		349	24 430	
Cost-type contractors	12 778	11 566	6 615	17 729	20
Safety shoes	1 348	2 447	2 588	1 207	237
Loans to employees (5 accounts)	770		37	733	
Sub-total	<u>294 526</u>	<u>\$590 628</u>	<u>\$576 028</u>	<u>309 126</u>	<u>20 015</u>
Reserve for bad debts	<u>31 393</u>			<u>32 070</u>	
Net	<u>\$263 133</u>			<u>\$277 056</u>	

(a- Includes all utility and rental accounts.

Personnel Accounting Unit

<u>Number of HAPO Employees</u>	<u>Total</u>	<u>Monthly</u> <u>Payroll</u>	<u>Weekly</u> <u>Payroll</u>
<u>Changes during month</u>			
Employees on payroll at beginning of month	8 771	2 286	6 485
Additions and transfers in	106	19	87
Removals and transfers out	(152)	(26)	(126)
Transfers from weekly to monthly payroll		13	( 13)
Transfers from monthly to weekly payroll		( 3)	3
Employees on payroll at end of month	<u>8 725</u>	<u>2 289</u>	<u>6 436</u>

<u>Overtime Payments During Month</u>	<u>September</u>		<u>August</u>	
	<u>Number</u>	<u>Amount</u>	<u>Number</u>	<u>Amount</u>
Weekly-paid employees	4 620	\$64 323-a)	4 956	\$77 474-a)
Monthly-paid employees	352	26 524	302	21 613
Total	<u>4 972</u>	<u>\$90 847</u>	<u>5 258</u>	<u>\$99 087</u>

<u>Number of Changes in Salary Rates and Job Classifications</u>	<u>September</u>	<u>August</u>
Temporary changes	132	201
Retroactive changes	11	11
Normal changes	992	1 002
Total	<u>1 135</u>	<u>1 214</u>

<u>Gross Payroll Paid During Month</u>	<u>September</u>	<u>August</u>
Engineering	\$ 792 484	\$ 790 905
Manufacturing	1 732 488	1 727 761
Plant Auxiliary Operations	807 457	808 086
Other	711 213	718 958
Total	<u>\$4 043 642-a)</u>	<u>\$4 045 710-a)</u>

(a- Payments to weekly paid employees are for four week periods.)

<u>Employee Benefit Plans</u> <u>Participation in Benefit Plans</u> <u>at Month End</u>	<u>Number</u> <u>Participating</u>		<u>Percent</u> <u>Participation</u>	
	<u>September</u>	<u>August</u>	<u>September</u>	<u>August</u>
	Pension Plan	7 956	7 979	97.9%
Insurance Plan				
Personal coverage	8 656	8 698	99.2	99.2
Dependent coverage	6 099	6 067	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 388	4 349	50.3	49.6
Savings Plan	1 142	1 133	13.1	12.9
Both plans	4 983	4 938	57.1	56.3

<u>Pension Plan</u>	<u>September</u>	<u>August</u>
Number retired	8	3
Number who became eligible for participation	48	64
Number who applied for participation	40	57
Number who elected not to participate	7	5

<u>Insurance Plan - Number of Claim Payments</u>	<u>September</u>	<u>August</u>
Employee life insurance	2	1
Employee accident and health insurance	451	496
Dependent accident & health insurance	449	430
Total	<u>902</u>	<u>927</u>

<u>Good Neighbor Fund</u>	<u>September</u>	<u>August</u>
Number participating	5 876	5 896
Percent of participation	67.3%	67.2%

<u>Suggestion Awards</u>	<u>September</u>	<u>August</u>
Number of awards	41	47
Total amount of awards	\$810	\$2 265
 <u>Preferential Rates</u>		
Number eliminated	18	-
Number currently in effect	560	578
 <u>Number of Military Allowance Payments</u>	8	9
 <u>Number of Payroll Deductions - Other than Taxes</u>		
Pension	24 500-a)	25 300-a)
Savings Bonds	15 177	15 359
Good Neighbor Fund	10 205	10 482
Insurance	8 657	8 769
House Rent	5 040	5 093
Union Dues	1 970	1 896
Safety shoes	641	955
Dormitory Rent	567	563
Hospital	442	491
Trailer Space	143	144
Barracks Rent	8	8
Other	185	185
Total	<u>67 535</u>	<u>69 245</u>

(a- Approximate

PROPERTY ACCOUNTING SECTION  
MONTHLY REPORT - SEPTEMBER 1954

Plant Accounting Unit

The General Telephone Company of the Northwest, Spokane, Washington, was visited by representatives from Property Accounting Section, Community Section and the Richland Telephone Section. The purpose of the trip was to determine the extent to which Federal and State regulations are followed in the accountability and control of communications systems, and to secure methods of operation, rates of depreciation, and commodity code classification lists. Copies of their operating procedures were obtained to be used as a guide in preparation of policy and procedures to be recommended at HAPO.

The same visit provided an opportunity to discuss municipal utility plant accounting with the City Auditor of Spokane. Uniform classification of accounts for municipal water utilities and electric power and light utilities were obtained from him.

The first phase of a depreciation study was concluded during the month. This proposed depreciation policy for 100 Areas was forwarded for review by departmental managers and representatives of AEC. Of significant importance were the revised estimates of service lives for pile areas and, if adopted, the amount of depreciation reserve to be adjusted and the treatment of replacement.

At the request of G.E. Audit, a joint inventory of the 115 KV Transmission Line was taken by Plant Accounting and Electrical Utility Section. A number of minor discrepancies have resulted in comparing this inventory to the original inventory, which was taken a year ago by the local AEC and Bonneville Power Administration.

Plant and Equipment values at September 30, 1954, are:

	(In Thousands)		
	<u>Asset</u>	<u>Reserve</u>	<u>Net</u>
Completed Plant and Equipment	\$737,300	\$287,115	\$450,185
Construction Work in Progress	35,468		35,468
Total Cost Recorded (GE Books)	<u>\$772,768</u>	<u>\$287,115</u>	<u>\$485,653</u>
AEC and Other Contractor Costs			
Land and Land Rights	\$ 5,476		\$ 5,476
Construction Work in Progress	<u>171,610</u>		<u>171,610</u>
Total - 1)	<u>\$949,854</u>	<u>\$287,115</u>	<u>\$662,739</u>
1) - Includes the following costs:			
Community Facilities	\$ 87,144	\$ 22,587	\$ 64,557
Medical Facilities	1,336	369	967
Total	<u>\$ 88,480</u>	<u>\$ 22,956</u>	<u>\$ 65,524</u>

The transfer of a non-exempt employee to exempt payroll increased exempt personnel to 7 and decreased non-exempt personnel to 30. A business graduate was transferred to Staff Department Costs and a rotational trainee was added to Plant Accounting as a replacement. Plant Accounting personnel at September 30 totaled 37.

#### Inventory Accounting Unit

The annual physical inventory of general supplies (automotive parts excluded) in the custody of the Stores Unit was taken as of September 22, 1954. Materials inventoried were warehoused in eight different areas. Results of the physical inventory are not yet available as work is still underway in reviewing custodial records and procedures and analyzing source documents and other data to determine final amounts and reasons for differences.

A pre-inventory meeting was held with Stores Unit personnel to discuss plans for taking a physical inventory of spare parts which is scheduled to begin on November 22, 1954.

In order to comply with the Commission's new definitions of standby and spare parts inventories a new General Ledger Account 0411 entitled Inventories - Standby was established. Recordings made in this account will represent the value of those items held for future operation of facilities placed in standby and those items stocked solely for use in the event of emergency.

Several meetings were held jointly by Stores Unit and AEC Financial and Property Management personnel to discuss the various registers and documents that will be utilized in connection with the auction sale of excess property. As a result of these meetings and since there will be a deviation from current document control methods, special controls and work routines were established in Inventory Accounting to provide for the accounting and booking of excess property sold in connection with the auction.

As a result of a recommendation made by Inventory Accounting in connection with the recent physical inventory of excess property, the responsibility for extending, controlling and booking of shipping documents affecting only excess property was transferred from the General Books Unit to Inventory Accounting Unit, effective September 1, 1954. This transfer of responsibility in no way affected the manpower requirements of either unit.

In order to comply with the Commission's revised reporting requirements, effective with the quarter ended September 30, 1954, with respect to excess property, a complete analysis was made of all excess property transactions for the months of July, August and September to provide the required reporting information. In addition, as a result of this analysis, our work routines with respect to accounting for excess property were modified to provide for accumulation of reporting data on a current basis.

A round table discussion with all Inventory Accounting personnel in attendance was held on September 30, 1954.

Following is a summary showing inventory account balances for the months of August and September 1954, together with the amount of change:

	(In Thousands)		
	Book Balance		Increase (Decrease)
	8-31-54	9-30-54	
Current Inventories			
General Supplies	\$ 1,406	\$ 1,446	\$ 40
Fuel and Lubricants	61	59	(2)
Essential Materials	3,318	3,317	(1)
Total Current Inventories	<u>4,785</u>	<u>4,822</u>	<u>37</u>
Special Materials	1,456	1,413	(43)
Spare Parts	2,649	2,692	43
Excess Materials	1,298	1,285	(13)
Total Inventories - Gross	<u>10,188</u>	<u>10,212</u>	<u>24</u>
Less: Spare Parts Inventory Reserve	(656)	(656)	0
Excess Inventory Reserve	(999)	(929)	(70)
Total Reserve	<u>(1,655)</u>	<u>(1,585)</u>	<u>(70)</u>
Total Inventories - Net	<u>\$ 8,533</u>	<u>\$ 8,627</u>	<u>\$ 94</u>
As a Memo:			
Excess Equipment	\$ 2,218	\$ 2,208	\$ (10)
Excess Equipment Reserve	(1,706)	(1,686)	(20)

#### Property Management Unit

One of the objectives of Property Management is to establish the plant property records on a businesslike basis so that management can determine the property for which it is accountable on both a plant-wide and unit basis and to supplement such records with standard practice policy guides and field evaluations which will insure not only the proper accountability but the economical use of Federal property in the custody of HAPO.

Due to the manner in which the Hanford Works came into existence and the condition of current records this is visualized as a long-range program of considerable magnitude consisting of a series of major steps. Step I of this program will be substantially completed with the delivery of property record cards to the Property Control Units during the coming month.

This first step has consisted of:

- (1) Promulgation of O&FG 04.6 (Capital Plant & Equipment - Accountability and Control).
- (2) Designation by managers of Property Control Units for their departments.
- (3) Establishment of more adequate and accurate methods for the unitization of new projects. This should be reflected in the establishment of the property records for the new K Area and Purex.

- (4) Inventory of uninstalled plant record property, establishment of tentative record cards, reconciliation of inventory with current records, establishment of permanent record cards, and furnishing property control units with duplicate record cards of the property for which they are accountable.

With the establishment of property records showing the actual number of units on hand in each activity and also on a plant-wide basis, information is available for the first time, to assist management in planning and controlling procurement, in preventing the accumulation of excess property, in reducing depreciation charges, in setting up a more orderly replacement program, in preparing budgets, and in locating spare equipment for units having need for same.

The next step in this program will be the preparation of a HAPO Standard Commodity Classification Catalogue; verification of current records and standardization of nomenclature; the application of IBM to the uninstalled equipment records; the inventory of installed equipment (as distinguished from uninstalled) and the establishment of complete and accurate plant records on a plant wide and Property Control Unit basis.

The final step visualized in the program is the complete mechanization of plant property records so as to provide fast, efficient and effective property accounting and property management data.

Arrangements are being made by AEC for the transfer of the Richland-Benton Switch 115-KV line and the Thayer, Stevens, North Richland Substations and a portion of the 300 Area Substation to the Bonneville Power Administration about October 15. The value of this line is about \$1,200,000.

Eighty-one requests for the disposal of property were investigated, processed and approved during the month.

#### Appropriations Unit

Project proposals and informal requests which were processed by Appropriations Unit and directives issued by the Commission during the month of September are shown in the following list:

#### CA-513 - Expansion of 200 Area Facilities

At the request of the Engineering Department, GE authorized funds - \$6,040,000 were reallocated as follows:

		<u>Reallocation</u>
Part A - Purex	\$4,097,500	\$4,015,500
Part B - Metal Conversion	342,500	342,500
Part C - Purex Prototype	560,000	560,000
Part D - Hot Semiworks	1,040,000	1,122,000

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 forwarded to the AEC September 20, 1954.

CG-562 - Waste Metal Recovery Plant Modifications

Project proposal requesting additional funds in the amount of \$165,000 (total funds requested \$385,000) to make equipment alterations necessary to allow operation of the two production lines in Building 221-U in series was approved by the AEC September 9, 1954.

CG-589 - Dejacketing and Ultrasonic Equipment Metal Examination Facility 105-C

Project proposal requesting \$152,000 to provide chemical dejacketing and ultrasonic grain size determination equipment in the Metal Examination Facility in the 105-C Building was forwarded to the AEC June 2. Directive dated July 9 authorized GE \$23,000 for design. Directive dated September 22 authorized project as requested.

CA-596 - Central Mask-Washing Station, Building 2723-W - Separations

Project proposal requesting \$22,000 (GE \$5,700) to design and install a central mask-washing facility to be located in the 2723-W Building was approved by the AEC September 15, 1954.

Hanford 4X Program

CG-597 - 200 and 300 Areas

Project proposal requesting a \$50,000 increase in funds (total funds requested \$500,000) for field work which must be performed to determine necessary procurement items of long-term delivery for the reactivation of "B" plant was forwarded to the Commission September 13. With GE concurrence, AEC issued directive dated September 20 authorizing \$461,000 for all 200 and 300 Area work, except the \$39,000 authorized for the "T" plant.

CG-598 - Purex Acid Fractionator

Project proposal requesting \$590,000 to provide facilities in and near the 202-A Building for the vacuum fractionation of nitric acid that will be recovered from the Purex operation was approved by the AEC September 15, 1954.

CG-600 - 100-C Alterations

Project proposal requesting \$725,000 for design procurement and field work to attain increased water flow for the 100-C reactor plant was approved by the AEC September 27, 1954.

CA-601 - General Ground Improvements - 300 Area

Project requesting \$200,000 (\$30,000 GE funds) for all required ground improvements for the 300 Area was forwarded to the AEC September 1, 1954.

CG-602 - Remote Sampling Equipment - Hot Semiworks

Project proposal requesting \$30,000 for the installation of a shielded remote sampling device in the Hot Semiworks 201-C Building was approved by the AEC September 15, 1954.

CG-604 - Removal of Catwalks from Discharge Area, 100-B, D, and F Areas

Project proposal requesting \$32,500 for removal of the concrete catwalks from the discharge areas of the 105-B, D and F Buildings was approved by the AEC September 15, 1954.

CG-605 - Installation of Additional Generating Capacity - 189-D, Test Laboratory

Project proposal requesting \$28,000 for the installation of a 375 KW motor generator set designed to operate in parallel with existing generators used for reactor heat transfer tests being conducted at the 189-D Building was approved by the AEC September 2, 1954.

SF ACCOUNTABILITY SECTION  
MONTHLY REPORT—SEPTEMBER, 1954

Normal uranium accounts in the Metal Preparation Section were appreciably improved by further corrections to the charges to the Process Solution account. Pending process changes continue to constitute the major problem and the opportunities to adapt the present system to these changes are becoming less feasible. Introduction of hollow or cored slugs constitute a factor beyond adaptation and revised procedures will become necessary. Currently, the controls represent the most efficient level achieved to date.

A survey of inactive materials was started in September covering Metal Preparation and 300 Area Technical activities. Completion date is scheduled for early October.

Due to the major increase in the level of activities in the Pile areas, independent Pile calculations and independent Basin calculations were found necessary. This represents a six-fold increase in the number of accounts. Prior to July, 1954 this detail was unnecessary but with the July activities followed by August and September performance, the expansion of control was demonstrated as a necessary change. The AEC - Hanford Operations Office and Washington D. C. have approved.

Continued work on the 234-5 Metal Fabrication, Plutonium Manual and SF Process Flow charts have now been completed. In addition Process Ratio Charts have been revised covering other operations as well as Metal Fabrication.

Basic planning for establishment of a system of SF physical inventory inspection has been completed using the Redox Process as a model. The procedure is capable of adaptation to other processes and will provide a method for accelerated inspection activities in all processes. Test of the system at Redox provided verification of the inventory as performed by custodian.

Measurement methods activities directed to the coulometric determination of F-10-P solutions continue to show good agreement with the X-ray photometer results in the 231 Bldg. September performance has provided further substantiation to the feasibility record of this measurement procedure.

Final commitment on the use of the Gumprecht Curve has been received from the Technical Section. Preparation for its use are now in progress. The change involves the use of an exponential curve in place of the current quadratic equation.

Elimination of duplication records between three custodians and SF Accountability was surveyed during September with agreements reached on methods of procedure to become effective October 4, 1954. The three custodians affected are (a) Technical Section—Applied Research, (b) Manufacturing—Redox and (c) Metal Fabrication operations. Due to the service functions being assumed by SF Accountability, the transfer of records and reporting responsibilities will be a gradual transition based on performance.

Recovery of  $UO_3$  inactive status material was completed during September 1954 with material now being processed on a current basis. This completed the liquidation by recovery of a back log which represented a maximum of \$155,000.00 equivalent value.

Potential relaxation of the shipping regulations which prohibit the shipments of normal uranium turnings with free metal content in excess of 2% are now under discussion. These regulations were directed towards the control of the fire hazard due to the known characteristics of the material. In the event of acceptance of alternate methods of control further liquidation of Technical inventory holdings to the extent of approximately \$75,000.00 can be achieved. In addition, the current procedure of inventory build up to the economic point where oxide burning operations can be conducted will be eliminated. This will not only reduce inventory but will be a cost reduction factor.

Reorganization of the GE-HAPO, SF Accountability Section was completed during September with early application of the changes scheduled for early October, 1954.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION

SEPTEMBER 1954

	<u>Current Month</u>	<u>Prior Month</u>
<u>Personnel Changes During Month</u>		
Employees at beginning of month	386	379
Additions and transfers in	5	14
Removals and transfers out	5	(7)
Employees at end of month	<u>386</u>	<u>386</u>
 <u>Personnel by Unit at Month-End</u>		
<u>General</u>	<u>7</u>	<u>7</u>
 <u>Audits and Procedures Section</u>		
Accounting Procedures	2	2
Administrative Planning	2	2
Internal Audit Unit	17	13
Reimbursement Accounting	5	5
	<u>26</u>	<u>22</u>
 <u>Cost and Budgets Section</u>		
Consolidations and Budgets Unit	8	8
Engineering Cost Unit		
General	5	5
Design Section Costs	7	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	17
Radiological Sciences and others	8	8
Manufacturing Cost Unit		
General	2	3
Analysts	3	9
Budgets and Control	15	16
Records and Reports	14	15
Financial Representatives	7	0
	<u>124</u>	<u>127</u>
 <u>General and Personnel Accounting Section</u>		
Accounts Payable Unit	31	31
Accounts Receivable Unit	22	22
General Books Unit	19	19
Personnel Accounting Unit		
General	2	2
Monthly Payroll	11	11
Benefit Plans Accounting	12	12
Personnel Records, Non-Exempt	8	9
Payroll Reports	7	7
Weekly Payroll	20	19
Payroll Planning & Analysis	7	6
	<u>139</u>	<u>138</u>

	<u>Current Month</u>	<u>Prior Month</u>
<u>Property Accounting Section</u>		
General	2	2
Appropriations Unit	4	5
Inventory Accounting Unit	12	12
Plant Accounting Unit	37	36
Property Management Unit	<u>3</u>	<u>3</u>
	<u>58</u>	<u>58</u>
<u>SF Accountability Section</u>		
Measurement Methods Unit	5	5
Process Flow Unit	3	4
SF Accounting Unit	4	3
SF Records and Reports Unit	<u>15</u>	<u>15</u>
	<u>27</u>	<u>27</u>
Rotational Trainees	<u>5</u>	<u>7</u>
	<u>386</u>	<u>386</u>

PLANT PROTECTION SECTION

MONTHLY REPORT - SEPTEMBER 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	<u>Beginning of Month</u>	<u>End of Month</u>	<u>Increase</u>	<u>Decrease</u>
Staff	2	2		
Administration Area Maintenance	101	98		3 (a)
Security and Patrol	492	488		4 (b)
Fire Protection	136	136 (c)		
Office	202	194		8 (d)
	—	—		—
TOTALS	933	918		15

NET DECREASE: 15

(a) - Administration Area Maintenance

2 - Transferred in  
4 - Transferred out  
1 - Termination

(b) - Security and Patrol

2 - New Hires  
1 - Transferred in  
1 - Deactivated  
5 - Transferred out  
1 - Termination

(c) - Fire Protection

1 - Transferred in  
1 - Transferred out

(d) - Office

6 - New Hires  
1 - Reactivated  
1 - Transferred in  
2 - Deactivated  
12 - Transferred out  
2 - Terminations

FIRE PROTECTION

Fire Responses

Construction	4	Loss	----
HAPO	8	Loss	\$208.00
Army	1	Loss	----
	<hr/>		<hr/>
Total	13		\$208.00

Drills Held during September

Outside drills	112
Inside drills	126
	<hr/>
TOTAL	238

A class was held on artificial respiration which was attended by nine operations employees.

Twelve Round Table discussions were held in the Fire Protection Unit with eight members attending each discussion; exempt and non-exempt employees.

Seven Information Meetings were held with six members, exempt and non-exempt, attending each meeting.

Fire Extinguishers

Inspected	1,916
Installed or relocated	6
Tested	608
Delivered to new locations	5
Seals broken and not reported	24
Serviced	353
Weighed	402

Gas Masks

Inspected	33
Serviced	10

OFFICE SUB-SECTION

Plant Mail and Addressograph

Internal mail and postal (all types) continued to increase, and total postage used increased noticeably.

Special assignments included preparation of two separate mailings of material concerning "Mr. Atomsaver", several mailings of packaged Organization and Policy Guides, and three preparations and releases for "Good Neighbor Fund" to all employees.

Revision of mail stops and mail boards along with a change of procedure in relaying information to the outer mail rooms for changes, additions and deletions was completed during the past period. A major change in the mail system was accomplished by moving 100-F Area mail room equipment and personnel to 100-D Area, thus eliminating expense of maintaining the additional room.

Addressograph work remained normal. A slight decrease in volume was off-set by the amount of hand work necessary since booklets, envelopes, store orders and the bulk of the work this past month could not be run through automatic feed machines.

<u>Types and Pieces of Mail Handled</u>	<u>August</u>	<u>September</u>
Internal	3,689,681	4,446,532
Postal	74,654	80,390
Special	1,906	2,022
Registered	1,625	14,326
	<hr/>	<hr/>
	3,767,866	4,543,270
Total postage used	\$1,849.31	\$2,018.29
Total teletypes handled	2,646	2,798
Total store orders handled	825	821

<u>Addressograph</u>	<u>August</u>		<u>September</u>	
	<u>Number of runs</u>	<u>Total Copies</u>	<u>Number of runs</u>	<u>Total Copies</u>
<u>Type of List</u>				
Plant name list	116	168,382	112	138,531
Housing list	29	62,518	28	68,320
Payroll list	22	36,184	13	23,633
Total new plates	1,865		4,365	
Total corrected plates	5,145		2,463	
	<hr/>		<hr/>	
	7,010		6,828	

### Printing

One additional Century Text Type face, electric typewriter was made available to Printing, making it possible for two typists to prepare photographic copy simultaneously, on such requests as Organization and Policy Guides, Safety Topic of the Month, Accident Prevention Bulletins and Monthly Health Bulletins. This addition to the Print Shop will provide faster service.

Among the many priority orders handled this month were: 10,000 Safety Award IBM cards; 50 place cards for General Manager; 3000 - 17" x 22", both sides, AEC Public Auction Brochures; 20 each of 17 originals AEC Managers Data Report; 40 each of 19 originals Financial Statement; 50 place cards for Engineering Department; 100 copies new issue of booklet "Here's Hanford"; 1,000 Personnel Specifications; 1,000 Personnel Inventory forms; 1,100 copies, Plant Organization Directory; 9,000 two-color Employee News Letter; and 7,000 Election Committee, Nucleonics Employees Good Neighbor Fund envelopes.

Printing (Contin.)

<u>Work Completed</u>	<u>August</u>	<u>September</u>
Orders received	402	413
Orders completed	399	392
Orders on hand	117.1	129.3
Copies printed	1,107,559	1,525,442
Negatives masked	839	928
Negatives processed	850	956
Photo copy prepared	338	289
Litho plates processed	984	1,137
Production hours		2,870

Stenographic Services

Employment of new stenographers has slowed considerably and only four new employees were assigned to the Stenographic Pool in September. Seven transfers were effected and there was one termination. Twenty-nine temporary assignments were made throughout the month.

<u>Breakdown of Hours</u>	<u>August</u>	<u>September</u>
Meeting time	4.5	16.5
Vacation time	120	0
Machine Transcription	0	23.5
Letters	108	21.5
Rough Drafts	84.5	138.5
Dittos, duplimats and xerography	349	305.5
Miscellaneous	577	464
Holiday Time	0	96
Training Time	302	449
Unassigned time	60	67
	<hr/>	<hr/>
Total	1,605	1,581.5
Employees on loan to other units	2,303	2,093
	<hr/>	<hr/>
Grand Total	3,908	3,674.5

Plant Duplicating

On September 28, 1954, a new model 1,250 offset press was installed in the 3760 Building Duplicating office. This equipment will be used to duplicate Library Abstract cards formerly reproduced by the mimeograph method. The new procedure will eliminate the necessity for slip-sheeting and drying time. Service on this work will therefore be greatly accelerated, and quality improved. The change will also make it possible to excess one mimeograph machine.

Tests were made this month to determine the feasibility of duplicating Organization and Policy Guides from paper masters in Central Duplicating, 703 Building. The results of the tests indicated that Xerographic masters will reproduce satisfactory copies of OPG's and that considerable time and expense may be saved by utilizing this procedure.

Plant Duplicating (Contin)

A study is presently being made of a proposal to move the Plant Duplicating office located in 3760 Building in 300 Area. The 300 Area landlord was contacted regarding the availability of space in 3702, and the estimated costs of such a move are being prepared.

<u>Plant Duplicating Statistics</u>	<u>August</u>	<u>September</u>
Orders received	2,865	3,229
Orders completed	2,894	3,135
Orders on hand	72	111
Offset plates	14,676	13,577
Offset copies	814,882	781,659
Verifax masters	1,220	2,134
Verifax copies	3,764	7,300
Stencils	44	661
Stencil copies	565	9,002
Ditto masters	249	403
Ditto copies	4,506	8,367
Xerox plates	1,358	1,297
Ozalid masters	0	9
Ozalid copies	0	84
Total copies duplicated	825,075	806,412

Records Control Unit

Quantity of records received, processed and stored:

Employee and Public Relations Department	49	Standard Storage Cartons
Engineering Department	36	" " "
Financial Department	108	" " "
Manufacturing Department	53	" " "
Plant Auxiliary Operations Department	34	" " "
Radiological Sciences Department	5	" " "
Total	285	Standard Storage Cartons
Persons provided records service:	654	
Cartons of records destroyed:	310	
Records cartons issued:	312	

Percentage of Records Service Center Vault (exclusive of North Richland) occupied by records is 87.75%.

Thirty-three requests for file cabinets were received. Seventeen requests were filled, twelve requests were cancelled, eight requests are pending. Three fireproof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a saving of \$450.00 (\$225.00 cost of combination locked cabinet minus \$75.00 cost of key locked cabinet equals \$150.00 savings per cabinet exchanged). Thirteen key locked cabinets were picked up with no exchange and returned to stock for reissue.

Category evaluation of Synoptic Meteorology records consisting of 24 individual records was developed and ready for submission to Radiological Sciences Department for approval.

Records Control (Contin)

Uniform filing was established in eight offices during the month. A total of 496 offices have installed the system to date. Four rechecks were made on established offices.

Office Equipment Unit

A study was made to determine the valuation of office machines and equipment available from construction contractors surplus to upgrade operations equipment. The value of material available for this program is approximately \$115,000. An Appropriation Request will be issued to cover those items required. The old equipment will be disposed of through standard procedures.

Office Furniture

A field survey was made through Kaiser Engineers office to appraise the condition of furniture that will be available. The executive type desks are in fair condition, the secretarial type desks will be coded as poor condition and not economical for rehabilitation for reissue to operations offices. Approximately 200 metal file cabinets are in good general condition. These items will be checked as they become surplus to Kaiser Engineers and those items classed as serviceable will be transferred to operations for upgrading and replacing existing equipment.

An annual inventory of office furniture in stores stock was made by Stores during the month.

The activity in issues and pick ups was below average during the month. No salvage material was delivered to excess yard due to Stores personnel preparing for annual Inventory and Auction sale.

A detail of pieces of furniture handled during the month is as follows:

<u>Item</u>	<u>Received</u>	<u>Issued</u>
Bookcase	3	1
Blackboard	0	5
Chairs	115	176
Costumers	5	13
Card File	9	8
Cabinets	83	66
Desks	47	69
Tables	26	28
Davenc	1	2
Miscellaneous	69	147
	—	—
	358	521

A part of the furniture for 313 Building, 300 Area, was delivered during the month with remaining requirement scheduled over the next 120 days.

### Office Machines

An inventory balance of 5,143 machines is carried in service and stock on the 20th of the month. This is a net reduction of two machines.

One 1250 Multilith was received and installed in Central Duplicating to replace an old mimeograph machine.

### Office Machine Repair Unit

During the month of September all the rental Xerox machines on the project were checked by a representative of the Haloid Company.

One new 1250 Multilith was installed in the 3760 Duplicating shop, this machine was completely checked for proper operation by a representative of the Addressograph-Multigraph Company, Spokane, Washington, Sales Agency.

Work load study was made in the 300 and 100 Areas to determine the need for a machine repair shop in these locations. The 300 Area shop would replace the 3000 Area shop presently being used. The 3000 Area shop will not be available after May 1955 due to landlord change.

A request has been submitted to 100-H Area for suitable space in that area for a repair shop. This shop will be used as a location to perform minor overhauls, routine inspections and normal service calls to all of the 100 Areas. The shop is to be manned by two journeymen.

A utilization study was made on all attendance time recorders with idea in mind to upgrade necessary equipment by purchase of new clocks. The study was also made to make a complete report to the Finance Section regarding the type and amount of maintenance performed on these clocks. A report of this study was submitted to the Finance Department. The report also included recommended future maintenance procedure and cost to perform this maintenance. Indicated annual savings will amount to \$3,360.

Repair tickets were processed as follows:	<u>August</u>	<u>September</u>
	593	683

### Laundries Unit

<u>200-West Laundry</u>	<u>August</u>	<u>September</u>
Pounds Delivered	257,400	223,111
Pounds Rewashed	19,739	18,906
	<hr/>	<hr/>
Total Dry Weight	277,139	242,017
<u>Monitoring Section</u>		
Poppy Check - Pieces	232,655	225,736
Scaler Check - Pieces	339,766	304,062
	<hr/>	<hr/>
Total Pieces	572,421	529,798

<u>700 Area Laundry</u>	<u>August</u>	<u>September</u>
Flatwork - Pounds	37,932	28,994
Rough Dry - Pounds	19,828	17,216
Finished - Pounds	2,209	1,973
	<hr/>	<hr/>
Total Weight	59,969	48,183
Estimated Pieces	78,559	63,119

ADMINISTRATION AREA MAINTENANCE SUB-SECTION

AEC-114 New Transportation Facilities: Contractor's estimated completion percentage is 99.7. Contractor's estimated revised completion date is October 15, which appears somewhat doubtful.

Mail Shop Building: Complete except for minor electrical, plumbing and sheetmetal work. Some small runs of heating supply duct have yet to be insulated and should be completed this week. Isolated touch-up painting remains to be done. Existing equipment from 1131 Machine shop has been moved out and has been installed and painted a green field coat.

Dispatcher Building: Complete and ready for final inspection except for installation of propane tanks for furnace operation.

General Area: Heating oil tanks have been filled and main shop heating system is planned to be started this week. All parking areas have been completed and all guard rails installed. An inspection of the railroad by GE field survey, prior to acceptance, disclosed the curve points to be incorrectly located. This will necessitate moving of one track as much as 1 1/2' in some areas. Rain falling September 16, 1954, disclosed various low areas in the blacktop, which the paving contractor has been repairing.

The manual work force has varied from 79 to 100 personnel.

CA-561 713 Building Alterations: Work progressing satisfactorily. It is expected that facility will be completed and ready for occupancy prior to December 1, 1954.

CA-533 Official Telephone Exchange: Work progressing satisfactorily.

- Additional Office Space - Central Stores Warehouse: Project proposal submitted for final approval, prior to submission to AEC.

Twenty lineal feet of Hauserman partition and two doors were used in two 700 Area installations.

Fifteen office moves were made during the month.

Purchase requisition for approximately 333 lineal feet of panels and 75 doors, in addition to extra end filler, was processed on September 7.

New load-lugger containers and equipment have been received and placed in use. Trash wagons have been removed from the 700 Area.

1215524

Work was started on a portion of 703 Building, 5th. Wing Basement, to provide space for Patrol clothing storage.

Space requirement planning to accommodate North Richland personnel prior to transfer of camp to army is being continued.

#### General Maintenance

Five buildings at Richland barricade are being renovated, with interiors relined and repainted, floors recovered, roofs and doors repaired and repairs made to electrical services.

Approximately 800 square feet of asphalt floor tile was installed in 703 Building. A portion was laid with plywood backing and the remainder directly on original floor, after renailing and sanding. The two applications are for experimental purposes to determine advisability of further use of tile to replace the present practice of "peeling" and "resealing" floors.

Floor boards were replaced on truck beds of a semi-trailer and a cannon wagon for Transportation. Canopies are being made for installation on three weapon carriers for railroad crews.

A large glass rack was made for Central Stores.

Bulletin and blackboards were made for Transportation.

One 14' stud wall was removed and Hauserman partitions installed in 705 Building. Hauserman partitions were relocated in 762 Building.

Alterations to Central Stores lunch room were completed.

Windows along the south and west sides of the second floor of 761 and 762 Buildings were wather-stripped on the outside.

Sign painting work was heavy during the month, requiring three Saturdays of overtime for sign painter. Seventy signs were made for the AEC auction, 25 large signs for Central Stores, 41 street markers for Community, and one GE monogram sign for Employee and Public Relations. Many miscellaneous name plates and small signs were also made. Twelve hours were spent in painting signs in 300 Area.

Area glazing work was heavier than for several months, and glass was installed in 27 residential units.

Restrooms in 717-A and the women's restroom in 722-A were repainted. Fifteen offices in 703 Building and two offices in 705 Building were also repainted.

Linoleum tops were replaced on eight metal desks, and the desks refinished in office grey.

Replacement of nipples in 703 Building radiators is progressing, the second floor being complete except for vaults. Radiators are removed between 7:00 A.M. and 7:45 A.M., repaired during the day and replaced the following morning. This program will continue as long as weather permits.

A steam coil was installed in the air cooling duct at 760 drafting room to supply fresh air make-up during winter months.

The repair of radiator valves in 705, 721, 760 and 761 Buildings is 75 % complete.

Four small sand traps were installed in waterline in 69-X Buildings, to trap sand which interferes with photo developing.

Spare condensate meter was installed at Richland Jewelry, for purpose of determining quantities of steam consumed for heating.

New shaft and bearings were installed on induced draft fan at Central Stores Warehouse.

Oil stoves, replacing wood burning stoves, were installed in five patrol buildings and at railroad crossings.

New metal steps were made and installed at the south entrance to fifth wing, 703 Building, to correct safety hazard existing with original steps because of heavy traffic.

Steam boilers were repaired at Transportation hot-mix plant and at Community fire stations.

Expanded metal screens were installed over windows at Riverland power house and other buildings to discourage break-in after personnel moves to the new Transportation facility.

Twenty-five metal desks and tables were repaired and 90 pieces of office furniture and cabinets were assembled.

Hot plates and coffee percolators in 700 Area were inspected and a report made on their condition, following which necessary repairs were made.

Fire alarms and electrical circuits were inspected and repaired at Central Stores, Hospital and 700 Area buildings.

Ten buzzer systems were installed in 700 Area buildings.

Telephone battery charging generator was repaired and installed. New telephone rectifier was installed.

Central Stores electric lift trucks were inspected, cleaned, and repaired as necessary. Twenty electric heaters were also repaired.

A portable emergency generator was hooked up at the hospital and all electricians were instructed on start-up of unit in case of emergency.

Repairs were made to all safe combinations on vault doors in 234-5 Buildings.

Panic hardware was reinstalled on door at 747 Building.

## Building Services

Absenteeism of Building Service personnel has been heavy all month, making it necessary to shift schedules and use floor servicemen for janitor work.

## Steam Operation

No. 1 boiler was in service at the beginning of the month, with Nos. 2 and 3 in reserve and No. 4 awaiting repair parts.

On September 30, No. 2 boiler was placed in service, with No. 1 being removed from the line and reverting to reserve status.

Biennial major overhaul of No. 3 boiler was begun during the month.

At the close of the month boiler status was as follows: No. 2 in service, No. 1 in reserve, No. 3 undergoing major overhaul and No. 4 awaiting stoker repair.

Numerous main and branch steam lines, which had been shut off during the summer to reduce line loss, were energized in preparation for the approaching heating season. Heating steam was supplied to a considerable number of buildings during the latter part of the month.

The quantity of steam generated at the 784 Plant was 13.7% greater than for the same period of the previous year.

On September 2, a representative from the Travelers Insurance Company inspected No. 4 boiler, No. 1 sodium-zeolite softener, and No. 2 hydrogen-zeolite softener.

A test run of the Central Stores Heating Plant boiler was made during the month.

All fuel tanks at the new consolidated transportation facility were filled, i.e. the 12,000 gallon tank at the Main Shops with No. 5 fuel oil, the two 100 gallon cylinders at the same location with Propane, the 5,000 gallon tank at the dispatcher's building with No. 5 fuel oil, and the 1,030 gallon tank at the latter building with kerosene.

Coal Consumed: 616.60 net tons.

Steam generated:	8,780.1 M. Lbs.
Steam leaving plant:	7,533.4 M. Lbs.
Steam delivered:	5,445.4 M. Lbs.

Total water softened:	1,349,200 gallons
Total soft water sent to Kadlec Hospital:	128,700 gallons
Total soft water sent to 784 Heating Plant:	1,220,500 gallons

## SECURITY AND PATROL

### Document Report

Number of classified documents and prints unaccounted for as of  
September 1: 363  
(121 of the above 363 documents are chargeable to  
E. I. du Pont de Nemours & Co.)

1215527

Ja-11

Document Report (Contin)

Number of classified documents and prints reported as unaccounted for during September:	1
Number of classified documents and prints either recovered or downgraded during September:	6
Prints, previously unaccounted for, which were determined to have been inadvertently destroyed as unclassified material:	9
Number of classified documents and prints remaining unaccounted for as of October 1: (121 of the above 349 documents are chargeable to E. I. du Pont de Nemours & Co.)	349

The Non-Technical Document Review Board held four meetings during September, and reviewed a total of 243 documents. Of this number -

- 164 were downgraded to "Official Use Only",
- 31 were declassified,
- 43 had their classification retained, and
- 5 were not within the scope of the Board.

Security Education

Two Security items appeared in the Works NEWS during the month.

There were 342 security meetings held and attended by 4,509 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:

- "Words are Weapons" was shown at six meetings, each with an average attendance of twenty employees.
- "The Calculated Risk" was shown at three meetings, each with an average attendance of 41 people.
- "The Tallest Shadow" was shown at one meeting with 27 employees present.
- "Signal 99" was shown at two meetings, each with an average attendance of 36 people.
- "The Man on the Left" was shown at two meetings, each with an average attendance of 25 employees.
- "Fitting 'U' Into Security" was shown at one meeting with 24 people present.

The following security posters were distributed and posted in the plant areas during the month:

650 copies of the poster "Identify Visitors - Saboteurs Destroy Jobs" were posted.

100 copies of the poster with the slogan "Plant Security is Your Security", which were supplied by the Department of Defense, Washington, D.C., were posted.

1215528

1,100 copies of the pamphlets with the slogan "Plant Security is Your Security" also supplied by the Department of Defense, were distributed to employees.

Security Field Memorandum entitled "Revised Procedure for Intra-Plant Pick-Up and Delivery of Classified Blueprints, Tracings, and Specifications" was distributed on September 20.

A memorandum entitled "Use of Special Containers for Disposal of Classified Scrap" was distributed on September 22.

Security Field Memorandum to all department and section managers, entitled "Authorization for Granting Individuals Access to 'Restricted Data' Prior to Completion of Security Clearance Procedure", was issued September 23.

One hundred and nine employees of the General Electric Company received a "Q" security orientation talk from either a representative of Security or a Security Patrol supervisor during the month of September, 1954.

Statistical Report of Security Patrol Activities

	<u>100-B</u>	<u>100-D</u>	<u>100-F</u>	<u>100-H</u>	<u>100-K</u>	<u>200-W</u>	<u>300</u>
Pat Searches	99	99	49	6	0	0	5
Escorts	10	10	8	25	7	52	53
Ambulance Runs	2	1	3	0	0	5	2
Passes issued:							
Temporary one day	72	13	7	16	0	46	57
Travel	0	0	0	0	0	0	60
Red Tag	181	121	37	45	0	446	154
Telephonic	0	0	0	0	0	0	16
Supervisor's Post Contacts	410	244	259	280	316	725	310

Other Security Patrol Activities (Computed by Hours):							300 & 700
Security File Check	184	267	193.3*	175.75*	483	616	1,518
Security Building Check	321	33			511	616	792

\* In the 100-F and 100-H Areas, the Security File Check and Building Check are combined into one figure.

Arrest Report:

<u>Violations</u>	<u>Number of Violations</u>	<u>Cases Cleared</u>	<u>Fined</u>
Speeding	2	2	2
Negligent Driving	1	1	1
	<u>3</u>	<u>3</u>	<u>3</u>
Citation Tickets issued:	3		
Warning Tickets issued:	54		

### Security Patrol Training Activities

162 Security Patrolmen received classroom instruction during the month.  
200 Security Patrolmen received firearms training during the same period.

Training courses were as follows:

Safety Class	1/2 hour
Security Class	1/3 hour
Operations Class	1 hour

### Security Patrol Post Changes

On September 18, the 2101 Badge House post, 200-E Area, was discontinued and at that time the 2101 Area was downgraded in security classification from an "exclusion" to "limited" area status.

On September 1, the BK Construction Foot Patrol post was established around-the-clock in the 200-East Area.

The 202-A Control Room, BK Construction, was established in 200-E Area on September 20, and will be operated on the day shift only.

The 202-A Building Rover post was established also on September 20, and will be operated on all shifts.

### Unaccounted for Document Status as of September 30, 1954

<u>Material</u>	<u>Classifications</u>			<u>Total</u>
	<u>Top Secret</u>	<u>Secret</u>	<u>Confidential</u>	
Documents	0	119	18	137
Prints	0	77	9	86
Drawing Schedules	0	2	0	2
Specifications	0	3	0	3
Tracings	0	0	0	0
	—	—	—	—
Totals	0	201	27	228

On September 22, Engineering Reproduction established a classified messenger service for the delivery and pickup of classified prints, similar to the messenger service for classified document delivery and pickup service.

### General

On September 29, eight of the 32 gun racks which will hold the 12 gauge riot guns were installed in the Patrol vehicles. The remaining ones will be installed as soon as possible. Also, at this time, all Patrol sedans were equipped with a .30 caliber carbine and .45 caliber Thompson sub-machine gun.

The Security Field Inspection group assisted during the plant tour of the areas and monitored conferences and meetings held when the Vice Presidents of the General Electric Company visited the Hanford Atomic Products Operation on September 30 and October 1.

The Material and Package Pass procedure is presently being revised to strengthen the system.

In order to obtain more specific information as to material flow, the Material and Package Card Pass will be discontinued as of January 1, 1955, and will be replaced by an Authorization Card Pass which will permit the bearer to sign a One-Day Material Package Pass at the barricade for the occasional removal of material. This pass will not permit the removal of classified documents or contraband through the barricade.

In order to accommodate persons who must regularly transport classified documents through the barricade, a symbol "A.M." (Authorized Messenger) will be placed on the photo identification pass. This will then permit the transporting of classified documents through any of the barricades. To service the employee who might, on occasion, be required to transport a classified document through the barricade, the One-Day Material and Package Pass listing the document numbers and classifications will be utilized. In these cases, Security will investigate after the fact to assure that such removal was necessary. This revised procedure has the full concurrence of the Internal Audit Group.

#### Security Administration

Daily Badge Log Entries:	2,996
"Q" Clearances	109
Formal "P" Clearances issued:	55
"P" Approval Clearances issued:	34
Category access granted:	40
Category access withdrawn:	64
Category access revised:	78

#### Rephotographing Program

Number of "A" badges:	43
Number of "B" badges:	221
Photos for passes	32
Number of persons rephotographed	33

---

329

**DECLASSIFIED**

**HANFORD ATOMIC PRODUCTS OPERATION**  
General Electric Company  
Richland, Washington

**REPORT OF VISITORS FOR PERIOD ENDING SEPTEMBER 30, 1954**

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>	
					<u>Class.</u>	<u>Unclass. Areas</u>
<b>EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT</b>						
I. Visitors to this Works						
A. M. Anderson General Electric Company Schenectady, New York	Discuss manpower and education needs	D. W. McLenegan	9-8-54	9-10-54	X	100-N 105 200-W Redox 300 303
R. E. Albert Medical Branch U. S. Atomic Energy Commission Washington, D. C.	Discuss medical problems	W. D. Morwood	9-13-54	9-15-54	X	
L. E. Newman, Jr. General Electric Company Schenectady, New York	Discuss health and safety	W. D. Morwood	9-15-54	9-18-54	X	100-F 105-108 300 303

**ENGINEERING DEPARTMENT - ADVANCE ENGINEERING SECTION**

I. Visits to other Installations						
E. B. Montgomery to: Knolls Atomic Power Lab. Schenectady, New York	Conference on pile control and process control	W. R. Kanne	9-20-54	9-24-54	X	

**ENGINEERING DEPARTMENT - DESIGN SECTION**

I. Visitors to this Works						
R. G. Lorraine General Electric Company Schenectady, New York	Discuss dual purpose reactor program	J. R. Wolcott	9-13-54	9-17-54	X	700

**DECLASSIFIED**

DECLASSIFIED

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
G. M. Roy General Electric Company Schenectady, New York	Discuss dual purpose reactor program	J. R. Wolcott	9-13-54	9-17-54	X	700
S. Untermeyer General Electric Company Schenectady, New York	Discuss dual purpose reactor program	J. R. Wolcott	9-13-54	9-17-54	X	700
II. Visits to other Installations						
R. O. Anderson to: Aircraft Nuclear Propulsion Cincinnati, Ohio Project	Interview for employment	R. Ur F. Williams	9-1-54	9-2-54	X	
ENGINEERING DEPARTMENT - TECHNICAL SECTION						
I. Visitors to this Works						
D.O. Derby Oak Ridge National Lab. Oak Ridge, Tennessee	Classified employment interview	V. R. Cooper	9-16-54	9-17-54	X	200-E XXX 300 XXX
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile water loops	L. D. Turner G. E. Wade	8-31-54	9-2-54	X	100-D XXX 100-H 105 300 XXX; 700
H. H. Hausner Sylvania Electric Products Bayside, New York	Discuss fuel element development in connection with contract AT 30-1-GEN-366	G. E. McCullough A. G. Blassewitz	9-10-54	9-10-54	X	100-B 105-B, 105-C 300 303 700
R. J. Jordan Carbide & Carbon Oak Ridge, Tennessee	Observe UO <sub>3</sub> program	V. R. Cooper	9-16-54	9-17-54	X	200-E XXX 200-W Redox, 221-U 300-L XXX
S. Katz Carbide & Carbon Paducah, Kentucky	Attend feed meeting	V. R. Cooper	9-16-54	9-17-54	X	200-E XXX 200-W Redox, 221-U 300 XXX
G. E. Martin Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile coating loops	L. D. Turner G. E. Wade	8-31-54	9-2-54	X	100-D XXX 100-H 105 300 X; 700

DECLASSIFIED

DECLASSIFIED

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>	
					<u>Class.</u>	<u>Unclass.</u>
R. H. Miller Dow Chemical Company Denver, Colorado	Technical discussions	O. F. Hill A. E. Smith	9-15-54	9-17-54	X	200-W 234, 235 300 XXX 700
A. Radkowsky Naval Reactor Branch U. S. Atomic Energy Commission Washington, D. C.	Discuss reactor	W. J. Ozeroff	9-16-54	9-17-54	X	100-B 105-C 100-D 105 105-KE, 105-KW 300 XXX
F. J. Wall Dow Chemical Company Denver, Colorado	Discussion on measure- ment methods and labora- tory facilities	V. R. Cooper A. E. Smith O. F. Hill	9-13-54	9-17-54	X	200-W 234, 235
R. B. Weber Dow Chemical Company Denver, Colorado	Technical discussions	O. F. Hill A. E. Smith	9-15-54	9-17-54	X	200-W 234, 235 300 XXX 700
D. M. Wilsey All States employee Schenectady, New York	Instrumentation work on in-pile water loop	G. E. Wade	8-31-54	12-31-54	X	100-D XXX 100-E 105 300- XXX; 700
R. Thalgot U. S. Atomic Energy Comm. Oak Ridge, Tennessee	Observe UO <sub>3</sub> program	V. R. Cooper	9-16-54	9-17-54	X	200-W Redox, 221-U 200-E XXX 300 XXX
II. Visits to other Installations						
K. L. Adler to: Brookhaven National Lab. Upton, Long Island, New York	Discuss problems relative to underground waste storage	B. Manowitz F. Mittman	9-13-54	9-16-54	X	
G. J. Alkire to: Knolls Atomic Power Lab Schenectady, New York	Discuss mass spectrometric applications and problems	T. L. Collins F. White	9-7-54	9-10-54	X	
J. G. Bradley to: National Lead Company Fernald, Ohio	Process consultation	D. S. Arnold	9-15-54	9-17-54	X	

DECLASSIFIED

1215534

DECLASSIFIED

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class.</u>	<u>Unclass. Areas</u>
J. M. Davidson, III to: Phillips Petroleum Co. Idaho Falls, Idaho	Liaison regarding proposed facility	W. M. Pennington	9-13-54	9-15-54	X	
R. V. Dulin to: Knolls Atomic Power Lab. Schenectady, New York	Discussion of KAFL-120 loop design	T. J. E. Glasson	9-16-54 9-20-54	9-17-54 9-21-54	X X	
R. V. Dulin to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Discussion of KAFL-120 loop design	P. Cohen	9-15-54	9-15-54	X	
R. V. Dulin to: Argonne National Lab. Lemont, Illinois	Discussion of KAFL-120 loop design	L. W. Fromm	9-13-54	9-13-54	X	
J. F. Fletcher to: Phillips Petroleum Co. Idaho Falls, Idaho	Liaison regarding proposed facility	W. M. Pennington	9-13-54	9-15-54	X	
R. G. Geier to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on homogeneous reactor, aircraft reactor	G. Garrett J. A. Svarthout	9-20-54	9-21-54	X	
K. M. Harmon to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on slag and crucible recovery installations	W. M. Lewis	9-16-54	9-17-54	X	
K. M. Harmon to: Dow Chemical Company Denver, Colorado	Development work in plutonium chemistry and metallurgy	B. Weidenbaum	9-20-54	9-20-54	X	
Merle K. Harmon to: Knolls Atomic Power Lab. Schenectady, New York	Technical problems involving chemical development	J. F. Flagg W. H. Alter R. C. Feber	9-20-54	9-21-54	X	
L. A. Hartcorn to: Battelle Memorial Inst. Columbus, Ohio	Attend meeting of Cooperative Uranium Metallography Program	R. F. Dickerson	9-15-54	9-16-54	X	

1215533

DECLASSIFIED

DECLASSIFIED

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
O. F. Mill to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss metallurgical waste recoveries, UO <sub>3</sub> technology and reactivity problems and homogenous reactors	D. Lang F. L. Culler	9-20-54	9-22-54		X
O. F. Mill to: Carbide & Carbon Paducah, Kentucky	Process discussions on UO <sub>3</sub>	R. W. Levin	9-23-54	9-24-54		X
W. T. Kattner to: Mallinckrodt Chemical Wks. St. Louis, Missouri	Consultation on uranium metallurgy	W. M. Leaders	9-20-54	12-31-54		X
W. T. Kattner to: National Lead Company Fernald, Ohio	Consultation on uranium metallurgy	J. M. Ciborski	9-20-54	12-31-54		X
W. T. Kattner to: Bridgeport Brass Co. Bridgeport, Connecticut	Consultation on uranium metallurgy	R. S. French	9-20-54	12-31-54		X
W. T. Kattner to: Bridgeport Brass Co. Adrian, Michigan	Consultation on uranium metallurgy	R. M. Treco	9-20-54	12-31-54		X
W. T. Kattner to: Battelle Memorial Inst. Columbus, Ohio	Consultation on uranium metallurgy	H. R. Nelson	9-20-54	12-31-54		X
W. T. Kattner to: Ames Laboratory Ames, Iowa	Consultation on uranium metallurgy	F. H. Spedding	9-20-54	12-31-54		X
M. B. Leboeuf to: Knolls Atomic Power Lab. Schenectady, New York	Discuss hot semi-works in-like monitoring	B. F. Rider	9-27-54	9-28-54		X
W. R. Lewis to: General Electric Co. Schenectady, New York	Consultation on army packaged power plant proposal	H. E. Grantz	9-29-54	11-1-54		X

DECLASSIFIED

1215536

~~DECLASSIFIED~~

- 6 -

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class. Unclass. Areas</u>
G. E. McCullough to: Battelle Memorial Inst. Columbus, Ohio	Discussion on fuel element technology	H. R. Nelson	9-14-54	9-14-54	X
G. E. McCullough to: Knolls Atomic Power Lab. Schenectady, New York	Discussion on fuel element technology	K. R. Van Tassel	9-15-54	9-16-54	X
G. E. McCullough to: U. S. Atomic Energy Comm. Washington, D. C.	Discussion on fuel element technology	A. J. Vandervyden	9-17-54	9-17-54	X
G. E. McCullough to: Bridgeport Brass Co. Bridgeport, Connecticut	Discussion on fuel element technology	R. S. Pratt	9-20-54	9-21-54	X
G. E. McCullough to: National Lead Company Fernald, Ohio	Discussion on fuel element technology	G. Wunder	9-22-54	9-23-54	X
G. E. McCullough to: Mallinckrodt Chemical Works. St. Louis, Missouri	Discussion on fuel element technology	C. Harrington	9-24-54	9-24-54	X
L. H. McEwen to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on homogeneous reactor, aircraft reactor	G. Garrett	9-20-54	9-21-54	X
R. H. Moore to: Radiation Laboratory Berkeley, California	Consultation on irradiation damage problems	I. Perlman	9-14-54	9-15-54	X
R. L. Moore to: Knolls Atomic Power Lab. Schenectady, New York	Discuss process chemistry	J. F. Flagg	9-17-54	9-21-54	X
P. J. Pankaskie to: Bridgeport Brass Co. Bridgeport, Connecticut	Zirconium fabrication	R. S. French	9-23-54	9-23-54	X

1215537

~~DECLASSIFIED~~

DECLASSIFIED

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>		
					<u>Class.</u>	<u>Unclass.</u>	<u>Areas</u>
J. W. Riches to: Mallinckrodt Chemical Wks. St. Louis, Missouri	Consultation on uranium metallurgy	W. M. Leaders	9-20-54	12-31-54	X		
J. W. Riches to: National Lead Company Fernald, Ohio	Consultation on uranium metallurgy	J. M. Ciborski	9-20-54	12-31-54	X		
J. W. Riches to: Bridgeport Brass Co. Bridgeport, Connecticut	Consultation on uranium metallurgy	R. S. French	9-20-54	12-31-54	X		
J. W. Riches to: Bridgeport Brass Co. Adrian, Michigan	Consultation on uranium metallurgy	R. M. Treco	9-20-54	12-31-54	X		
J. W. Riches to: Battelle Memorial Inst. Columbus, Ohio	Consultation on uranium metallurgy	H. R. Nelson	9-20-54	12-31-54	X		
J. W. Riches to: Ames Laboratory Ames, Iowa	Consultation on uranium metallurgy	F.H. Spedding	9-20-54	12-31-54	X		
D. F. Snoeberger to: E. I. du Pont de Nemours & Co. Augusta, Georgia	Attend Thorium Working & Co. Committee meeting	R. T. Muntoon	9-9-54	9-10-54	X		
R. E. Tomlinson to: Brookhaven National Lab. Upton, Long Island, New York	Discuss waste processing problems	B. Manowitz	9-16-54	9-17-54	X		
G. E. Wade to: Argonne National Lab. Lemont, Illinois	Discuss KAPL-120 loop design	L. W. Fromm	9-13-54	9-13-54	X		
G. E. Wade to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Discuss KAPL-120 loop design	P. Cohen	9-15-54	9-15-54	X		

64  
2  
NS

1215530

DECLASSIFIED

**DECLASSIFIED**

Restricted Data  
Class. Unclass. Areas

Name-Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Class.	Unclass.	Areas
G. E. Wade to: Knolls Atomic Power Lab. design Schenectady, New York	Discuss KAPL-120 loop	T. J. E. Gleason	9-16-54 9-20-54	9-17-54 9-21-54	X	X	
W. C. A. Woods to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on homogenous reactor	G. Garrett J. A. Swarthout	9-20-54	9-21-54	X		
<b>ENGINEERING DEPARTMENT - DESIGN SECTION (cont'd)</b>							
J. C. Wood to: Knolls Atomic Power Lab. Schenectady, New York	Obtain information on other reactor control components	V. D. Nixon K. T. Perkins H. E. Grantz	9-27-54	10-1-54	X		
<b>FINANCIAL DEPARTMENT - SF ACCOUNTABILITY SECTION</b>							
I. Visitors to this Works							
D. F. Musser Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss GE SF Accountability Program	V. D. Donihee	9-15-54	9-24-54	X		
W. M. Swinton Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss GE SF Accountability Program	V. D. Donihee	9-15-54	9-24-54	X		
L. C. Solem Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss GE SF Accountability Program	V. D. Donihee	9-15-54	9-24-54	X		
<b>MANAGEMENT</b>							
I. Visitors to this Works							
R. G. Lorraine General Electric Company Schenectady, New York	Work for presentation to the Advisory Council	W. E. Johnson	9-13-54	9-17-54	X		100-D 105 300-L XXX

**DECLASSIFIED**

DECLASSIFIED

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>	
					<u>Class.</u>	<u>Unclass. Areas</u>
B. R. Prentice General Electric Company Schenectady, New York	Work for presentation to the Advisory Council	W. E. Johnson	9-13-54	9-17-54	X	300- XXX
G. M. Roy General Electric Company Schenectady, New York	Work for presentation to the Advisory Council	W. E. Johnson	9-13-54	9-17-54	X	100-D 105 300 XXX
S. Untermeyer, III General Electric Company Schenectady, New York	Work for presentation to the Advisory Council	W. E. Johnson	9-13-54	9-17-54	X	100-D 105 300 XXX
B. G. Voorhees General Electric Company Schenectady, New York	Work for presentation to the Advisory Council	W. E. Johnson	9-13-54	9-17-54	X	100-D 105 300 XXX
A. E. Cox Newport News Shipbuilding & Dry Dock Company Newport News, Virginia	Tour of site	W. E. Johnson	9-17-54	9-17-54	X	
R. Broad Newport News Shipbuilding & Dry Dock Company Newport News, Virginia	Tour of site	W. E. Johnson	9-17-54	9-17-54	X	
F. F. Kaiser Newport News Shipbuilding & Dry Dock Company Newport News, Virginia	Tour of site	W. E. Johnson	9-17-54	9-17-54	X	
J. H. Smith Newport News Shipbuilding & Dry Dock Company Newport News, Virginia	tour of site	W. E. Johnson	9-17-54	9-17-54	X	
J. D. Lockton General Electric Company New York, New York	Meeting of advisory council	W. E. Johnson	9-30-54	10-1-54	X	100-B 105-C 200-W Redox 300 303

DECLASSIFIED

DECLASSIFIED

Restricted Data  
Class. Unclass. Areas

Name - Organization Purpose of Visit Person Contacted Arrival Departure

MANUFACTURING DEPARTMENT

I. Visits to other Installations

S. M. Gill to: National Lead Company Fernald, Ohio Discuss uranium slug quality control C. M. Walden J. M. Ciborski 9-20-54 9-23-54 X

J. E. Maider, Jr. to: General Electric Company Schenectady, New York Discuss various atomic activities in which Company is engaged R. J. Cordiner 9-27-54 9-27-54 X

E. W. O'Rorke to: Bridgeport Brass Adrian, Michigan Discuss quality aspects and uranium fabrication techniques of fuel elements R. S. Pratt 9-20-54 9-21-54 X

E. W. O'Rorke to: National Lead Company Fernald, Ohio Discuss quality aspects and uranium fabrication techniques of fuel elements G. Wunder 9-22-54 9-23-54 X

E. W. O'Rorke to: Mallinckrodt Chem. Wks. St. Louis, Missouri Discuss quality aspects and uranium fabrication techniques of fuel elements C. D. Harrington 9-22-54 9-24-54 X

E. W. O'Rorke to: Oak Ridge National Lab. Oak Ridge, Tennessee Discuss quality aspects of fuel element components J. M. Herndon 9-23-54 9-24-54 X

RADIOLOGICAL SCIENCES DEPARTMENT

I. Visitors to this Works

J. W. Baum University of Rochester Rochester, New York Discuss neutron dosimetry H. M. Parker D. W. Pearce 9-3-54 9-4-54 X

N. S. Hall Division of Biology & Medicine U. S. Atomic Energy Commission Washington, D. C. Discuss current investi- gations on soil studies 121554 M. A. Kornberg 9-10-54 9-10-54 X 100-F 108 200-W 222-U

DECLASSIFIED

**DECLASSIFIED**

Restricted Data  
Class. Unclass. Areas

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Class.</u>	<u>Unclass.</u>	<u>Areas</u>
----------------------------	-------------------------	-------------------------	----------------	------------------	---------------	-----------------	--------------

X 100-F 108

9-17-54

9-18-54

H. A. Kornberg

Inspect facilities and discussion of program

L. E. Newman  
General Electric Company  
Schenectady, New York

II. Visits to other Installations

X

9-28-54

10-3-54

A. M. Brues

Attend bio-medical directors' meeting

H. A. Kornberg  
to: Argonne National Lab.  
Lemont, Illinois

X

9-20-54

9-22-54

J. J. Fitzgerald  
H. Liebhafsky

Radiological sciences  
Lab. consultation

J. M. Nielsen  
to: Knolls Atomic Power Lab.  
Schenectady, New York

X

9-23-54

9-24-54

J. C. Bugher  
W. D. Claus

Radiological sciences  
& Medicine consultation

E. M. Parker  
to: Division of Biology & Medicine  
U. S. Atomic Energy Commission  
Washington, D. C.

X

9-29-54

10-1-54

Meeting of Radiation Protection Panel and Bio-Medical Directors

D. W. Pearce  
to: Argonne National Lab.  
Lemont, Illinois

PLANT AUXILIARY OPERATIONS DEPARTMENT - OPERATIONS ANALYSIS SECTION

I. Visitors to this Works

X

9-17-54

9-17-54

Convert classified documents accountability records to IBM punch cards

R. S. Fisher  
Phillips Petroleum Company  
Idaho Falls, Idaho

X

9-15-54

9-16-54

Liaison for shipper-receiver differences

F. J. Wall  
Dow Chemical Company  
Denver, Colorado

II. Visits to other Installations

X

9-16-54

9-17-54

Consultation on "Bluenose" Project

C. A. Bennett  
to: Division of Research  
U. S. Atomic Energy Commission  
Washington, D. C.

**DECLASSIFIED**

PURCHASING AND STORES SECTION  
PLANT AUXILIARY OPERATIONS DEPARTMENT  
SUMMARY SEPTEMBER 1954

STATISTICAL AND GENERAL

Funds have been appropriated on Project CG-598 for procurement of a Vacuum Acid Fractionator. Because of the nature of this fractionator the requisition covers both design and fabrication. A letter order will be written to cover the design and the submission of fixed prices prior to processing of a formal purchase order.

The vendor for the boron carbide rings for the horizontal rods on Project CG-558 has had considerable difficulty furnishing acceptable rings. To assist the vendor in manufacturing and to speed up delivery, a Technical Engineer has been loaned to the vendor to act in an advisory capacity.

Present stocks and delivery schedules of all fabricated aluminum items for Metal Preparation Section appear to be adequate, with the single exception of 9-1/2" aluminum cans. On this item Alcoa has encountered a high rejection rate, but has agreed to increase production to compensate.

On January 25, 1954 back orders on hand for General Supplies material totaled 2073. As of September 24, 1954 there were 227 on hand or a reduction of 1846 from the January figure and an increase of one over the August 30, 1954 total. These 227 back orders cover 138 line items which represent .6% of the approximate 25,000 line items in this account.

The General Supplies inventory taken on September 20, 21, and 22, 1954 was completed on schedule; however, the final results are not yet known.

Preparation of surplus material for the auction sale is progressing very satisfactorily. This has been a huge undertaking and the Transportation Section and AEC have given good cooperation.

The financial responsibility for returnable containers was transferred from Accounts Payable to Stores where it is combined with the physical control of returnable containers.

During September material and equipment valued at \$42,000 were withdrawn from excess accounts for use on the Project.

<u>Organization and Personnel</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>Change</u>
Employees on Roll	287	282	-5

PURCHASING AND STORES SECTION  
ADMINISTRATION UNIT  
SEPTEMBER 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.

<u>September 1954</u>	<u>Government Agency</u>	<u>Small Business</u>	<u>Big Business</u>	<u>Educational and Other</u>
\$0 - \$ 24.99	\$	\$ 4,046.47	\$ 2,093.79	
\$25 - \$ 499.99		108,069.42	62,499.64	
\$500 - \$ 24,999.00	2,214.69	306,662.57	401,193.19	
\$25,000 - \$ Up		53,220.00	320,567.00	

Number of Actions	2	1,379	784
-------------------	---	-------	-----

Vendor Contacts . . . . .	197
Damage Reports Processed . . . . .	9
Over & Short Reports Processed . . . . .	1
Accounts Payable Requests Handled . . . . .	269
Difference Slips Processed . . . . .	42
Clearance Slips & Purchase Order Change Approvals . .	244
Material Exception Reports . . . . .	225
Return Orders Issued . . . . .	165

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

	<u>Items Processed</u>	<u>Items Received</u>	<u>*Value of Items Rec'd.</u>	<u>** Cost of Items Rec'd.</u>	<u>Savings to H.A.P.O.</u>
Previous Balance	318	6	\$ 26,949.60	\$10,452.77	\$16,496.83
Combined	2,697	447	\$128,738.55	\$63,849.17	\$64,889.38
Totals	3,015	453	\$155,688.15	\$74,301.94	\$81,386.21

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

PURCHASING AND STORES SECTION  
ADMINISTRATION UNIT

Requisitions on hand	<u>G</u>	<u>D</u>	<u>Total</u>	
Operations Procurement	663	0	663	
Construction Procurement	0	177	177	
A.E.C. Procurement	<u>220</u>	<u>88</u>	<u>308</u>	
Total	883	265	1148	
Requisitions Assigned during Sept.				
Operations Procurement	1804	0	1804	
Construction Procurement	0	431	431	
A.E.C. Procurement	<u>366</u>	<u>88</u>	<u>454</u>	
Total	<u>2170</u>	<u>519</u>	<u>2689</u>	
Requisitions Placed during Sept.				
Operations Procurement	1777	0	1777	
Construction Procurement	0	484	484	
A.E.C. Procurement	<u>431</u>	<u>118</u>	<u>549</u>	
Total	<u>2208</u>	<u>602</u>	<u>2810</u>	
Requisitions on hand 9-30-54				
Operations Procurement	690	0	690	
Construction Procurement	0	124	124	
A.E.C. Procurement	<u>155</u>	<u>58</u>	<u>213</u>	
Total	<u>845</u>	<u>182</u>	<u>1027</u>	
Purchase Orders Placed	<u>HW</u>	<u>HWC</u>	<u>Total</u>	
Operations Procurement	1521		1521	
Essential Material	24		24	
Construction Procurement		469	469	
Local Purchase	<u>9</u>	<u>1</u>	<u>10</u>	
Total	<u>1554</u>	<u>470</u>	<u>2024</u>	
Value of Orders Placed				
Operations Procurement	\$514,701.72	\$	\$514,701.72	
Essential Material	404,119.35		404,119.35	
Construction Procurement		334,100.52	334,100.52	
Local Purchase	<u>58.34</u>	<u>7.30</u>	<u>65.64</u>	
Total	<u>\$918,879.41</u>	<u>\$334,107.82</u>	<u>\$1,252,987.23</u>	
Alterations Issued	<u>Increase</u>	<u>Decrease</u>	<u>No Change</u>	<u>Total</u>
HW Operations	42	39	20	101
Essential Material	2			2
HWC Construction	<u>27</u>	<u>15</u>	<u>6</u>	<u>48</u>
Total	<u>71</u>	<u>54</u>	<u>26</u>	<u>151</u>
Value of Alterations Issued	<u>Increase</u>	<u>Decrease</u>		<u>Total</u>
HW Operations	\$3,275.40	\$7,101.95		\$10,377.35
Essential Material	2,103.00			2,103.00
HWC Construction	<u>11,845.78</u>	<u>2,477.05</u>		<u>14,322.83</u>
Total	<u>\$17,224.18</u>	<u>\$9,579.00</u>		<u>\$26,803.18</u>

PURCHASING AND STORES SECTION  
CONSTRUCTION PROCUREMENT UNIT  
SEPTEMBER, 1954

Requisitions have been received for the 10,400 G.P.M., 1,400 ft. head pumps, and the 4500 HP synchronous motor, speed increaser, flywheel drives. The requisition for the drives has been referred to the Atomic Energy Commission Procurement Section for purchasing. The bid list for the pumps was discussed with the Commission and we have their agreement on the nine pump manufacturers which have been invited to submit bids.

Money has been appropriated on Project CG-598 for the procurement of a Vacuum Acid Fractionator. Because of the nature of this fractionator, the requisition covers both design and fabrication. A Letter Order will be written to cover the design and the submission of fixed prices prior to the processing of a formal purchase order. By using a Letter Order to cover the design, the Engineering Department will have an opportunity to approve the design prior to the formal purchase order.

Our purchase order HWC-5172 was placed with the Asco Sintering Co., Los Angeles for the boron carbide rings for the horizontal rods being installed on Project CG-558. This Company has had a great deal of trouble furnishing acceptable rings. In order to assist them in their manufacturing, and to speed up delivery, we have loaned them a Technical Engineer to assist in an advisory capacity. Satisfactory rings have been produced in experimental runs of approximately twenty-five. The problems encountered in attempting adequate production quantities have not been solved. Work is continuing and we hope to be able to speed up production.

On purchase order HWC-5147 placed with the Aluminum Co. of America for 81 aluminum extrusions for the horizontal rods, we find that even though the Aluminum Co. of America furnished the prototype extrusions, they are having considerable trouble furnishing acceptable extrusions for this production order. Numerous runs have been tried without success. The last run produced a total of 36 tubes and it was thought that 19 would be acceptable after re-work, but after attempting to bring within tolerance, none were accepted. We are still optimistic that the Aluminum Co. of America will be able to solve their production difficulties, as we have known them to be in similar circumstances during the developmental stages on several of our past orders for specially designed extrusions.

On September 22, 1954 Mr. S. B. Halston joined our Expediting Unit and will assist Mr. M. A. Williams in his Procurement Status and Control Group.

Organization and Personnel  
Employees on Roll

8-31-54  
28

9-30-54  
29

Change  
1

PURCHASING AND STORES SECTION  
OPERATIONS PROCUREMENT UNIT

SEPTEMBER - 1954

Statistical and General

Present stocks and delivery schedules of all fabricated aluminum items for Metal Preparation Section appear to be adequate, with the single exception of 9-1/2" aluminum cans. On this item Alcoa has encountered a high rejection rate, but has agreed to increase production to compensate.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate - supplemental contract still with Commission for signature.
2. Nitric Acid - record of purchase for extension of contract for the 13-month period, requested by the Commission, is being presented to the Commission for approval. Contract will be written as soon as record of purchase is approved.
3. Liquid Carbon Dioxide - contract completed and in force.
4. Caustic Soda - supplemental contracts with General Electric Co. for signature.
5. Steam Coal - contracts completed and in force.
6. Sulfamic Acid - contract signed by vendor and presently with General Electric Co. for signature.
7. Ferrous Ammonium Sulfate - contract has been signed by vendor and submitted to Mr. Maider for signature.

Organization and Personnel

	<u>8-31-54</u>	<u>9-30-54</u>	<u>Change</u>
Employees on roll	35	34	- 1

PURCHASING AND STORES SECTION  
STORES UNIT  
SEPTEMBER 1954

STATISTICAL AND GENERAL

The physical inventory of General Supplies, consisting of approximately 18,400 items located in 13 warehousing locations, was made September 20 thru 22, 1954. The back log of work, resulting from closing down for the inventory, was processed rapidly and work was on a current basis within two days after the inventory was completed.

The move of Spare Parts from 200 West Area to 2101 East Building has been held up pending installation of bins and pallet racks which is now 95% completed. The transfer of all material should be completed in October.

Standby Account 0411 was established to account for parts and material held for facilities in "Standby" or for emergency purposes. Transfer of material to this account has not been made as yet.

A total of 1312 items were added to the Spare Parts and Spare Equipment Accounts during the month. The items cover both the presently operating and new process facilities.

All records pertaining to the forthcoming surplus auction sale were isolated from current and active records and identified by lot numbers. Acquisition price totals for each lot was furnished to AEC for determination of minimum acceptable bids.

Preparations are underway to move automotive parts from three locations in the 700-1100 Area to the new Transportation Facility.

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

Disbursements by store order	\$ 41,531
Transfers to inventories	198
Offsite shipments	103,120
Receipts	197,120

<u>Organization and Personnel</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>Change</u>
Employees on Roll	190	185	-5

PURCHASING & STORES SECTION

TRAFFIC UNIT

September, 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 September amounting to \$2,803.12. This makes a total savings from September 1, 1946, to date of \$1,775,349.28.

Savings Report

1. Rate reductions obtained from carriers:

<u>Commodity</u>	<u>Origin</u>	<u>Savings for</u> <u>September, 1954</u>	<u>Savings from 9-1-46</u> <u>thru August, 1954</u>	<u>Savings from</u> <u>9-1-46 to date</u>
Aluminum Sul- phate (Liquid)	Portland, Ore.	\$ 960.41		
Aluminum Ex- trusions	Edgewater, N.J.	520.18		
Sodium Bich- romate (Liquid)	Painesville, Ohio	<u>1,322.53</u>		
		\$2,803.12	\$1,772,546.16	\$1,775,349.28
2. Freight Bill Audit		1,342.86	129,432.75	130,775.61
3. Loss & Damage & Over- charge claims		273.20	138,848.77	139,121.97
4. Ticket Refund Claims		862.76	41,748.28	42,611.04
5. Household Goods Claims		<u>-</u>	<u>17,641.85</u>	<u>17,641.85</u>
		\$5,281.94	\$2,100,217.81	\$2,105,499.75

Work Volume Report

Completed Travel Requests		174
Reservations resulting from above:	Rail	69
	Air	240
	Hotel	211
Expense Accounts Checked		212
Household Goods & Automobiles	Movements Arranged Inbound	6
	Movements Arranged Outbound	1
	Insurance Riders Issued	5
	Insurance Bills Approved	5
	Furniture Repair Orders	1

Jb-7

1215549

PURCHASING & STORES SECTION  
TRAFFIC UNIT  
September, 1954

Work Volume Report (cont.)

Ticket Refund Claims	Filed	13
	Collected - Number	14
	Collected - Amount	\$862.76
Freight Claims	Filed	8
	Collected - Number	5
	Collected - Amount	\$273.20
	Over and Shorts Processed	18
	Damage Reports Processed	12
Freight Bill Audit Savings		\$1,342.86
Freight Shipments Traced		39
Quotations	Freight Rates	229
	Routes	229
Bills Approved	Air Freight	1
	Air Express	19
	Boat	4
	Carloading	206
	Express	100
	Rail	905
	Truck	274
Carload Shipments	Inbound	999
	Outbound	5

Report of Carloads Received

<u>Commodity</u>	<u>GMSTP&amp;P</u>	<u>NP</u>	<u>UP</u>	<u>TOTAL</u>
Acetic Acid		1		1
Aluminum Extrusions			1	1
Aluminum Ingots			1	1
Alumina Sulfate (Liquid)	2	3	3	8
Aluminum Sulfate (Dry)	1	2	2	5
Bichromate of Soda		2		2
Building Brick	1			1
Caustic Soda	18	13	24	55
Chlorine	1	2	2	5
Coal	295	134	447	876
Flat Cars	2			2
Lime			1	1
Methyl Isobutyl Ketone			1	1
Nitric Acid		16	2	18
Phosphoric Acid		2		2

PURCHASING & STORES SECTION  
TRAFFIC UNIT  
 September, 1954

Report of Carloads Received (cont.)

<u>Commodity</u>	<u>CMSTP&amp;P</u>	<u>NP</u>	<u>UP</u>	<u>TOTAL</u>
Salt		3	1	4
Soda Ash	5	1	1	7
Steel Bars		2		2
Steel Condensers	1			1
Sulphuric Acid			1	1
Merchandise & Stop Cars		<u>3</u>	<u>2</u>	<u>5</u>
Total	326	184	489	999

<u>Organization &amp; Personnel</u>	<u>8-31-54</u>	<u>9-30-54</u>	<u>Change</u>
	9	9	0

[REDACTED]

TRANSPORTATION SECTION  
MONTHLY REPORT  
September 1954

DECLASSIFIED

Transportation Section personnel forces decreased from 492 to 489 by four new hires, one transfer in, two transfers out, four terminations, and two deactivations - personal illness.

Construction of the new Consolidated Transportation Facility was 97.5% complete as of September 24 (the reported 97% on August 27 was revised to 94% following re-evaluation). It is estimated that the Main Shops and the Dispatch Building will be ready for occupancy about October 15. Supporting operations and general offices will be occupied shortly thereafter. A target date of December 1 has been set for complete evacuation of construction personnel.

Twenty-five pieces of stationary shop equipment were released to the contractor for movement to the new Consolidated Transportation Facility during the month. Mechanical personnel temporarily displaced from motor room work by this transfer are being gainfully utilized in the winterizing program.

Established expense code G-67114 to cover the direct costs of moving from present scattered locations to the new Consolidated Transportation Facility. Costs will be accumulated in suspense with an appropriate liquidation after actual expenditures become known.

Records on cost, maintenance procedures, and procurement practices were made available to L. Miasga on September 20. Mr. Miasga has been engaged in reviewing and discussing these matters with appropriate personnel of the Transportation Section since that date.

Prepared functional, alphabetical, and numerical telephone listings for the Transportation Section to be included in the new Plant directory. Changes necessitated by the forthcoming move to the new Consolidated Transportation Facility have been ascertained so the new directory will contain up to date listings.

An agreement has been reached with the landlord as to the requisitioning and ordering of heating fuels for the new Consolidated Transportation Facility. Representatives of the Inventory Accounting Unit and the Atomic Energy Commission have verbally indicated their concurrence.

Completed the Midyear Budget Review for FY 1955 and FY 1956 on Office Furniture and Equipment Requirements for the Transportation Section.

Prepared a special statistical report containing cost and volume data on off-Plant chauffeured trips for Company business, official visitors, and transporting overtime personnel. This information was supplied for discussion purposes with a local firm which had expressed an interest in rendering the service.

Completed the review of the rough draft report on railroad process service by R. T. Jaske of the Engineering Department. Written comments were furnished to Mr. Jaske as requested.

~~XXXXXXXXXX~~

Transportation Section

The standard IME rate of 90% for the Heavy Equipment Maintenance Unit was reduced to 75% effective with the liquidation of September costs.

Collaborated with the General Cost Unit and the Manufacturing Cost Unit on financial and allied matters that will be affected by the transfer of the Transportation Section to the Manufacturing Department.

Completed the assignment of 25 new pickup trucks on a replacement basis. The 25 replaced units were excessed by September 17 as requested by the Atomic Energy Commission so they can be included in the auction on October 11. Assignment of the remaining 31 units is in progress and excessing of the replaced vehicles will follow.

A report is being prepared at the request of the Atomic Energy Commission on all automotive equipment to be sold at the auction on October 11. Data as to make, type, model, mileage, horsepower, shipping weight, serial number, and operating conditions are being supplied for each vehicle.

The equipment for the trash handling system procured for the 100 and 700-1100 Areas has been placed in service. This equipment completes a program started in 1952 to provide all Plant operations, except Community, with a standardized, one manufacturer, modern, industrial, trash handling system.

Commercial rail traffic during September increased by 444 cars or 24% over August as receipts of coal and other essential material were higher. The following recapitulation indicates the distribution of commercial cars handled:

<u>Carload Movements</u>	<u>-</u>	<u>Loads In</u>	<u>Empties In</u>	<u>Loads Out</u>	<u>Empties Out</u>
General Electric Company		981	17	20	995
A.E.C.		73	0	0	56
A.E.C. Kaiser (cement)		11	0	0	12
Blaw-Knox		22	0	0	25
Dukes Electric Co.		1	0	0	1
L. H. Hoffman		2	0	0	2
L. A. Hopkins		6	0	0	5
Kaiser Engineers		6	0	0	7
Sound Construction Co.		2	0	0	7
U. S. Army		<u>17</u>	<u>3</u>	<u>3</u>	<u>15</u>
		1,121	20	23	1,125

Railroad process service during September decreased by two cars or 1.82% over August and required 306 overtime hours.

Total car movements including process service totaled 2,649 in September compared to 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.

DECLASSIFIED

Transportation Section

Radiation Monitoring personnel surveyed the low water tank at Riverland on September 10 and found no detectable contamination. Release papers were forwarded with the Property Disposal Report to the Property Management Unit for disposition.

Completed the overhaul of the No. 1 diesel engine on locomotive 39-3722 and released this unit for work on September 17. Installed new main bearings and cylinder linings. Cylinder heads were sent off-plant for reconditioning.

Ground the commutators on the No. 3 traction motors of locomotive 39-3730 and installed new brushes. This completes the reconditioning of commutators and it is believed that the problem of brush breakage has been eliminated.

The Plant Bus System transported 95% fewer passengers in September than in August. The following statistics indicate the magnitude of service rendered:

Passenger volume	143,339
Revenue - bus fares	\$ 7,166.94
Earnings - transit advertising (August)	\$ 85.14
Bus trips	6,672
Bus miles - passenger carrying	187,339
Passenger miles	4,708,960

The relocations of approximately 30 shuttle bus stop signs is under way in connection with the forthcoming move to the new Consolidated Transportation Facility. The G.E. News has publicized the matter including time schedules and a map depicting the revised shuttle routes.

The Richland Bus System transported 23.9% more passengers in September than in August. The beginning of a new public school term is largely responsible for the marked increase in patronage. The following statistics indicate the volume of service rendered:

Total passengers including transfers	9,879
Revenue - bus fares	\$ 670.69
Earnings - transit advertising (August)	\$ 3.87
Bus trips	1,200
Bus miles - passenger carrying	6,360
Passenger miles	30,000

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 95 which were rendered to the following locations:

Benton City, Wash.	6	Richland "NY", Wash.	1
Grandview, Wash.	4	Spokane, Wash.	1
Hinkle, Oregon	4	Sunnyside, Wash.	4
Kennewick, Wash.	9	Walla Walla, Wash.	1
Pasco, Wash.	42	West Richland, Wash.	3
Pendleton, Oregon	15	Yakima, Wash.	4
Prosser, Wash.	1		

[REDACTED]

Transportation Section

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

	<u>Gasoline</u>	<u>Diesel Fuel</u>	<u>50 Cetane</u>	<u>Kerosene</u>	<u>White Gas</u>
Stock at start of month	33,575	29,705	8,000	1,745	220
Received during month	116,141	12,100	32,100	1,732	0
Dispensed during month	116,756	19,415	31,200	1,297	70
Stock at end of month	32,960	22,390	8,900	2,180	150

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

Motor Overhauls	41
Class A Inspections and Repairs	101
Class B Inspections and Lubrications	1143
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	82
Semi-Monthly Inspections - Buses	157
Monthly Inspections - Railroad Rolling Stock	9
Other Routine Maintenance Repairs and Service Calls	2143
Accident Repairs and Paint Jobs	37
Tire Repairs	449
Wash Jobs	519
Vehicles Decontaminated	<u>23</u>
	4,704

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

<u>Code</u>	<u>Type</u>	<u>No. of Units</u>	<u>Total Mileage</u>
1A	Sedans	381	493,024
1B	Buses	103	188,220
1C	Pickup Trucks	409	198,709
1D	Panel, Carryall, Sta. Wagon	172	135,045
1G	Jeeps	2	1,376
1H	Power Wagons	50	21,603
1J	Armored Cars	2	16
68 Series	Trucks	<u>221</u>	<u>77,332</u>
		1,340	1,115,325

The winterizing of HO equipment was begun on September 20 and is approximately 45% complete. Antifreeze solution has been prepared in a 50-50 mixture for all water cooled equipment and will withstand temperatures to 30° below zero.

1215555

[REDACTED]

Jc-4

**DECLASSIFIED**

DECLASSIFIED

Transportation Section

Transportation forces are now making a daily delivery and pickup of radiation monitoring instruments to all areas.

Began plowing operations to cover contamination in the 200-West Area following procurement of special equipment.

Approximately 1,000 man-hours were required during September in the arranging of material and equipment for the auction on October 11.

Completed the movement of spare parts from the 200-West Area to the 2101 Building in the 200-East Area. This work was begun in August and required two motor cranes, two hysters, four semi-trucks, and approximately 1,150 man-hours.

Maintenance of primary roads required 666 man-hours; secondary roads 8 man-hours; walkways, parking facilities, and other ground maintenance in the manufacturing areas required 730 man-hours; and covering contamination in the vicinity of the 200-West Area required 407 man-hours.

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

	<u>MC 3</u>	<u>MC 5</u>
Stock at start of month	50.4	4.4
Received during month	0	0
Used during month	9.7	0
Stock at end of month	40.7	4.4

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

	<u>3/4" to 0 Pre-mix Tons</u>	<u>1/2" to 0 Pre-mix Tons</u>	<u>5/8" Chips Cu.Yd.</u>	<u>1/4" Chips Cu.Yd.</u>	<u>3/4" Crushed Rock Cu.Yd.</u>
Stock at start of month	602	382	693	1,954	1,242
Made during month	0	0	1,010	0	0
Used during month	341	258	131	325	81
Stock at end of month	261	124	1,572	1,629	1,161

TELEPHONE SECTION  
MONTHLY REPORT FOR SEPTEMBER 1954

GENERAL

---

Authorization was received during the month from the A.E.C. for the installation and operation of Radiological radio telemetering equipment on two frequencies on an experimental basis.

Construction of the new Official Telephone exchange building, Project CA-533, was approximately 62% complete at 9-24-54. Scheduled percentage completion was 78%.

Installation of telephone distribution cables in the 100KW area by the Foothill Electric Company was completed during the month.

Invitations to bid on the printing of three editions of the Hanford Works telephone directory were supplied to potential bidders by the G.E. Contract Supervisor. Bids will be accepted on October 13th. Assuming no unusual delay in awarding the job, a new telephone directory should be available for distribution about November 20th.

Some items of equipment for the new Official Telephone exchange were received from the Stromberg-Carlson Company during the month.

During the month, leased-line operating practice was revised to permit "hold-over" and "try-again" service for callers who failed to reach desired party on first attempt.

No injuries of any classification were suffered by Telephone Section employees during September.

PLANT TELEPHONE OPERATIONS

---

Installed and placed in service a special eight-station conference circuit for the Separations Section in the 200W area.

Completed preventive maintenance work on the T-5 trunk cable between the 300 area and the 200EW exchange.

Began special preventive maintenance work on local distribution cables in the 100F and 200E areas.

Conferred with A.E.C. Engineering and Construction contractor personnel regarding electrical balance measurements on a new trunk cable to serve the 100K area.

At the request of the A.E.C., J. F. Lester inspected and made recommendations for rehabilitating some water damaged telephone equipment being installed in the 202A building, 200E area.

Reviewed remaining manufacturer drawings for the new Official exchange and furnished comment to the A.E.C. Engineering and Construction Division.

**DECLASSIFIED**



ABSENTEEISM

	<u>Exempt</u>	<u>Mandays</u>	<u>Non-Exempt</u>
Scheduled to Work	249		1336
<u>Manhours</u>			
Absent Due to Personal Illness	2		42.5
Absent for All Other Reasons	1		5.7
TOTAL ABSENCE	3		48.2
Percent Female Absenteeism	4.83%		
Percent Male Absenteeism	2.52%		
Percent Total Absenteeism	3.23%		

PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
General Unit	1	1
Radio Unit	1	3
Plant Telephone Unit	5	23
Commercial Telephone Unit	3	15
Business Office	1	5
Operations Unit	1	15
TOTAL	12	62
		74

W. J. Gire was removed from payroll on September 10, 1954 due to extended illness.

L. E. Wright and M. X. Pasch promoted from Non-exempt payroll to Exempt payroll effective September 20, 1954.

A. E. Howard removed from Exempt payroll to Non-exempt payroll on September 30, 1954.

R. C. Faller, Radio Electrician Trainee, terminated September 10, 1954.

STATISTICAL DATA

	<u>At 20th of September</u>	<u>Change From Previous Month</u>	<u>Change From Year Ago</u>
Residential Subscribers	6046	- 16	+ 369
Business Subscribers	490	+ 7	+ 3
Paystation Telephones	68	+ 1	+ 5
Official Subscribers:			
Richland Exchange	989	- 6	+ 13
North Richland Exchange	245	- 16	- 9
Process Area Exchanges	1803	- 9	+ 157

1215559

Jd-3

**DECLASSIFIED**

DECLASSIFIED

STATISTICAL DATA (Continued)

New Service Requests Received During the Month:

For Residential Service	129
For Business Service	12
TOTAL	<u>141</u>

Backlog of Service Requests:

For New Residential Telephones	251	TOTAL
For New Business Telephones	1	252
For Residential Outside Moves	30	
For Business Outside Moves	0	30

Service Orders Processed:

In Connection with Residential and Business Service	334
In Connection with Official Service	278
TOTAL	<u>612</u>

Facilities - Installed, In Service and Available:

	Exchange Lines			Party Lines Available
	<u>Installed</u>	<u>In Service</u>	<u>Available</u>	
Richland	4050	3986	64	369
North Richland	600	455	145	54
Process Areas	2050	1704	346	--
	<u>6700</u>	<u>6145</u>	<u>555</u>	<u>423</u>

Radio Stations:

	<u>At 20th of September</u>	<u>Change from Previous Month</u>	<u>Change from Year Ago</u>
Fixed Stations	35	0	+ 17
Mobile Stations	<u>150</u>	<u>+ 1</u>	<u>+ 8</u>
	185	+ 1	+ 35

*E. S. Staples*  
 Manager,  
 TELEPHONE SECTION

ES Staples:pab

October 4, 1954

ELECTRICAL UTILITY SECTIONMONTHLY REPORT

September, 1954

GENERAL

The Section's total work force of eighty-seven on September 1 had increased to eighty-nine at month's end by assignment of two replacement linemen.

## Plant Electrical Power Demand Statistics:

Probable Time of September Peak Demand....	11:00-11:30 a.m. September 21
Demand Peak for September. . . . .	116,000 KW
Comparative Metered Demand Peak in August.	115,326 KW
Billing Demand.....	116,767 KW
Date Billing Demand Est.....	May 28

Overtime hours instigated by Section needs were 1.9% of total hours worked.

The 200-E Area won the injury reduction award for the second consecutive month in August.

MAINTENANCE AND OPERATION

On September 3, 14, and 16, lightning disturbances on the EPA system caused surges on the HW System. On September 26, a switching operation at EPA's Columbia substation reflected a surge to the HW system. In no case did production loss result.

At approximately 10:53 a.m., September 15, power to one of the two 13.8 KV lines to 190-F and 105-F was interrupted momentarily. The interruption inadvertently occurred during planned switching operations set up to allow maintenance inspection and operational checks while the area was down.

Proof and preventive maintenance testing of high voltage cable with the newly received high potential DC tester was begun this month. The test data taken to date is indicative of the valuable results we can expect of this instrument.

During a series of planned outages to line sections of the 230-KV loop, carrier frequencies were retuned to allow for the added line sections to 100-K Area. Frequency spreads now ascend in a counter clock-wise pattern around the loop.

1215561

DECLASSIFIED

HW-33200- DEL

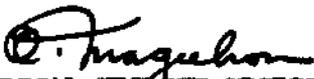
During one of these planned outages, Line No. 1 (Midway-100-B-C) was taken out of service and later returned to service because of abnormal voltage conditions in 100-B-C. During the period the line was out, loads had increased considerably in 100-B with a resultant drop in voltage at the 13.8 KV station bus to approximately 12.4 KV (10% under). In cooperation with the area maintenance group, surveys of voltage conditions at local facilities are under way. This is indicative of the added attention that must be given to regulation and the reduced system flexibility resulting from the increasing loop loads.

#### SYSTEM EXPANSION AND PLANNING

The forecasted test power requirements of 58,000 KW at 100-K for the latter part of the month did not materialize. The September peak demand was under 20,000 KW.

Current load studies in the 300 Area indicate the addition of large blocks of load above that now firm will require the installation of an additional primary transformer. Present demands are above the capacity of the normal rating of one transformer.

The weight of the CG-558 program as it will heavily affect the activity of this Section is becoming more apparent each day. Maintaining the continuity of power to production facilities during some phases of the construction period will require the utmost coordination between related groups.

  
ELECTRICAL UTILITY SECTION

O Mageehon:gf

1215562



DECLASSIFIED

PLANT AUXILIARY OPERATIONS DEPARTMENT  
OPERATIONS ANALYSIS SECTION

MONTHLY REPORT - SEPTEMBER, 1954

Personnel Statistics

Following is the month end summary of personnel:

Operations Analysis Section

<u>Unit</u>	<u>As of 8-31-54</u>			<u>As of 9-30-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
General	1	1	2	1	1	2	0	0	0
Applied Mathematics	19	4	23	19	4	23	0	0	0
Computing	6	43	49	6	42	48	0	-1	-1
Graphics	1	15	16	1	15	16	0	0	0
Procedures	12	3	15	12	3	15	0	0	0
<b>TOTAL</b>	<b>39</b>	<b>66</b>	<b>105</b>	<b>39</b>	<b>65</b>	<b>104</b>	<b>0</b>	<b>-1</b>	<b>-1</b>

Applied Mathematics Unit

	<u>As of 8-31-54</u>			<u>As of 9-30-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	2	3	1	2	3	0	0	0
Statistical Analysis	8	0	8	8	0	8	0	0	0
Mathematical Analysis	2	0	2	2	0	2	0	0	0
Numerical Analysis	8	2*	10	8	2*	10	0	0	0
<b>TOTAL</b>	<b>19</b>	<b>4</b>	<b>23</b>	<b>19</b>	<b>4</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>

\* One rotational trainee.

C. A. Bennett made a trip on September 8-19, which included attendance at the annual meetings of the American Statistical Association and the Institute of Mathematical Statistics in Montreal, Canada, consultation with the Management Consulting Services Division and Employee Relations Services Division in New York, and Project Bluenose meetings in Washington, D. C.

Computing Unit

	<u>As of 8-31-54</u>			<u>As of 9-30-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	0	1	1	0	1	0	0	0
Audit and Control	1	5	6	1	5	6	0	0	0
Key Punching	1	18	19	1	18	19	0	0	0
Machine Processing	3	20	23	3	19	22	0	-1	-1
<b>TOTAL</b>	<b>6</b>	<b>43</b>	<b>49</b>	<b>6</b>	<b>42</b>	<b>48</b>	<b>0</b>	<b>-1</b>	<b>-1</b>

One office machine operator and one tabulating machine operator were hired during the month and two tabulating machine operators terminated effective 9-17-54. One clerical working leader also terminated effective 9-24-54.

Graphics Unit

	<u>As of 8-31-54</u>			<u>As of 9-30-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	2	3	1	2	3	0	0	0
Illustrators	0	11	11	0	11	11	0	0	0
Graphic Designers	0	2	2	0	2	2	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>15</b>	<b>16</b>	<b>1</b>	<b>15</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>

One graphic illustrator terminated effective 9-3-54 and one graphic illustrator was hired as a replacement effective 9-27-54.

Procedures Unit

	<u>As of 8-31-54</u>			<u>As of 9-30-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	1	2	1	1	2	0	0	0
Clerical	0	2	2	0	2	2	0	0	0
Operations Analysts	11	0	11	11	0	11	0	0	0
<b>TOTAL</b>	<b>12</b>	<b>3</b>	<b>15</b>	<b>12</b>	<b>3</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>

DECLASSIFIED

DECLASSIFIED

HW-33200 DEL

FOR THE MANUFACTURING DEPARTMENT

A new mathematical model which will permit full optimization, as contrasted with sub-optimization in previous models, has been developed. This model is being fully discussed with Manufacturing Department personnel, and preparatory work for the computation has been started.

An experiment is being designed for K-pile in which information about any given tube will be kept current through utilization of IBM machines in the 700 Area. An investigation is currently being made of data pertaining to the single channel experiment in C-pile which is carefully monitored with regards to temperature and water flow. The purpose of this investigation is to determine how often temperatures and flows should be recorded in order to give adequate estimates of the power for any given tube.

A meeting of representatives from Dow Chemical Co., Process personnel from Hanford, and members of the Applied Mathematics Unit was held recently to discuss new specifications for our final product. The main point of the meeting was the AEC request that all sites manufacturing this product make routine statistical tolerance statements concerning the content of individual pieces of product. Because of an appreciable measurement variation inherent in the measurement methods used to measure content, existing statistical techniques will require revision to be applicable to this situation.

These revisions are currently being investigated by personnel of the Applied Mathematics Unit. When they have been made, it will also be necessary to make recommendations concerning the best way to collect data to allow the necessary estimates to be obtained in the most economical manner.

Personnel of the Applied Mathematics Unit have been working closely with personnel of the Analytical Control Sub-Section of the Separations Section to establish a method of control over the chemical laboratories which requires a minimum amount of duplicate work. In connection with this problem, a system of continuous sampling inspection has been recommended which would guarantee a given average quality on reported results. (Letter: "Proposed Method of Laboratory Control," to D. F. Shepard).

Work is continuing on the study of the variation in canning bath temperatures for the Canning Unit of the Metal Preparation Section. The purpose of the study is to determine if excessive variation is occurring in the calibration or reading of the thermocouples used for either the recording instruments or the standard test units. This problem is important since an increased number of canned assemblies have been rejected because the temperature of the canning bath was not within specifications.

Based on past experience, tolerance limits were calculated for the per cent rejects in various reject classifications in the canning process. These limits were reported verbally to a member of the Process Improvement Unit of the Metal Preparation Section. The purpose of the limits is to relieve this group of writing explanation of reject causes when the reject rates are within an expected range of values. To assist in maintaining control of warp in slugs, the sampling size

necessary to detect changes of specified magnitudes at a given level of confidence was also calculated. (Official Use Only Letter: "Sampling for Warp Determinations," To R. E. Olson). Due to the small amount of data upon which these estimates were based, it was recommended that a close check be kept on the first groups of additional data and a re-evaluation made if necessary.

Work is being done on the problem of nondestructive testing of enriched slugs to determine uranium content. Possible sources of variation are being considered and before the next shipment of slugs is received the precision of the measurements will be ascertained and a sampling procedure will be outlined. This work is also being done at the request of the Process Improvement Unit.

At the request of the Instrument and Electrical Unit of the Metal Preparation Section, a mathematical evaluation of a suggestion which proposed a new procedure for calibrating counter tubes was given. (Letter: "Comparing Two Methods of Introducing Radioactive Source for Tube Calibration," to W. A. Shanks)

Routine computational work for the Manufacturing Department consisted of panellit gauge reports for D-reactor, B-reactor, C-reactor, and F-reactor. Considerable activity was experienced in processing data from C and F-reactors, in view of the fact that an extensive recalibration of gauges on these piles has recently been completed. An additional analysis of D-reactor operating data was also made, in preparation for the forthcoming reorificing of this reactor.

Graphics work prepared for representatives of the Manufacturing Department to use as presentation material to General Electric Company officials on their recent visit included the following: Layout and rendering of a large 30 x 120 inch colored flow sheet showing the complete step by step process of metal preparation; layout and rendering in color illustrated visual aids of (1) bare slug quality, (2) aluminum cap and can, (3) canning bath control, (4) cap finishing and (5) finished slug; perspective projection and rendering a cut-a-way illustration of the 105-C Building.

Additional graphics services for the Manufacturing Department included preparation of organization charts of the Separations Section and the Redox Sub-Section; arrangements and inspection in moving the 105-K model to and from the 100 Areas; posting and issuance of various control charts; preparation of a series of lecture charts to be used by the Separations Section in making contamination control studies.

#### FOR THE ENGINEERING DEPARTMENT

A report has been issued (HW-32687: "Reactor Fuel Elements") giving test procedures for comparing two types of metal for failure performance in a reactor. These recommendations were based on the results of a study of the statistical distribution theory underlying fuel element failure data. Some further work has been completed on various aspects of this distribution theory in an attempt to provide objective answers to certain questions that have arisen subsequent to the issuance of the report. Work is beginning on phase two of the over-all program, namely, the compilation of past failure data for purposes of statistical analyses.

A request has been received from the Uranium Quality Group for an analysis of certain production tests. The analysis will be made to determine the performance of various types of metal. Data for the analysis will be obtained from the 100 Area Production Scheduling operation, and will be processed to yield such quantities as individual type powers.

DECLASSIFIED

HW-33200 UEL

Analysis of slug length changes due to irradiation of 6M and 7M material was completed. The changes or trends were grouped by tubes, by pile, and by tube exposure. This study was done at the request of the Fuel Element Development Unit. (Secret Document: HW-33052: "Dimensional Changes of 6M and 7M Metal," to W. T. Kattner)

The necessary sample sizes to obtain a certain level of confidence in statements of physical changes of slugs due to irradiation were obtained from the Fuel Evaluation Unit of the Pile Technology Sub-Section. Data from production test 10M will be used as a preliminary study preceding the 105-C program which will have its startup in the not too distant future. Recommended sample sizes, based upon the variation of 6M and 7M length changes, were reported verbally to members of the group.

A member of the Pile Coolants Effects Function of the Applied Research Sub-Section developed an equation, based on theoretical considerations relating corrosion rates to surface temperatures. This equation was an infinite series in which one of the parameters to be estimated was one term in the denominator of a fractional exponent, appearing differently in each term of the series. Some experimental corrosion data were available from which the parameters were estimated using one, two, and three terms of the series respectively. This was done in order to determine whether or not the theoretical curve provided an adequate fit to begin with, and, if so, to determine how many terms in the converging series needed to be included. The calculations were carried out on IBM equipment by iterative methods involving some 600 solutions. The results of the analysis were reported orally.

The analysis of corrosion data from PT-519 has been completed. This analysis demonstrated that time of exposure does significantly affect corrosion rate. It also firmed up the parameter estimates previously given (HW-31497: "A Basis for the Corrosion Limit to Pile Operation" by S. Goldsmith) and gave confidence intervals for each of the estimates. Due to the significant time effect, two sets of estimates were given, one holding for "short" exposure times and one applying to "long" exposure times. A further breakdown of time could not be made at this point because of lack of sufficient data. In the future, it is hoped that enough additional data gathered under the same conditions as PT-519 data will be available such that the variable time can be worked into the equation. This would result in one equation expressing corrosion rate as a function of slug power, slug surface temperature, and time of exposure. (Secret Rough Draft: "Production Test 519," to S. Goldsmith)

An experiment to study the static corrosion of steel was designed for the Metallurgy Unit of the Applied Research Sub-Section. It was desired to determine the effects of 768 treatment combinations, but due to the expense and time involved a one-quarter replicate consisting of 192 treatment combinations to determine the effects of corrosion on four steel alloys in solutions of varying concentrations of nitric acid and chloride ion maintained at four different temperatures for various lengths of time was set up. (Secret Rough Draft: "Proposed Factorial Redesign for Static Corrosion Tests, C-172, Including Time Effects," to N. D. Groves)

Additional curve-fitting was performed in connection with the attempt to estimate lattice parameters from buckling measurements in the exponential pile. The combined data from buckling measurements on wet and dry lattices was analyzed again, using two different values for the cross section of water. Some quantities treated as known constants in the formulation of the problem are actually variables in the sense that some question exists as to their exact values. These quantities have been altered slightly in order to determine their effect on the resulting estimates of the parameters. Two further changes in the computational scheme have been requested. One involves using a more accurate expression to determine the theoretical buckling. This expression is transcendental, as in being solved by an iterative scheme. The second change consists of using a more accurate expression for the diffusion length of the cell. These changes will be made independently in order that the effect of each can be compared with earlier results.

Work has been started on the computation of saturated activities of foils in connection with a shielding experiment. In this experiment, gold foils and sulfur disks are placed in cadmium containers and inserted at various position in the pile shield. After a certain exposure period and "cooling" period, the foils are counted three times. From these counts and other pertinent information, the saturated activity of the foil is calculated. The flux at any point in the shield can then be inferred directly from the saturated activities. The main difficulty encountered in programming this problem for machine calculation has been the large amount of data associated with each measurement. This difficulty was successfully overcome by using the Card-Programmed-Calculator. A very similar type of analysis, requested by the Exponential Pile Group in connection with their foil experiments, is presently being run on a routine basis. By making provision for a variable number of observations for each position in the pile, the running time for this calculation has been reduced considerably.

Computational work on a new series of experiments in pressure and water quality variation in a process tube has been started. The problem is identical in form to those undertaken previously, and full utilization was made of the techniques developed for treating problems of this type. Twenty sets of data were submitted, and eight have been completed at this time. The same difficulty encountered in previous calculations has appeared again; in spite of close agreement between experimental and calculated values of water quality, the calculated pressure drops are considerably smaller than the experimental pressure drops. Further work will be done after some study of the present results.

Additional computational work was done on the problem of critical flow in a process tube. Two revisions of the original program were made in order to obtain more accurate results. With these modifications, some six additional cases were run.

Numerical work on the thermal utilization of a hollow slug has been started again. The present lattice model differs somewhat from those studied earlier, in that provision is made for two aluminum liners--one separating the core and the uranium, the other separating the uranium and the graphite. In addition to the thermal utilization, the resonance utilization, resonance escape probability, and migration area are being calculated. Parameters allowed to vary are the radii of the core, uranium, and cell, and various cross sections. The calculations will be done for both water-filled and air-filled cores.

DECLASSIFIED

HW-33200

DEL

A variation of the problem of heavy isotope buildup in a uranium-coated thorium slug operating at a constant power level has been undertaken. The new slug model consists of a uniform mixture of thorium and enriched uranium. The new model necessitates certain changes in the computational scheme, although the quantities to be calculated will be the same as before.

Considerable experience has been gained in the past year on the problem of the numerical correction of X-ray line graphs. The mathematical techniques employed, which include the calculation of Fourier coefficients from empirical data and the solution of particular types of integral equations, have been modified and sharpened during this time. A document is now being prepared which presents the basic theory as it now stands. It is intended to submit this document for publication in a technical journal.

Further studies are being made on the integral equation for the transport of neutrons, with special attention to problems involving spherical and cylindrical symmetry. Attempts are being made to apply the so-called principles of invariance developed by the astrophysicists Ambarzumian and Chandrasekhar.

Curve fits for five of the  $K_{\infty}$  functions have been obtained. These curve will be used in computing multiple collision densities, quantities of fundamental importance in the advanced study of neutron diffusion. Considerable difficulty was encountered in obtaining the curve fits, due to the extreme curvature of the functions. The form finally chosen was a rational one containing a twelfth-order polynomial. In order to obtain the coefficients of the polynomials, it was necessary to solve a number of  $12 \times 12$  systems of linear equations. Work is presently being done on a hand calculation of the second collision density function. This is being done to test the feasibility of the computational methods, and to make available as early as possible a limited number of results.

The vendors who are currently manufacturing expendable dummies for General Electric at Hanford are encountering a great deal of trouble in maintaining a quality level on the critical defect of burrs which will allow a reasonable percentage of submitted lots to be accepted under the statistical sampling plan currently being used. When the present sampling plan was set up it was requested by personnel in Inspection and Materials Unit of the Project Auxiliaries Sub-Section that it be so designed that on the average the lots finally accepted would contain not more than one burr per hundred dummies. The question has been raised as to whether one burr per hundred dummies is a reasonable quantity level to require for incoming material. To estimate the quality of dummies accepted and used prior to the inauguration of the statistical sampling plan, samples were drawn from lots accepted under the methods of inspection used before the installation of the statistical sampling plan. The results of these samples indicate that this older material averaged approximately one burr per four dummies. This information has been forwarded to the people responsible for making the decision concerning the quality required for dummies accepted by General Electric. Once a final decision has been made about the desired quality, it will then be possible, if necessary, to modify the existing sampling plan to insure that the material accepted will, on the average, be of that quality or better.

Data on the number of security violations per month in the four main organizational components of the Engineering Department were analyzed statistically at the request of the Engineering Administration Sub-Section. The purpose of the analysis was to obtain control limits for the number of security violations per month, so that significant increases can be detected. Separate limits were constructed for each group, since the analysis pointed out that differences exist among them with respect to the number of violations per employee (considering only those who have access to files). Limits were constructed for both open file violations and open file violations plus improper storage.

The analysis of data on contamination of the area surrounding the Redox stack has been completed for the Separations Design & Development Unit. The data consist of readings taken during the past seven months at the one hundred stations or control plots located at specific distances within a radius of twelve thousand feet from the stack. The maximum millirad reading of particles located within a control plot at the time of survey was recorded, most control plots being surveyed at least once a week. As a result of the analysis, control charts were constructed which would detect major shifts in the magnitude of the particles emitted. One was based on a major control group of plots located close to the stack and the other two were based on groups of stations further out from the stack. (Letter: "Analysis of Data on Redox Environs Contamination," to E. Deud)

Routine computational work for the Engineering Department consisted of Group Nine Metal Studies calculation on data for June, July, and August; Special Request Exposure calculations for August and September; and Bluenose calculations. Certain discrepancies in the data recorded by the two independent systems in the two systems might have been inadvertently interchanged. However, an investigation showed this not to be the case.

The cycle inventory for classified documents has been started on the second cycle. The number of copies held by individuals has been reduced 11% to 66,837 copies since the routings were converted to machine processing. During the same period the routings have increased by about 20%. This decrease in holdings and increase in routings tends to give a better security control as the documents are actually handled by the control unit at more frequent intervals. The handling cost of a complete transaction is approximately the same as the cost per copy held in inventory. Since the number of copies held has decreased more than the transactions have increased, the cost of the daily machine processing is tending to decrease.

Classified Files was provided with data regarding the number of copies of classified documents held by individuals at Hanford Atomic Products Operation and the number in the vaults. For the first time these figures were based on actual counts of the records.

Graphics continued work in the development of detailed perspective cut-a-way illustrations for both the Purex equipment and the 100-C Examination Facility equipment assignments. Four of the Purex equipment illustrations completed will be photographically enlarged and utilized in the coming project review. Two perspective illustrations of the 100-K Area were rendered in air brush technique for Engineering management.

Additional services for the Engineering Department included preparation of a flow diagram on "Fission Waste"; three schedule and force status charts for "FY 1954 Water Tank Replacements"; one chart for document HW-32843 titled "Spectrochemical

**DECLASSIFIED**

HW-33200 **DEL**

Determination of Uranium Isotopes"; photo copy and paste-up for five figures to be used in document HW-31938 titled "Horizontal Rod Skin Temperature Determination Report"; forty-One pages of charts and graphs for document HW-32236 titled "Quarterly Progress Report"; a perspective cut-a-way of the Purex process cells showing equipment and architectural features; general revisions to approximately twenty plates for document HW-29548 titled "Special Irradiation"; and preparation of a cost estimate and construction schedule for the building of a model of the 1706-KE and KW Buildings.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

An interim manual inventory control procedure is being considered to achieve maximum benefits while awaiting the possibility of a mechanically-assisted procedure. A number of mathematical models are being studied. Most models given consideration appear, by virtue of their comprehensiveness, to be too cumbersome and involved for use at present in a manual system. However, one base-stock model and one order-cycle model seem to be sufficiently simple and yet sufficiently realistic to provide a profitable guide until the installation of a mechanically-assisted procedure makes possible the use of a more precise and comprehensive model. These models will be presented in Progress Report 4 which is forthcoming. Further systems investigation will be necessary to determine the feasibility of implementing these models.

A method was devised for the punching and processing of a IBM card with a "floating decimal" field. When using this method the field in the card is punched with the first significant digit in the first column of the field. This eliminates the necessity for punching zeros in the field preceding the significant numbers in order to fill the field (i.e., a field established for a maximum of eight digits would normally have the number 23 punched as 00000023. Under the floating decimal method it would be punched as 23 ----- with the last six position being blank.) The advantage of this method is the elimination of key strokes (in the example, 8 key strokes as compared to 2) and also the elimination of the time required by the key punch operator to determine the number of zeros needed at the beginning of the field. It is estimated that the use of this method for the processing of the General Supplies physical inventory saved \$400.00.

A discussion was held with personnel from the Plant Protection Section, the AEC Property Branch and the Purchasing and Stores Section relative to a system of maintaining a perpetual inventory of the excessed office machines in surplus stores. An original inventory for this purpose was produced from the cards of machines which have been excessed to date. This listing was checked with machines in surplus stores is to be produced as a by-product of routine monthly office machine reports. The Purchasing and Stores Section is to provide monthly advice of machines removed from the plant.

The IBM equipment was again used to facilitate and control the selection, purchase and distribution of safety awards. The previous procedure was revised to allow for the use of the selection card for the employees certificate of receipt.

At the request of the Manager of the Plant Protection Section, a study is being made of the area fire protection system. The purpose of the study is to determine the optimum operating methods to make the system as efficient as possible.

Data is being accumulated for the Transportation study. The data currently being analyzed is the pattern of vehicle operation from the 700 Area Motor Pool, assigned vehicles, and the 1100 Area parking lot. The information is being obtained from a sample of trip tickets (7,600 tickets) and vehicle time cards (1400 cards).

A study is being made on the possibility of establishing clerical standards. The first step is a survey of the literature available on what other companies have done or are doing on this problem.

A study was made to determine if a warehousing operation for stainless steel would lower purchasing costs. The warehousing operation considered was a corrosion test. An analysis revealed that due to the diversity of sizes and the low turnover rate it is not feasible to perform the warehousing operation at Hanford Atomic Products Operation. The sample did reveal that 86% of the stainless steel was of a type that can be tested by the vendor with no charge to the customer. It was recommended that the vendors be encouraged to perform the test (oxalic acid test) on material before shipment.

Graphics work for the Plant Auxiliary Operations Department included printing of one hundred and fifty-two name plates on the new embosograph machine; preparation of a master reproduction for "Railroad Dispatcher Train Sheet" forms; hand lettering of certificates for the Fire Protection Unit.

#### FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

Relationships between the distance across the Columbia River, velocity of flow, and total flow have been statistically determined in order to use these results in estimating the dilution of pile effluent downriver from Hanford.

A request has been received to estimate the cost of reducing data from the proposed wind turbulence experiments. In these experiments, it is anticipated that some 1200 observations of three variables will be made every minute. The analysis calls for the computation of "running averages" of these observations over varying time increment. The problem is clearly in the large-scale computer class, and cost estimates will be based on the assumption that the analysis will be carried out on such a machine.

The activity densities of Columbia River water and river organisms from Hanford to McNary Dam have been sampled since 1948. The data were analyzed for the Aquatic Biology Unit to determine if there were any significant increases in the activity densities of river water and organisms. (Secret Rough Draft: "River Organism Activity Densities," to J. J. Davis)

**DECLASSIFIED**

DECLASSIFIED

HW-33200 DEL

In connection with an experiment by the Aquatic Biology Unit to determine the effect of varying concentrations of pile effluent on various Columbia River organisms, the number of organisms of each species required is being determined in order that there will be a high probability of being able to distinguish a difference in the mortality rate of organisms under normal conditions and when exposed to varying concentrations of pile effluent.

Routine computational work for the Radiological Sciences Department consisted of Weather Studies calculations for June, July, and August; Wind Station analysis for May, June, and July; Sheep thyroid and radioanalysis calculations; and Aquatic Biology calculations. A new procedure for processing wind station data has been put into effect. The savings realized by the new procedure are considerable, the running time being reduced by 65%, and card volume reduced by 80%. An extensive summary of wind data for 1952-1953 was also made. The results were listed in a form suitable for reproduction.

Graphics work for the Radiological Sciences Department included preparation of material for slide presentation on micromatic devices, wiring diagrams and parts arrangement. Other work involved layout and rendering of fifteen figures for document HW-31781 and preparation of fifty-three pages of photo copy for document HW-32506 titled "Columbia River Survey 1951-1952-1953".

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

A study of position analysis factors was completed for the Salary and Wage Administration Section. From ratings of position analysis blanks, inter-relationships between the various portions of the analyses were investigated separately for four organizational groups. It was observed that the ratings of some organizational groups differed from the others with regard to their correlations and averages. The results and suggested possible reasons for the differences were presented to a member of the section.

A special analysis was made by use of IBM records to obtain the following plant force averages:

	<u>Female</u>	<u>Male</u>	<u>Total</u>
Average years of age	35.0	39.2	38.4
Average years of service	4.1	7.1	6.5

For the Hospital a study is being conducted of the in-patient admission procedure. For each admission approximately 15 different forms must be initiated ( e.g., History Record, Orders for Treatment, Nurses Record, Patients Graphic Chart, Admission Record, Patients Ledger Card, Invoice or Statement, etc.) Some forms are now being prepared or initiated at the time the patient is admitted while others are prepared at various times as required. The objective of the study is to initiate all forms with one writing - preferably in the admitting office using clerical personnel rather than by professional personnel. Experiments are currently being conducted using the Spirit Duplicating Process for recording the duplicate information on the various forms.

FOR THE FINANCIAL DEPARTMENT

The final phase of the revision plan for the IBM Weekly Payroll system was placed in operation with the checks issued on September 17. The time card was revised in April of this year to make additional statistics directly available. The most recent changes affected the latter portions of the machine operation. Deposit slips are now issued to banks instead of checks and employees who use this direct deposit service now have the notice of deposit incorporated on their earnings and deduction statement. Adjustments to gross earnings are explained on the earnings statements and the Weekly Salary Roll. Continuous earnings statement and check forms are printed on the new, higher speed, type 407, accounting machines. Vacation and voucher (recording of manually prepared checks) procedures have been simplified and re-designed to conform more closely to manual payroll operations. Only very minor troubles were encountered during the conversion. Considerable gain in general accuracy and some increase in speed was experienced during the first two weeks of operation. A complete set of IBM operating procedures was prepared in advance of the change and procedural staff assisted with the first run of the new system.

A revised system of work order cost reporting is being developed. This system was scheduled for installation on November 1st but the recently announced organizational change may necessitate postponement of this change for another month. This revised system will reduce IBM processing effort by one-third through the summarization of data.

An IBM control file for exempt payroll insurance deductions was established. This file will be listed monthly for use in preparing the exempt payroll and will establish insurance control totals.

A study is being made of Project Proposals at the request of the Financial Department. This study is to include the required procedures connected with the preparation, approval prior to submission to the AEC, and assignment of management responsibility after AEC approval. Project Proposals issued during a twelve month period are being studied in detail to determine the time factors and paper handling involved.

Work continued during September on the development of a machine system for the development of property records for Plant Accounting. A proposal is being prepared for the method and means of making the conversion.

Procedures were prepared for the use of IBM equipment in the processing of Stores physical inventories. The processing includes putting the inventory tags in numerical sequence, listing the missing tags, computing the value for each tag, and the compilation of the value for each caption. The first inventory processed was for the General Supplies. For this inventory 42,000 inventory tags were used. These tags were received by Computing at 5:00 P.M. They were sorted to tag number sequence and the missing tag numbers were listed. The listing and tags were returned to Stores by 6:00 A.M. the following morning. The tags were posted by Central Stores personnel and returned to Computing where the quantity and price were punched into the tags. They were then extended to compute the value for each tag, placed in tag sequence within each

DECLASSIFIED

HW-33200 [ ]

caption and tabulated by caption. The processing by IBM equipment eliminated the necessity for considerable overtime by Stores personnel. It also made possible the listing of each inventory tag.

A table of predicted Pu buildup and Uranium depletion based on relationships recently recommended by personnel of the Technical Section of the Engineering Department has been calculated on the card-programmed-calculator and submitted to the SF Accountability Section. (HW-33180, "Table of Plutonium Buildup and Uranium Depletion," to C. J. Shortess, Jr.)

Preliminary work on calibration curves for Redox tanks H-7 and E-12 has been completed. However, a meeting with the people who did the original water calibration work will be necessary before calibration tables for these two tanks can be completed.

Graphics work for the Financial Department included the posting of current data and publishing the monthly HAPO Cost Report; preparation of two charts on Operating Cost and Budget and Research and Development Cost and Budget; completion of a "Spare Parts" chart.

FOR THE ATOMIC ENERGY COMMISSION

In connection with the Bluenose project, the ratios by months of the "F" factor used during that month to the "F" factor based on the most recent isotopic buildup relationships were determined back to startup. These ratios will be used to revise release figures.

[ ]  
-Jf-14-

1215576

**RECEIVED**

OCT 26 1954

700 AREA  
CLASSIFIED FILES



1215577