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HANFORD 56142

MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

JULY 1954

Classification Cancelled (Change To Declassified with Deletions
by Authority of CG-PR-2
DS Lewis 5/21/92
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Compiled By
DEPARTMENT MANAGERS

August 20, 1954

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RICHLAND, WASHINGTON

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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

JULY 1954

GENERAL SUMMARY

Production Operations

In the Metal Preparations Section production of normal material for the month was 91 percent of forecast. The overall canning yield for July was 80.6 percent.

The total reactor input plutonium production was 106 percent of the official forecast and exceeded that of the previous record month of last January by 2.6 percent. The output production was 125 percent of the forecast. A total of three regular uranium ruptures occurred during the month. In addition, six "J" slugs and one "E" slug failed.

Redox production for the month was 144 percent of the official forecast. T Plant production was 114 percent of forecast. TBP production was 122 percent of the official forecast. UO_3 production was 105 percent of forecast. All commitments for 234-5 production were met.

Engineering Technology

Project CA-513, Purex Tank Farm condenser revisions, continued on a priority basis. Design was advanced to 90 percent completion. Total design for Project CG-558, Reactor Plant Modification for Increased Production, advanced to 26 percent.

Hanford 4-X Program objectives and general plant requirements were received from the Atomic Energy Commission on June 23, 1954. A Preliminary Project Proposal requesting authorization of $800,000 for the initiation of design and procurement was prepared and transmitted to the Commission on July 19, 1954. Authorization of Project CG-597, 200-300 Areas, in the amount of $100,000 was received from the AEC late in the month.

Work was begun on establishing a technical basis for a dual-purpose reactor capable of producing 400,000 kw of electrical power to be used as a primary example of reactor plant economies for the Special Study. Also these studies will be used to evaluate the technical and economic comparisons between small and large scale reactor plants.

Sixteen informal, six Class I and two Class II radiation incidents were recorded.

Personnel and Services

There were no major injuries recorded during the month of July. There were 310 minor injuries during the month, as compared with 284 in June.

The employee separation rate decreased from 1.19 percent for June to .67 percent for July.

Formal agreements with the Hanford Atomic Metal Trades Council were executed on July 19, which action concluded 1954 contract negotiations with the three principal collective bargaining units at HAPO. A determination regarding the status of the contract for the one remaining unit (Community Firemen) is anticipated in the near future.

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Atomic Energy Commission
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For: B. M. Fry, AEC, Washington

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STAFF

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. . . . . H. M. Parker

. . . . . A. B. Greninger

. . . . . J. E. Maider

. . . . . H. D. Middel

HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
JULY 31, 1954

	EXEMPT		OTHER		TOTAL	
	7-31-54	6-30-54	7-31-54	6-30-54	7-31-54	6-30-54
Engineering Department						
General	19	19	81	77	100	96
Design	173	171	126	130	299	301
Project	269	272	154	155	423	427
Technical Section						
General	10	10	3	3	13	13
Applied Research	121	120	51	54	172	174
Separations Technology	114	116	44	40	158	156
Pile Technology	107	106	67	66	174	172
Fuel Technology	69	72	79	73	148	145
Advance Technology	11	11	1	1	12	12
Manufacturing Department						
General	15	15	7	7	22	22
Reactor	272	273	1 178	1 156	1 450	1 429
Separations	284	285	1 248	1 248	1 532	1 533
Metal Preparation	98	98	479	461	577	559
Plant Auxiliary Operations Department						
General	1	1	1	1	2	2
Elec. Dist. & Telephone	28	30	136	137	164	167
Transportation	44	44	450	447	494	491
Purchasing & Stores	56	56	238	235	294	291
Plant Protection						
General	1	1	1	1	2	2
Patrol & Security	59	59	433	439	492	498
Safety & Fire	30	30	106	106	136	136
Office Services	13	13	198	197	211	210
Administration Main Service	12	12	88	86	100	98
Operations Analysis	38	38	64	65	102	103
Financial Department						
Financial General	6	6	7	8	13	14
Costs & Budgets	27	27	101	98	128	125
General & Personnel Accounting	18	18	114	113	132	131
Property Accounting	16	16	41	41	57	57
Audits & Procedures	18	18	4	4	22	22
SF Accountability	6	6	21	20	27	26
Employee & Public Relations Dept.						
Community Oper.	69	67	185	184	254	251
Real Estate Services	20	22	161	158	181	180
Health & Safety	54	54	209	211	263	265
Management	6	7	2	2	8	9
Salary & Wage Admin. Sec.	10	5	10	6	20	11
Personnel Practices	11	20	35	39	46	59
Employee Communication & Pub. Rel.	8	4	27	21	35	25
Union Relations Section	3	8	2	7	5	15
Education & Training Section						
Staff	8	4	5	6	13	10
Others	-	-	71	72	71	72

	EXEMPT		OTHER		TOTAL	
	7-31-54	6-30-54	7-31-54	6-30-54	7-31-54	6-30-54
Radiological Sciences Department						
General	3	3	5	3	8	6
Records & Standards	26	27	138	142	164	169
Biophysics	59	58	60	60	119	118
Biology	33	33	38	39	71	72
Engineering	6	6	1	1	7	7
Legal	3	3	2	2	5	5
Special Study	3	3	2	2	5	5
Total	2 257	2 267	6 474	6 424	8 731	8 691

AREA PERSONNEL DISTRIBUTION
JULY 31, 1954

	100-B AREA	100-D AREA	100-F AREA	100-H AREA	100-K AREA	101 AREA	200-E AREA	200-W AREA	300 AREA	700-1100-3000 AREA AND PLANT GENERAL	TOTAL
Engineering Department											
Exempt	23	76	-	10	47	-	68	51	287	331	893
Other	17	32	2	53	16	-	14	26	217	229	606
Total	40	108	2	63	63	-	82	77	504	560	1 499
Manufacturing Department											
Exempt	71	58	64	73	16	-	8	257	98	24	669
Other	335	327	287	222	28	-	133	1 088	479	13	2 912
Total	406	385	351	295	44	-	141	1 345	577	37	3 581
Plant Auxiliary Operations											
Exempt	26	7	7	7	7	-	11	17	11	189	282
Other	53	48	81	57	71	11	63	163	105	1 063	1 715
Total	79	55	88	64	78	11	74	180	116	1 252	1 997
Financial Department											
Exempt	-	-	-	1	-	-	1	2	6	81	91
Other	-	-	2	2	-	-	2	1	17	264	288
Total	-	-	2	3	-	-	3	3	23	345	379
Employee & Public Relations											
Exempt	-	2	-	1	-	-	4	2	2	178	189
Other	4	12	13	3	1	-	4	9	28	633	707
Total	4	14	13	4	1	-	8	11	30	811	896
Radiological Sciences											
Exempt	2	-	34	-	-	-	2	17	61	11	127
Other	9	-	41	-	-	-	6	16	152	18	242
Total	11	-	75	-	-	-	8	33	213	29	369
General											
Exempt	-	-	-	-	-	-	-	-	-	6	6
Other	-	-	-	-	-	-	-	-	-	4	4
Total	-	-	-	-	-	-	-	-	-	10	10
Total Exempt	122	143	105	92	70	-	94	346	465	820	2 257
Total Other	418	419	426	337	116	11	222	1 303	998	2 224	6 474
GRAND TOTAL	540	562	531	429	186	11	316	1 649	1 463	3 044	8 731

MANUFACTURING DEPARTMENT

JULY, 1954

METAL PREPARATION SECTION

The net production of acceptable slugs in July was 267 tons which was 91 percent of the official forecast. The canned slug production was below forecast as a result of insufficient metal receipts to maintain an adequate bare slug inventory. The canning of four-inch slugs on a production basis was completed during the month when the final eight tons of four-inch material was processed with a canning yield of 62.3 percent. The canning yield for the eight-inch slugs was 81.3 percent, making the overall canning yield for both sizes 80.6 percent.

A total of 4086 acceptable thorium slugs was canned with a canning yield of 57 percent. The low yield resulted from die sizing cans on small diameter bare pieces.

Approximately 440 enriched aluminum alloy slugs were canned by the hot press method to evaluate canning and cleaning techniques in preparation for the hot press canning of a large number of this type of slug to be used in the irradiation program. Preliminary results indicate a canning yield of over 90 percent may have been realized; however, final inspection has not been completed.

Results of production tests have indicated the possibility that slugs heat treated in slug form rather than rod form might be superior insofar as in-pile performance is concerned. Consequently the decision was made to heat treat part of the regular slug production in slug form, and a request has been forwarded to have Fernald ship approximately 40 percent of all slugs to Hanford as unheat-treated material. It is planned to heat treat these slugs at Hanford prior to canning.

There were two autoclave failures during the month, one a regular eight-inch uranium slug and the other a dry canned thorium slug.

REACTOR SECTION

The total input plutonium production was 106 percent of the official forecast and exceeded that of the previous record month of last January by 2.6 percent. The output production was 125 percent of the forecast. The input production was achieved despite increased river water temperatures, which resulted in slightly lower maximum power levels than were attained in June. An improved time operating efficiency of 87.1 percent, as compared to 86.6 percent in June, contributed primarily to the record production.

The discharge of the low and high concentration material was 150 and 115 tons respectively. The output of high concentration plutonium was greater than forecast due to the continued discharge of material at the C Reactor in order to complete the conversion of this unit to a program of low concentration production. Of the total 265 tons discharged in July, 40 percent was discharged at the C Reactor.

REACTOR SECTION (Continued)

Because of the reduced rupture rate experienced at the five old reactors during June, the average goal exposure for high concentration material was raised eight percent to gain increased utilization of metal. The low concentration material average exposure was reduced approximately 12 percent as a result of certain qualitative analyses of product performed during the month.

Eighteen reactor scrams occurred during the month. Of these, seventeen were caused by normal Panellit system difficulties at all reactors, and one scram at H Reactor was caused by a low pressure Panellit trip resulting from a Building 190-H pump turbine governor bearing failure. Total outage time charged to these scrams was 4.9 hours. While the number of scrams resulting from normal Panellit difficulties remains about the same as in recent months, this performance represents considerable improvement with regard to scrams resulting from other instrumentation difficulties.

Horizontal rod work continued to decrease in July as compared to recent months. It was necessary to remove only one rod from service, No. B at H Reactor, when a leak test of all horizontal rods at this reactor revealed leaks in both the rod and the thimble. Rod maintenance work was confined to F Reactor where No. A rod was installed and returned to service, and where several additional graphite blocks were removed from No. 8 rod channel preparatory to installation of a half-rod of the new design.

Three process tube leak testing programs, two at C Reactor and one at B Reactor, amounted to approximately 10, 50, and 25 hours of outage time respectively. At C Reactor, after testing approximately 240 tubes, tube 1794-C was found to be leaking. Later in the month, because of continued high water collection rates, approximately 720 additional tubes were tested without locating another leak. At month end water collection rates remained above normal, indicating the possibility of continued leakage into the reactor. At B Reactor, testing of approximately 660 tubes revealed six corroded Van Stone flange leaks. These tubes were either replaced or blanked off.

A total of three regular uranium ruptures, one four-inch and two eight-inch, occurred during the month. In addition, six J slugs ruptured at the DR Reactor and one E (cored enriched uranium) slug at the C Reactor. The total outage time resulting from the ten ruptures was 175 hours.

Tritium input production at C and DR Reactors was 106.3 percent of forecast because of a higher than forecast time operated efficiency of 89.6 percent at DR Reactor. The overall program continued to decrease as first loading J-N tubes were replaced with regular uranium. Remaining are 917 J-N tubes of the second loading at DR Reactor, and 110 J-N tubes at C Reactor. Input production consigned to the tritium program was 52.3 and 3.7 percent at DR and C Reactors respectively.

The experimental 13 tube thorium irradiation program at H Reactor continued without incident.

SEPARATIONS SECTION

The Redox production for the month was 144 percent of the official forecast. The T Plant production of low g/t product was 114 percent of the forecast.

SEPARATIONS SECTION (Continued)

At the beginning of the month a few jumpers remained to be installed on the Redox Phase II capacity increase project and the oxidizer off-gas treatment installation. In addition to these items, the stack flush and the installation of the new oxidizer tower and pot remained to be done. On July 2, the flushing of the stack was completed. Samples taken during the flushing indicated that about two and one-half curies of active particles, principally ruthenium, were removed from the stack and breeching. The new oxidizer installation was started on July 3 and completed on July 11. At first it was found that the ribbing on the bottom of the pot prevented proper seating on the "Y" foundation pad. Shims were placed on the pad studs to gain the necessary clearance, and 13 new jumpers were fabricated and four remodeled to fit the repositioned pot and tower. The facility downtime in July was 427 hours for the completion of all the work.

The dissolving of metal and preparation for head end treatment was started on July 15. On July 18 the columns were started at a 5 tons per day rate with increases to 7 tons per day on July 24 and to 7.5 tons per day on July 27. The first several batches of salt waste had to be reworked because of high plutonium content. Subsequent plutonium waste loss decontamination performance has been satisfactory. However, poor uranium stream decontamination made it necessary to process all uranium through the silica gel "tail end" treatment.

The TBP plant production was 122 percent of the official forecast. A feed supply shortage limited plant production to one line until July 19. The second line was started up at this time and a combined rate of 9 tons per day was achieved only for a very short period as the B line RA column feed pump failed on July 20. Replacement of this pump was completed on July 26. Each line operated at a 4 ton rate for the balance of the month. The waste losses and decontamination performance were satisfactory for this period. The downtime for the facility was 474 hours for the A line because of feed shortage and 132 hours for the B line due to the failure and replacement of the RA column feed pump.

The UO_3 production was 105 percent of the official forecast. Low production rates were caused by the Redox shutdown and the reduced output of the TBP plant. A total of five cars of powder was shipped offsite during the month.

The waste evaporators operated throughout the month with volume reductions of 34 percent at B and 27 percent at T.

The waste metal removal rates were slow during the month due to the final cleanout activities in the primary sludge bearing tanks. A total of six tanks was officially declared empty during the month.

[redacted]

SEPARATIONS SECTION (Continued)

The tritium Extraction Line operated the entire month at capacity rates. By month end virtually all of the feed material had been processed. The production for the month was 155 percent of the official forecast.

GENERAL

Personnel

Total on Roll July 1, 1954	3548
Accessions	75*
Separations	38*
Total on Roll July 31, 1954	3585

*Does not include intra department transfers.

J. E. MAHDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF JULY, 1954

August 9, 1954

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

INVENTOR	TITLE
R. D. Schilling, Reactor Section	"C Pigtail Remover Clamp"

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

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MONTHLY OPERATING REPORT

JULY 1954

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MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
July, 1954

August 6, 1954

I. RESPONSIBILITY

The July 1 reorganization resulted in no change in Section responsibility but effected some shifting of responsibility among the Sub-sections. The Plant Engineering Sub-section was discontinued as an organizational component. The Process Sub-section was expanded to include the Inspection Unit and Manufacturing Engineering Unit. The Projects and Personnel Practices Unit was established. This Unit assumed responsibility for Project Administration, Contact Engineering, Landlord, Personnel, Cost and Budget, and Suggestion Evaluation functions.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	July	June	Year to Date
Acceptable Pieces Canned (4")(Tons)Gross	8	6	130
Acceptable Pieces Canned (4")(Tons)Net	8	5	126
Canning Yield (4")(%)	62.3	74.2	69.7
Acceptable Pieces Canned (8")(Tons)Gross	260	284	1501
Acceptable Pieces Canned (8")(Tons)Net	259	280	1490
Canning Yield (8")(%)	81.3	81.3	79.7
Total Acceptable Pieces Canned (Tons)Gross	268	290	1631
Total Acceptable Pieces Canned (Tons)Net	267	285	1616
Acceptable Pieces Canned (4" and 8") (% of Forecast)	91	98	92
Autoclave Frequency (4")(No./M)	.00	.00	.00
Autoclave Frequency (8")(No./M)	.01	.00	.01
J-3 Slugs Canned (pieces)	0	756	35964
N Slugs Canned (pieces)	0	0	33177
Chem.10-66 Canned (pieces)	4086	1367	6199
Special Request (man hours)	690	685	4107
305 Routine Tests (man hours)	206	251	2659
305 Special Tests (man hours)	491	595	6572

1. Statistics (Continued)

	July	June
Average Steam Generated (M lbs/hr)	18.9	22.1
Maximum Steam Generated (M lbs/hr)	29.0	38.0
Total Steam Generated (M lbs)	14,100	15,900
Coal Consumed (Tons)	866	1,092
Sanitary Water from 3000 Area (Million gals)	50.7	45.5
Total Water from 3000 Area Average Rate (GPM)	1,137	1,052
Chlorine Residual (ppm)	.36	.35

2. Activities

The net production of acceptable slugs was 267 tons of which 97 percent were eight-inch. There was no significant change in the eight-inch canning yields from the previous month. Canning of four-inch material on a production basis was completed. Future canning of four-inch slugs will be limited to production test material.

There were two autoclave failures during the month, one a regular eight-inch uranium slug and the other a thorium slug. The uranium piece failure was caused by a thin can wall at the base of the cap, probably caused by gouging when inserting the slug in the can. Investigation of conditions during the canning of that lot of material revealed no abnormalities. The thorium autoclave failure was the first failure of dry-canned material detected so far. The base had separated from the can wall. It appeared that this failure may have been due to a tensile failure of the can wall near the base of the can.

The quality of bare slugs received during the month has shown some improvement. The bare slug reject rate has dropped from a peak of about 20 percent in June to an average of 11 percent for the month of July.

Work was completed on the revision of the Metal Preparation Section budget for FY 1955 and FY 1956. A goal forecast for FY 1955 was also prepared. A new code structure was established and is reflected in the budget and goal forecast. Better cost distribution, better cost analysis and control are anticipated as a result of this code structure.

An abrasive cut-off machine was put in operation to aid in the rapid evaluation of production material. This machine makes the preparation of metallurgical samples both simple and rapid.

Results of analysis of production tests have indicated the possibility that slugs heat treated in slug form rather than rod form might be superior insofar as pile performance is concerned. Consequently the decision was made to heat treat part of the regular slug production in slug form, and a request has been forwarded to have Fernald ship approximately 40 percent of all slugs to Hanford as unheat-treated material. It is planned to heat treat these slugs at Hanford prior to canning.

All MINT samples have been completed for hydrogen analysis. The extraction line used for MINT sample analysis is being modified to analyze additional samples of uranium for hydrogen.

The portable instrument repair shop moved to the field and operated from temporary quarters within the vicinity of the 200 Areas during the July 4 weekend. This was in connection with the Area cleanup.

3. Special Operations

Four thousand, eighty-six acceptable thorium slugs were produced with a canning yield of 57 percent. The low yield resulted from die sizing cans on small diameter bare thorium pieces.

Four hundred, forty-two enriched aluminum alloy slugs were canned (although none have yet been accepted) by the hot press method to evaluate different canning and cleaning techniques. Preliminary results indicate that an unusually high canning yield of over 90 percent may be realized. The balance of approximately 2,400 bare slugs on hand will be hot press canned for the thorium program in August when the new equipment in 313 Building becomes available.

4. Schedule Variance

Canned slug production was nine percent below forecast as a result of insufficient metal receipts to maintain an adequate bare slug inventory.

B. Equipment Experience

1. Operating Continuity

Canning line efficiencies remained at 92 percent. The major cause of downtime was failure of duplex agitators and canning jacks.

Two furnace failures occurred in the 313 Building. One resulted when an element open-circuited and one failure was due to a metal spill. Four crucibles were replaced.

2. Inspection, Maintenance and Replacements

An eight-inch gate valve was installed in the water main loop feeding the 384 Building to insure against failure of water service in case of main loop water line failures. There was no interruption of service.

Work was completed in converting two theodolites for use in checking the trueness of the graphite holes in the 105-K piles. These theodolites, normally focused on an object farther than 100 feet distant, can now be focused on anything from 3½ feet to infinity.

C. Improvement Experience

1. Production Tests

PT-313-38MT "Canning of Cored Uranium Slugs" (HW-31900)
The balance of 188 recovered cored slugs were canned by the lead dip method. These slugs had been rejected during the initial canning of this material in June.

2. Process Tests and Revisions

An economic evaluation of the use of grooved cans indicate that production and yield gains to be realized will result in $20,000 yearly savings.

3. Inventions and Discoveries

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

D. Events Influencing Costs

1. Labor Variance

Production for the month of July was approximately 9 percent below forecast due to metal unavailability. The curtailment of slug canning rates and training of new men for the fifth canning line adversely affected labor costs. On the basis of the above, direct labor unit cost is expected to increase .01 per unit.

2. Material Variance

No significant change is expected in direct material unit cost.

3. Other

Other costs are expected to increase .02 per unit due to a nine percent decrease in production.

E. Plant Expansion

1. Project Status

Project CA-514 - "Expansion of 300 Area Production Facilities"
Detailed design remains at 97% complete, with construction 48% complete. Total project costs to date are $3,625,000 with an authorized total of $5,085,000. The ready-for-use date of August 15, 1954 for Phase I will not be met due to vendors' difficulty in supplying equipment for the finishing line.

Project CG-573 - "Hanford 3X Program, 300 Area"
Scoping of this project is complete, detailed design is complete and construction is 97% complete. Final acceptance tests of the hot press canning equipment are in progress. Total project funds is $860,000 with total costs as of July 15 being approximately $842,600. The deletion of slurry recovery, irridite and bond test facilities resulted in an adjustment of funds in the final project proposal.

2. Plant Engineering

Salt bath heat treating equipment is nearly completed and installation is scheduled for the first week of August.

The developmental model of the automatic quench machine was installed in the canning area during the month. Preliminary test runs were satisfactory.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-32279	Monthly Report, Process Sub-section Metal Preparation Section, June,1954	EW O'Rorke	7-1-54
HW-32352	Statistical Quality Report, 300 Area January thru June, 1954	Process Sub-section	7-6-54
HW-32371	Metal Preparation Section Evaluation of FMPC Uranium Slug Cores, March thru June, 1954	SM Gill	7-12-54
HW-32509	Report of Uranium Accountability in Metal Preparation Processes for Quarter 6-30-54.	GF Yost	7-21-54

2. Non-Routine

HW-32367	Fabrication History of Uranium Slug Cores "B" and "C" Lots	SM Gill	7-8-54
HW-32478	Manpower Requirements for Production Facilities - 313 Bldg.	BB Bradford	7-20-54

I. PERSONNEL

A. Organization

On July 1 the Plant Engineering Sub-section was discontinued as an organizational component and Projects and Personnel Practices Unit was established. The Manufacturing Engineering Unit was transferred to the Process Sub-section. The Inspection Unit was transferred from Operations Sub-section to the Process Sub-section.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	2	2	0
Operations	172	182	+10
Power & Maintenance	292	301	+ 9
Process	84	83	- 1
Projects & Personnel Practices	9	9	0
Section Total	559	577	+18

C. Safety Experience

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

D. Radiation Experience

There was one radiation exposure over 300 mrads at the Zyglo inspection operation. Immediate steps were taken to provide adequate shielding to prevent recurrence.

E. Personnel Activities

1. Visits and Visitors

W.M. Mathis and F.K. Peck attended the General Electric Management Conference at Association Island during the month.

C.E. Frantz visited the Marine Iron Works in Tacoma, Washington to assist the vendor on fabrication of process equipment for Project CA-514.

H.A. Jones accompanied a buyer from Purchasing on a visit to the Portland Glove Company to determine possible economics of purchasing gloves manufactured by different fabrication methods.

2. Meetings

Forty-seven members attended training programs during the month.

Information meetings held for members of the Metal Preparation Section included a meeting on "Redox Operation" by O.F. Beaulieu of Separations Section and one on "New Canning Methods" conducted by J.J. Cadwell of Technical Section. General information meetings were held by the Sub-sections.

L.P. Henderson presented three meetings to members of the Section on contamination control and radiation hazards.

An orientation program relative to radiation hazards was formulated and initiated to assist new employees in understanding the necessity for adhering to radiation monitoring policies.

[redacted]

Richland, Washington
August 6, 1954

MANUFACTURING DEPARTMENT
REACTOR SECTION
JULY, 1954

I. RESPONSIBILITY

Responsibilities assigned to the Reactor Section were not changed during July. Changes in functional responsibilities assigned to the Sub-Sections within the Reactor Section as a result of organizational changes effective July 1, are described in detail in the "Organization" section of this report.

II. ACHIEVEMENT

A. Operating Experience

In July, new record highs were established for plutonium input production and for total reactor input production. Plutonium input production, which was 106.4 percent of forecast and 103.9 percent of June production, exceeded the previous record month, January, 1954, by 2.6 percent. Total reactor input production exceeded the previous record month, June 1954, by 3.2 percent. These records were achieved despite only a slightly improved time operated efficiency, 87.1 percent as compared to 86.6 percent in June and 86.3 in January, and the same or slightly lower maximum power levels at all reactors as the result of increased river water temperatures. Improved individual time operated efficiencies at C and H Reactors, the two highest producers, were primarily responsible for attainment of the record production.

A. Operating Experience (continued)

Output plutonium production in July was 125.0 percent of forecast, with the discharge of low and high concentration material, approximately 150 and 115 tons, respectively, being 75.3 and 178.3 percent of forecast. Low concentration plutonium output was considerably greater than in June as a result of 200 Area requirements returning to approximately forecast amounts. Plutonium output other than low concentration material was approximately 80 percent over forecast as a result of continued discharging of large amounts of higher concentration material at C Reactor in converting to a program of low concentration production at this reactor. Of the approximate 265 tons discharged in July, about 40 percent was discharged at C Reactor. This created a large material handling problem. During July, on the basis of improved ruptured slug experience, the goal concentration for material other than low concentration material was raised 50 megawatt days. Some concern was indicated at month end when it was found that the low megawatt day per ton material would not meet 200 Area specifications. As a result, it is planned to reduce the concentration at C Reactor approximately 10 percent.

Mint input production at C and DR Reactors was 106.3 percent of forecast because of a higher than forecast time operated efficiency of 89.6 percent at DR Reactor. Mint production continued to decrease in July as the result of the discharging of all remaining first loading J-N tubes in June without recharging any J-N material. Remaining are 917 J-N tubes of the second loading at DR Reactor, and 110 J-N tubes at C Reactor. Input production devoted to the Mint program was 52.3 and 3.7 percent at DR and C Reactors, respectively.

The 13 tube J-Q program at H Reactor continued without incident. Initial charging for an additional approximate 400 tube J-Q program has been tentatively re-scheduled from October to August.

There were no increases in established maximum operating levels of the reactors. Because of increased river temperatures, all reactors operated at approximately the same or slightly lower power levels as compared to June.

A total of 11 slugs failed at all reactors during July. In addition, one ruptured "J" slug, discharged in June, was found. Rupture distribution by reactor and type is tabulated below.

	B	C	D	DR	F	H	Total
Regular four-inch	1						1
Regular eight-inch	1	1				1*	3
"J" material				7**			7
Cored enriched uranium		1					1
Totals	2	2	0	7**	0	1*	12**

A. Operating Experience (continued)

*This rupture, a longitudinal split or "broken" slug, was found while picking up metal in the discharge chutes at H Reactor.

**These figures include a second ruptured "J" slug, found during July, in the material from tube 2270-DR discharged June 30.

The total outage time resulting from the 10 ruptures which required outage time was approximately 175 hours, as compared to an approximate 160 hours caused by 28 ruptures in June. In July, only two or approximately 18 percent of the 11 ruptures were discharged during minimum scram recovery time using the "quickie" discharge equipment as compared to approximately 65 percent removal of ruptures in June under similar conditions. This decrease was the combined result of a higher rate of stuck ruptures, and the fact that several ruptures were pushed during scheduled outages.

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	78.8	75.7	92.2	89.6	96.1	89.9	87.1
Reactor Outage Time (Hrs)							
Plutonium Production	153.5	179.8	44.6	2.9	29.2	57.5	467.5
Special Irradiations and Tests	4.0	1.0	13.5	74.4	--	17.5	110.4
Total	157.5	180.8	58.1	77.3	29.2	75.0	577.9
Reactor Unscheduled Outage Time (Hrs.)	157.5	89.1	1.4	77.3	1.0	0.4	326.7
Metal Discharged (Tons)	31.8	105.3	29.2	13.7	1.8	78.0	260.
Water Quality (ppm Iron)							
Raw Water - Average	0.20	0.23	0.18	0.24	0.10*	0.25	-
Raw Water - Maximum	0.30	0.32	0.24	0.34	0.13*	0.38	-
Process Water-Average	0.007	0.010	0.012	0.008	0.009	0.011	-
Process Water -Maximum	0.019	0.017	0.024	0.024	0.020	0.020	-
Water Pumped (MM Gals)							
Bldg. 190 to reactor	1870	3277	2058	1786	1973	2174	13138
Bldg. 182 to 200 Areas			49			382	431
Bldg. 181	5964		4634		2370	2927	15895
Steam Generated (MM Lbs)	147		222		140	109	618
Coal Consumed (Tons)	8770		13561		8159	6491	36981

*During the last four months, iron analyses on raw water at F Reactor have been significantly below similar analyses at the other reactors because of the use of an erroneous reference curve at F Reactor. This condition is being corrected.

2. Activities

Operation at all reactors was limited primarily by process tube outlet water temperature limits, 95C at D, DR, F, and H Reactors based upon temporary trip-before-boiling limits, 95 C at C Reactor as an intermediate outlet water temperature established by the Manufacturing Department, and 100 C at B Reactor as authorized by Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits." Graphite temperature limits also restricted operation at C and H Reactors for short intervals during the month.

Considerable concern has been expressed within the Section over results obtained from a graphite sample which was removed from F Reactor during the month. This sample, which was exposed at ambient temperatures in the reactor atmosphere, showed the highest burnout rate measured to date, possibly higher by a factor of 10. It is believed that this is the result of abnormally high percentages of oxygen in the atmosphere. This high oxygen content could have resulted from the low pressures being maintained on the reactor gas system. Steps are being taken to improve the analytical methods for measuring oxygen content in the gas system, and a close study of all gas equipment and operating techniques is being made to insure minimum leakage of the system.

Water treatment experience continued to compare favorably with past years. Activated silica addition at C, D, and DR Water Plants was discontinued in July. Costs were near or at record lows for this season of the year at all water plants except D Water Plant where a test was being run.

Coal shipments were curtailed between July 6 and 31 as the result of the miners' "holiday". During this period approximately 30,000 tons of coal were withdrawn from storage, reducing the reserve approximately 18 percent.

Shipment of irradiated "J" slugs by motor truck from DR Reactor to Arco, Idaho, continued during July, with approximately 1720 slugs shipped in 26 casks. This completed the shipment of available "cool" material until the middle of August. Recent tests have indicated that irradiated "J" slugs can be shipped after 60 days of cooling rather than the 90 days originally required. Following the discharge of the remaining first loading J-N tubes at DR Reactor in June, shipment of Mint material from Building 105-B to Building 108-B was resumed in July. All available material was shipped in approximately 450 casks.

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

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	0	1	2
Rala	0	5	1
Production Tests	10	52	5
Total	10	[illegible]	[illegible]

B. Equipment Experience

During July, 18 reactor scrams occurred. Of these, 17 were caused by normal Panellit system difficulties at all reactors, and one scram at H Reactor was caused by a low pressure Panellit trip resulting from a Building 190-H pump turbine governor bearing failure. Total outage time charged to these scrams was 4.9 hours. While the number of scrams resulting from normal Panellit difficulties remains about the same as in recent months, this performance represents considerable improvement with regard to scrams resulting from other instrumentation and other causes.

Horizontal rod work continued to decrease in July as compared to recent months. It was necessary to remove only one rod from service, No. B at H Reactor, when a leak test of all horizontal rods at this reactor revealed leaks in both the rod and the thimble. Rod maintenance work was confined to F Reactor where No. A rod was installed and returned to service, and where several additional graphite blocks were removed from No. 8 rod channel preparatory to installation of a half-rod of the new design.

Failure of thermocouples installed in the graphite stringers at B, D, DR, and F Reactors continued during July. At month end, 33 of the 90 thermocouples at DR Reactor were out of service. Most of the failures occurred in the central portions of the stringers. It is planned to attempt replacement of some of these defective thermocouples during the extended horizontal rod outage at DR Reactor. Comparable rates of failure have been experienced at B, D, and F Reactors.

Three process tube leak testing programs, two at C Reactor and one at B Reactor, amounting to approximately 10, 50, and 25 hours of outage time respectively, occurred. At C Reactor, after testing approximately 240 tubes, tube 1794-C was found to be leaking. Later in the month, based upon continued high water collection rates, approximately 720 additional tubes were tested without locating another leak. At month end water collection rates remained above normal, indicating the possibility of continued leakage into the reactor. This condition is being studied closely to determine what action is appropriate. At B Reactor, testing of approximately 660 tubes revealed six corroded Van Stone flange leaks. These tubes were either replaced or blanked off.

No. 5 process water pump motor in Building 190-H failed during a routine start in July, requiring replacement of the stator. Failure of a governor bearing on No. 14 process water pump turbine in Building 190-H caused a momentary reduction in water pressure, and resulted in a reactor scram as noted above.

During the last half of the month, high winding temperatures were experienced in Building 190-C process pump motors, necessitating periodic operation of all 10 units. The high temperatures were attributed primarily to low voltage on the BPA system during the evening hours.

B. Equipment Experience (continued)

Building 190-C process pump oil systems were modified to raise the oil levels in the resevoirs. In addition, all couplings between motors and speed increasers were insulated to prevent circulation of motor shaft currents.

C. Improvement Experience

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

PT-105-4-MR Suppl. C (Poison Column Control Facility)
Of the 15 tubes at DR Reactor equipped with poison column control facilities, five currently contain permanent flattening, leaving 10 available for start-up control. Use of the facility in July resulted in a 325 megawatt day gain during one startup, and on another occasion permitted recovery from a scram which would have otherwise resulted in a minimum time outage.

PT-105-8-MR (Uranium Charging During Reactor Operation)
A third tube of uranium was successfully charge-discharged at B Reactor during July at a reactor level of approximately 900 megawatts, and at a tube power of approximately 630 kw. This tube and the two tubes charged in June are scheduled for discharge in August.

PT-105-506-E (Recirculation Studies)
Recirculation tube 0961-H remained on process water throughout July while extensive revisions were made to the flow and pressure lines and controls to increase the reliability of the system.

PT-105-517-E Suppl. A & B (100 Areas Filter Plant Tests)
This test was terminated by the Pile Technology Sub-Section after demonstrating that increased filter flow rates are feasible with the present filters on a test basis, and are worthy of additional investigation on a production basis. Complete results are being documented by the Pile Technology Sub-Section.

PT-105-530-E (Full Pile Burnout Experiment)
One central tube channel at H Reactor was mined during July, completing the work on this production test.

PT-105-562-A (Slug Evaluation at Increased Levels for Tritium Production)
Irradiation of J-N columns at C Reactor continued without incident. Eight columns were discharged for examination in accordance with the test schedule. At month end, 40 columns remained in the reactors.

C. Improvement Experience (continued)

One new and five revised Process Standards--Reactor were approved and issued during July. These were, in order, standards titled: "Process Tube Outlet Water Temperature and Tube Power Limits--Slug Rupture," "Film Formation Control," "Make-Up of Uranium and Uranium-Alloy Tube Charges," "Make-Up of Special Irradiation Tube Charges," "Total Exposure Limit for Process Slugs," and "Distortion of Graphite Moderator, Process Tubes, and Reactor Shields." The most significant changes involved: 1. Establishing tube power and outlet water temperature limits as a function of goal exposure and tube water flow in an effort to limit the number of slug ruptures resulting from slug corrosion and slug core failure; and 2. Transferring the responsibility for calculating, plotting, and evaluating Panellit gage deviation data from the Operations to the Power Sub-Section based upon past experience which has indicated the advisability of observance of process tube film data by those responsible for control of the water treatment process.

The report of invention indicated below was submitted during July:

Inventor	Invention
R. D. Schilling	"C Pigtail Remover Clamp"

D. Events Influencing Cost

Reactor maintenance costs continued to be beneficially affected in July as in June by decreased amounts of ruptured slug and horizontal rod work, and by the absence of major scheduled or unscheduled maintenance programs. These costs were adversely affected by an increase in the amount of process tube leak testing work as described in "Equipment Experience."

Future reactor maintenance costs will be favorably affected by the recent re-design of gun-barrels for the six operating reactors which reduces fabrication cost of each gun-barrel from $500 to $68. The re-design of the gun-barrels was accomplished by Maintenand Sub-Section personnel, and the savings resulted from the relaxation of tolerances which permitted use of commercially available tubing. Savings on a recently completed order for 200 gun-barrels amounted to approximately $86,500.

Improved water quality is reflected in a decrease of approximately $21,000 in filter plant chemical costs as compared to June.

Reactor Section charges to the expansion program for July continued to increase as additional manpower was added to the Section for training prior to the staffing of the K Reactors.

Preliminary estimates indicate that plutonium irradiation unit cost and total irradiation unit cost will be slightly less than the comparable June costs, and may possibly be less than the record low unit costs established in November, 1953. These reduced costs are primarily the result of the record production during July.

E. Plant Development and Expansion

1. Project Status

The most significant Reactor Section project activity is reported below. Further details concerning projects may be found in the report, "Status of Reactor Section Projects, Informal Requests and Budget Items," F. A. R. Stainken to J. H. Warren, dated July 19, 1954.

CA-512 (100-K Facilities)
Design of the K Reactors and Water Plants is essentially complete. Construction completion percentages estimated by the AEC as of July 16 are:

Overall	86
KW Reactor	90
KE Reactor	75
KW Water Plant	96
KE Water Plant	82
General Facilities	87

At KW Reactor installation of horizontal and vertical rods is continuing. Installation of process tube nozzles is nearly complete, and front face piping has been hydrostatically tested. At KE Reactor, the downcomer has been erected, vertical rod and Ball 3X equipment has been installed, and heavy aggregate concrete is being placed in the top shield.

All Building 190 secondary pump casings have been judged defective and will not be accepted for normal plant operation. The six best casings will be installed temporarily in Building 190-KW, and this plant will be operated at reduced flow until acceptable casings are installed. The first six acceptable casings of revised design are tentatively scheduled for installation in Building 190-KE, with KW replacement scheduled later during an extended shut down.

CA-431 (100-C Plant)
Building 105-B effluent flow diversion to the 107-C effluent sewer continued to delay repairs to the east 107-C tank baffles. The Reynolds Aluminum Company bid for fabrication of C Reactor horizontal rod extrusions was accepted, and delivery is expected about September 1. The rods will be assembled by Western Gear Company of Seattle, and delivery of assembled rod tip sections has been promised 16 weeks after delivery of the Reynolds extrusions. Delivery of outlet tubing connectors is expected about August 15.

E. Plant Development and Expansion (continued)

CG-558 (Reactor Plant Modification for Improved Production) Scope design is estimated to be 76.3 percent complete, and total design to be 25.8 percent complete as of July 23. The decrease in total design percent completion was caused by the change in scope for F and H Reactors from partial to complete modification. As directed by the AEC, the Project Proposal will be rewritten to include this change.

CG-584 (Moisture Monitoring System for Detection of Leaking Process Tubes - 105-C) An AEC directive was received authorizing funds totalling $59,000 for this project and specifying a July 1, 1956 completion date. A purchase requisition for 100 Foxboro dewcells has been forwarded by the Design Section to the Reactor Section for approval.

RDS-D-10) RDS-D-11) (Reactor and Water Plant Design Development) Documents HW-32268 (Rough Draft), "Disaster Safety System for Hanford Reactors," and HW-32150, "Memorandum on a Technical and Economic Comparison of Alternate Dual-Purpose Reactor Plants," were issued by the Engineering Department. The first document contains a recommendation as to the type of system required and discusses the source, utilization and effectiveness of this auxiliary water system. Studies are continuing on evaluating the degree of hazard involved in the failure of the steam supply for the turbine process pumps in the B, D, DR, F, and H Water Plants.

The Engineering Department was requested to conduct a study of reactor cooling water effluent pressurization. It is planned to be completed in time to permit re-evaluation of the effluent system now planned under Project CG-558.

2. Plant Engineering

A number of enginering and development studies were active in the Section during July. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in document HW-32625. Several items of interest are reported below.

2. Plant Engineering (continued)

The Ultra coustic material was received in July, and was installed for test purposes in the bay between Nos. 10 and 11 pump foundations in Building 190-C. The partial shroud for motor enclosure tests at Building 190-H is near completion. Sound level readings at these locations are scheduled for early in August for comparison with previous readings. Preliminary observations indicate that use of this type material will materially aid in solution of the noise problem.

A survey and cost estimate was prepared for the installation of check valves in the steam header lines at each end of the Building 190 in areas B, D, F, DR, and H. Previous calculations have shown that at higher power levels, sudden loss of steam to the Building 190 turbines could result in insufficient water being supplied to the reactor in the critical seconds following the accompanying scram. The check valves, isolating the interior Building 190 steam supply piping, are expected to provide the necessary steam for proper water pressure "decay" under these conditions.

The program directed toward equipping one reactor as a demonstration unit for large-scale charge discharge during operation progressed along the lines of equipment design, reactor testing using the poison column control facility and flow laboratory studies. Design and procurement of prototype charge-discharge equipment proceeded satisfactorily during the month, with orders for six hydromotors and six sets of front and rear nozzle valves having been placed. Flow laboratory tests have been started with a mock-up which is similar hydraulically to the prototype charging machine.

Photographing of fire and fire bed conditions, a part of 100 Area coal utilization studies, was suspended during July pending renewed shipment of vendor coal after the miners' "holiday."

F. Significant Reports

1. Routine

Monthly operating reports issued for June were:

HW-32317-A	Reactor Section	JH Warren	7- 8-54
HW-32423	Operations Sub-Section	RO Mehann	7- 1-54
HW-32297	Process Sub-Section	OC Schroeder	7- 1-54
HW-32274	Plant Engineering Sub-Section	FAR Stainken	7- 1-54
HW-32330	Radiation Monitoring Sub-Section	PC Jerman	7- 6-54
	Maintenance Sub-Section	EE Weyerts	7- 7-54
HW-32323	Power Sub-Section	JC McLaughlin	7- 6-54

F. Significant Reports (continued)

Other routine reports issued during July included:

HW-32523	"Monthly Progress Report, Reactor Section Expansion, July, 1954."	HT Wells	7-23-54
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items."	FAR Stainken	7-19-54
--	"Reactor Section Process and Cost Improvement Report, April to June, 1954."	JH Warren	7- 8-54
HW-32293	"Reactivity Balance and Associated Data--May and June, 1954."	AP Vinther	7- 1-54

2. Non-Routine

HW-30589	"Reactor Section Standard Analytical Methods--Process Sub-Section	--	7-14-54
HW-32277	"Additional Studies on the Economics of Uranium Charge-Discharge During Operation."	GH Dyer	7- 1-54
HW-32342	"Rear Crossheader Pressurization."	AK Hardin	7- 7-54
HW-32372	"Process Test MR-105-23, Cathodic Protection of the 107-C Retention Basins."	RR Bloomstrand	7-12-54
HW-32409	"Outage Time Economy"	AP Vinther	7-13-54
--	"Semi-Annual Achievement Report --Goals for 1954--Reactor Section"	JH Warren	7-21-54
--	"Visit to Pacific Oerlikon Company, Tacoma, Washington, Fabricator of the Charging Machines, Project CA-512-R."	EH Kolts	7-20-54
--	"Visit to the A and S Specialty Coatings Company."	CW Higby	7-30-54

III. PERSONNEL

A. Organization

Effective July 1, several organization and responsibility changes were made in the Reactor Section. The most significant of these changes included the following:

1. The Maintenance Sub-Section was reorganized on an area unit basis rather than a functional or craft unit basis. To the four basic area maintenance units, responsible for routine maintenance, an Unusual Maintenance Unit to handle major maintenance jobs of a non-routine nature, and a Planning and Scheduling Unit to plan and coordinate maintenance activities were added. In addition, all engineering functions of the Sub-Section were transferred to the Process Sub-Section.

A. Organization (continued)

2. The Plant Engineering Sub-Section title was changed to Projects and Personnel Practices Sub-Section. Other changes included the establishment of a Personnel Practices Unit whose assigned responsibilities consist essentially of administrative duties related to personnel practices, reports, suggestion evaluation, training and development, and cost analysis. In addition, manufacturing engineering activities were transferred to the Process Sub-Section.

3. In the Process Sub-Section, a Manufacturing Engineering group was established to include manufacturing engineering personnel transferred from the Plant Engineering Sub-Section, and maintenance application engineers transferred from the Maintenance Sub-Section. The Process Sub-Section will thus provide all process and non-process engineering services within the scope of Reactor Section responsibility. In addition, this new unit will provide minor design and "as-built" services for the Section.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	3	2	- 1
Operations	324	324	0
Maintenance	518	514	- 4
Projects & Personnel Practices	31	32	+ 1
Power	441	449	+ 8
Process	42	58	+16
Radiation Monitoring	73	72	- 1
Section Total	1432	1451	+19

Changes during July included 13 transfers into the Section, two transfers out of the Section, 15 new hires, seven terminations, two reactivations and two deactivations.

C. Safety Experience

There were no Major or Sub-Major Injuries or Near-Serious Accidents in the Reactor Section during July.

At month end, approximately 90 percent of the employees in the Power Sub-Section required to wear ear protection had been equipped with either ear plugs or ear muffs.

D. Radiation Experience

One Class I Radiation Incident, No. 372, occurred at Building 105-DR on July 4, when the main building ventilation system was shut down permitting radioactive gas to accumulate in the building. The shut-down occurred when the air surge tank was isolated from the line controlling dampers on the supply fans, causing the dampers to close. Return of the air supply to the dampers corrected the condition shortly. No over exposure of personnel occurred. Details of this incident are reported in document HW-32354.

Surveys for radioactive specks have been completed in all 100 Areas by the Radiological Sciences Department. Widely scattered particles, assumed to be ruthenium, were found, but experience has indicated that the contamination is fixed and is not located in places where it is a radiation problem. The exclusion areas at B and C Reactors have been cleaned up on a test basis, but no other cleanup action is planned in the immediate future.

Preliminary studies of the flow through the 105-H Retention Basin indicated that the water channeling beneath the outlet HM chambers has only a one-hour hold up time in the basin rather than the normal two and one-half hour time. This situation may account for the high activity reported at H Reactor during the past several months.

E. Personnel Activities

At month end, 15 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 10 of these are on assignment under the rotational training program.

Principal items of interest during July in regard to employee communication were on a sub-section basis. The Operations Sub-Section held a two-week training school for seven new supervisors in the Sub-Section. Meetings were conducted by members of supervision in the Sub-Section, and concerned all phases of supervisory problems related to reactor operation. At three reactors, five meetings for operating personnel were conducted by Process Sub-Section physicists to discuss Process Standards, scram recovery techniques, operating philosophies, and allied subjects. In addition, a series of round-table discussions on "Leadership" was held, and a Management Training Program was started to familiarize Operations Sub-Section shift supervisors with some aspects of higher supervisory duties.

H. T. Wells of the Projects and Personnel Practices Sub-Section and A. R. Maguire of the Operations Sub-Section attended General Electric Management conferences at Association Island on July 26 to 28, and July 22 to 24, respectively, and visited KAPL, West Milton, and the General Engineering Laboratory on July 29 and 30 and July 19 to 21, respectively.

E. Personnel Activities (continued)

H. A. Zweifel and C. W. Higby visited the A and S Specialty Coating Company at Kennewick, Washington, to observe and discuss methods of flame spraying plastic coatings on steel and concrete with respect to possible 100 Area applications.

The July issue of the "Journal of the American Water Works Association" contained an article on "Hanford Atomic Energy Plant--Water Supply" by W. R. Conley of the Process Sub-Section. This article had been presented previously in May at the American Water Works Association Convention in Seattle.

A. J. Sperry, president of the Panellit Corporation, visited HAPO on July 26 and 27. During his visit, he discussed with Reactor Section representatives the servicing of Panellit systems installed at HAPO reactors, and design problems related to new facilities.

Richland, Washington
August 6, 1954

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
JULY, 1954

I RESPONSIBILITY

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

II ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	July		June	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	61	2	60	1
Charges completed in Conc. Bldgs.	61	2	62	0
Special charges - Conc. Bldgs.	5		4	
Charges completed-Isolation Bldg.	191		122	
Average Waste Losses, %	2.6		2.3	

a. Bismuth Phosphate Operations (Continued)

	July	June
Special charges-Isolation Bldg.	33	8
Material balance, %	101.9	96.2
Yield through Process, %	99.3	93.9
Average cooling time (days)	98	99
Minimum cooling time (days)	74	82

b. Redox Operations

	July	June
Equivalent charges started	144.0	41.7
Charges completed	138.5	47.7
Tons Uranium delivered to storage	69.0	41.7
Average Production Rate per operating day, Tons	5.2	6.5
Average Daily Operating Rate for the month, Tons	2.2	1.4
Average yeild, %		
Uranium	97.0	96.8
Plutonium	100.6	98.8
Total Waste Loss, %		
Uranium	0.47	1.7
Plutonium	0.73	2.15
Average cooling time, days	106	80
Minimum cooling time, days	76	74
Percent down time	57.1	78.7

c. 234-5 Operations

	July	June
Batches completed through Task II	62	34
Runs completed through Task III	58	34
Reduction Yield, RM	97.5	98.7
Waste Disposal, units	1.32	0.39

d. UO_3 Operations

	July	June	To Date
Uranium drummed, Tons	189	359	6787
Uranium shipped, Tons	168	411	6740
Average cooling time, days (Redox)	170	105	
Minimum cooling time, days (Redox)	106	95	
Waste loss, %	0.23	0.07	

e. TBP Operations

	July	June	To Date
Tons received from Metal Removal	182	203	4160
Tons shipped to UO_3 Plant	171	202	4003
Average Production Rate per operating day, Tons	9.06	8.49	
Average Daily Operating Rate for the month, Tons	5.52	6.73	
Average yield, %	95.1	97.62	
Total Waste Loss, %	1.56	1.40	
Ratio Waste Volume returned to Volume removed	1.22	1.21	
Percent Down Time	39.0	20.7	

f. Mint Operations

	July	June
Charges started	163	0
Vacuum Tanks Filled	101	0
Product Purity, %	92.6	-
Average Yield, %	100.6	-
Product loss to stack, liters	0.80	0

g. Power

	200 East	200 West
Raw water pumped, gpm	1 491	7 160
Filtered water pumped, gpm	450	1 066
Steam generated, lbs/hr	32 813	138 000
Maximum steam generated, lbs/hr	52 000	205 000
Total steam generated, M lbs.	24 413	102 735
Coal consumed, tons (est.)	1 678	6 054

h. Waste Storage

	Equivalent Tons U	
	July	June
Metal Waste reserve storage capacity-T Plant	840	929
1st Cycle reserve storage capacity-T Plant	489	156
Metal Waste reserve storage capacity-B Plant	145	145
1st Cycle reserve storage capacity-B Plant	162	4
Redox Waste reserve storage capacity	1476	1509

2. Activities

a. Redox Processing

Redox operations were resumed on July 18 after the Phase II

a. Redox Processing (Continued)

major equipment changes which started with the shut down on June 10. Start-up was effected at a 5 tons per day rate with subsequent increases to 7 tons per day on July 24 and 7.5 tons per day on July 27. It was necessary to rework the first three batches of salt waste produced after start-up due to a high plutonium content. Subsequent plutonium waste loss and decontamination performance has been satisfactory. Poor uranium decontamination performance made it necessary to process all uranium product through the silica gel "Tail End" test facility. Process modifications in the "Head End" and column stream adjustments have thus far failed to achieve decontamination of uranium product to within the gamma specification.

On July 2, a second attempt was made to flush the 291-S Redox stack, since the first attempt on June 29 had to be terminated due to high air contamination levels in 202-S. Extensive sealing of all possible leak points between operating areas and radiation zones prevented a recurrence of the air condition experienced in June. The stack flushing rig twice sprayed the inside of the stack and the breeching. Samples taken during the flushing indicated the removal of approximately two and one half curies of activity, primarily ruthenium.

b. TBP Processing

A feed supply shortage limited TBP Plant production to one line (B) until July 19, when Metal Removal rates were increased such that sufficient feed was available for parallel operations. Failure of the B Line RA Column feed pump on July 20 and subsequent replacement difficulties caused a shut down until July 26. Both lines were operating at the end of the month at rates of 4 tons per day with waste losses and decontamination performance being highly satisfactory.

c. UO_3 Processing

Feed shortages due to the Redox Plant shutdown and reduced output from the TBP Plant resulted in the lowest production (193 tons) in the UO_3 Plant since November, 1953 (180 tons). Mild foaming in the calcination furnaces continued throughout the month, but did not affect operating continuity. High gamma feed received from the TBP Plant during the early part of July increased the radiation levels of the calcination furnaces to a maximum of 90 mrads/hr. This was reduced to 30 mrads/hr following receipt of better quality feed in the latter part of the month.

d. Waste Metal Removal

Waste removal rates were in general rather slow during the month due to final clean-out activities in the primary sludge

d. Waste Metal Removal (Continued)

producing tanks. Supernate blending continues at 241-CR on material transferred from the 241-BX area. Metal removal from the 241-U area was discontinued, since material which had aged for a number of years became depleted. Metal waste remaining in the 241-U area consists of material sent from T Plant within the past year and current metal wastes being produced by that plant. Current sludge removal operations are centered in Tanks 104-BX and 101-TX with the former tank expected to provide the highest yield.

e. T Plant Processing

Operations continued in the T Plant processing of 215 MWD material until July 27 when a special stainless steel basket containing nine 600 MWD slugs, to be used in connection with a 100 Area test program, were placed in the 4-5-L dissolver to have their aluminum jackets removed during a normal coating removal operation. The basket was inadvertently not removed at the end of coating removal, and the nitric acid used in the dissolving operation completely corroded the chain which held the basket suspended in the dissolver. All efforts to retrieve the basket were unsuccessful, and the nine slugs were dissolved with the regular charge. The two runs made from this dissolver charge will be segregated and held for Engineering Department approval before shipping.

f. Isolation and Metal Fabrication Processing

Isolation operations were steady except for an unusual processing condition experienced on July 14. A chemical reaction, more violent than normal, occurred which resulted in general cell contamination and the exposure of four employees to rather severe plutonium contamination. Initial bioassay results indicated very little plutonium deposition.

Metal Fabrication activities were normal until July 27 when a fire was experienced which involved plutonium metal turnings from Hood 200-A. The entire area to the rear of the RMA Line was grossly contaminated and all production operations were suspended. On July 29, Tasks II and III were again placed in operation after decontamination efforts were successful. Decontamination of Tasks IV and V is being continued on a round-the-clock basis at the end of the month.

g. Mint Processing

When operations were resumed in the Mint Plant on July 1,

g. Mint Processing (Continued)

liquid nitrogen consumption became excessive due to a partial collapse of the storage tank. Maintenance repairs were not possible, but operations were maintained by increasing the supply of liquid nitrogen from the vendor.

3. Special Operations

a. Waste Evaporators

July operating data for the 242-B and 242-T waste evaporator are as follows:

Evaporator	Gallons Feed	Gallons Bottoms	Gallons Condensate	% Volume Reduction
242-B	620 812	409 063	211 749	34.1
242-T	485 925	354 000	131 925	27.1

4. Schedule Variance

July production variance from the July Annual forecast is as follows:

Redox plutonium and uranium production both exceeded forecast with 141% and 125%, respectively, of the forecast being attained.

T Plant production was 114% of forecast. The combined plutonium production of the two separations plants was 132% of forecast.

The TBP Plant produced 122% of forecast.

The UO_3 Plant produced 107% of forecast.

The Metal Fabrication Building produced 129% and 183% of forecast for Models 110 and 130 final shapes, respectively.

Mint production was 155% of forecast.

B. Equipment Experience

1. Operating Continuity

Redox down time totalled 427 hours for completion of the Phase II changes started in June.

1. Operating Continuity (Continued)

Total down time for the TBP Plant was 474 hours for A Line and 132 hours for B Line. The A Line outages were due to feed shortages and those for B Line were for replacing the RA Column feed pump and pulse generator.

2. Inspection, Maintenance and Replacement

a. Canyon and Silo Crane Maintenance - Redox

Canyon crane maintenance during the month consisted mainly of festoon cable repairs, three changes of optical heads and the replacements of an impact wrench and trolley drive motor. The silo crane required repair of an impact wrench brake and backturns in the ten ton cable.

b. Oxidizer Installation - Redox

During installation of the new oxidizer (H-4) pot, started on July 3, it was found that ribbing on the bottom of the pot prevented proper seating on the "Y" pad. A decision to trim off the interfering metal was abandoned because of stresses that would be introduced and high radiation levels found upon survey. Shims of 1½" thickness were placed on the "Y" pad studs, four jumpers were reduced 1½" in length and thirteen new jumpers were fabricated to fit the re-positioned pot and tower. Work was completed on July 11.

c. RA Column Feed Pump Failure - TBP "B" Line

The B Line RA column feed pump was taken out of service on July 20 due to bearing failure. The shaft, bearings, and impellers were replaced and the unit returned to service on July 26.

d. Calcination Furnace No. 8 - UO_3 Plant

A gasket leak on calcination furnace #8 permitted process material to flow onto the front half of one heating element. The unit was damaged such that it was necessary to replace a portion of the element. During the shut down of the furnace, the entire pot assembly was given a complete inspection and overhaul, and lower ratio gears were installed to reduce agitator blade rotation.

e. B-2 Centrifuge Failure - 224-T

The B-2 centrifuge failed on July 12 due to worn bearings in the drive head assembly. A replacement motor and drive assembly were installed and the old unit will be repaired and retained as a spare.

f. Liquid Nitrogen Storage Tank - Mint Plant

When operations were resumed on July 1, it was noted that liquid nitrogen consumption was excessive and the outer surface of the liquid nitrogen storage tank was frosted, indicating a partial collapse of this tank. A replacement tank was ordered and the liquid nitrogen supply was increased to maintain continuity of operations. Previous repairs to the tank in February precluded the making of additional repairs at this time and replacement is mandatory.

g. Fireproof Filter Failures - Task II - 234-5

The two fireproof filters for exhaust air from Hood No. 9 Task II failed after being in service approximately three months. The filter media had deteriorated much more rapidly than did the CWS filters which had a life expectancy of from eight months to one year in this location. CWS filters will again be used in this location until a study can be completed on some new type fireproof filter that will give better service.

C. Improvement Experience

1. Process Tests and Revisions

a. Backcycle of 3DW to 2DF - Redox

The backcycle of the 3D column waste stream to the F-2 tank (second uranium cycle concentrator) was initiated coincident with the July 18 start-up. Under this process revision, the waste from the third uranium cycle, with relatively low fission product content and fairly high ANN concentration, is added to the uranium stream from the first cycle. Simultaneous concentration of the two streams is accomplished in the F-2 concentrator and the concentrated material is used as presalted feed for the second uranium cycle. It is estimated that savings approximating $200/ton uranium processed will result due to a decrease in total ANN consumption and waste storage requirements.

b. UO_3 Reactivity Improvement with Sulfamic Acid Additive

The off-site customer for HAPO produced UO_3 has requested four additional carloads of the improved oxide produced with the sulfamic acid additive since a 15% improvement in fluoride conversion was obtained for the original test carload shipped in April.

It had been previously reported that severe caking was experienced in the calcination furnaces during the original test production of UO_3 containing the additive. There was

b. UO_3 Reactivity Improvement with Sulfamic Acid Additive (Cont'd.)

evidence, however, that furnace #7 gave little or no caking and further testing indicated this was due to the lower agitator speed in this furnace, 30 rpm versus 38 rpm in the other electric furnaces. Lower rpm gear assemblies have been installed in furnaces #8 and 13 for additional production of the improved oxide.

c. Use of Chemical 70-58 Oxide, Task III, 234-5

The use of 70-58 oxide in the place of the metal as an alloying agent in Task III was started during the month. The initial oxide addition factor was calculated to produce an alloy containing 1. 15% of the alloy, assuming a 95% yield from the oxide. When casting analysis showed the 70-58 content to be below expectations, the oxide addition factor was adjusted to a 90% oxide yield basis.

2. Inventions or Discoveries

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

D. Events Influencing Costs

Separations Section expenditures, for July, are expected to show a slight decrease from the June level of expenditures as a result of the continued Redox shutdown for Phase II equipment changes and the decrease in TBP and UO_3 production. The decrease in cost is primarily due to the reduced essential material requirements associated with the lower production.

Adoption of recycling the 3DW stream in Redox to the second uranium cycle is expected to effect savings approximating $200/ton uranium due to reduced ANN consumption and waste storage requirements.

A concerted effort during the past six months to reduce costs in the analytical laboratories through changes in procedures, equipment arrangements, and reduced sampling loads was completed in July. It is estimated that applied materials savings of $27,400 per year and applied labor savings of $58,000 per year will result from the program. The work force has thus far been reduced by eleven analytical personnel, and it is expected that four additional personnel will be released.

E. Plant Development and Expansion

1. Project Status

a. Project CA-513-A, Purex

Purex design is 99.9 per cent complete compared with a scheduled 100 per cent. Construction as of July 15 is 52.7 per cent complete compared with 58.7 per cent scheduled completion. The "Ready for Operation" date estimated by the Contact Engineering Unit remains at August 1, 1955.

The project proposal for the vacuum acid fractionator addition to the Purex Plant has been approved by General Electric Company and is awaiting A.E.C. approval. The estimated project cost is $590,000 including two reboiler spares. Proposed "Ready for Use" and Project Completion dates are 14 and 15 months, respectively, after total project authorization.

The A.E.C. requested critical review of the requirements for two additional spare concentrator units for Purex.. It was pointed out that four of the concentrators contain inferior steel plate and operating life for a reasonable period cannot be assured. Since procurement time for replacement units is approximately 18 months, the A.E.C. agreed to procure two additional spares. The Purex Plant will thus have seven initially delivered concentrator units, five installed and two spares. Two additional spare units will be fabricated of quality material for later delivery. A total of eight spare tube bundles will also be procured.

b. Project CG-496, Recuplex Installation

Construction efforts were increased during the month following the receipt of valves and vessels. Construction forecast indicates the "ready for use" date as January 1, 1955. Cisco Construction Company completed the underground Waste Storage Facilities in July.

c. Project CG-551, 234-5 Expansion

Fabrication and mock-up of Task II equipment in the 272-W Shops continued approximately one week behind schedule. Minor Con-construction has started the installation of final inspection facilities in Room 192 of the 234-5 Building.

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

Stage I: Approximately four weeks work remains for completing insulation of waste concentration vessels D-11 and D-12 and for jumper fabrication and mock-up. Essentially all other Stage I equipment has been installed in the Redox Plant.

Stage II: Construction of the plutonium concentration building (233-S), ANN storage tanks (211-S), and uranium storage tanks (204-S) is in process. Design work continues on the silica gel

d. Project CG-535, Redox Expansion, Phase II (Continued)

facility for decontamination of the final Redox UNH stream. Completion of all phases of the project is scheduled for March 1, 1955.

e. Project CG-587, TBP Waste Scavenging

Approval to proceed with the installation of facilities for scavenging TBP waste and cribbing of supernatant has been received from the AEC and detailed design is proceeding. It is expected that the facilities will be ready for use by September 15, 1954.

f. 4X Program, B Plant Reactivation

At the request of the AEC, plans were formulated during the month to reactivate the 200 East Area Bismuth Phosphate Plant for processing the requested quotas of low level material.

A letter project proposal, HW-32431, Hanford 4X Program, Request for Advance Authorization of Design for Critical Procurement, was issued requesting $800,000 to allow procurement of critical items to commence at once. Of this amount, $100,000 for design was immediately approved and made available. Replacement of the canyon crane optical equipment is deemed the most critical, from a procurement standpoint, of all equipment required for the reactivation program.

It is estimated that a period of about one year will be required to procure necessary replacement equipment and personnel and to place B Plant in operation.

2. Plant Engineering

a. Standards Program

Existing Operations labor standards were revised to conform with the newly established codes and have been submitted to the Cost Analyst for use in the July cost reports. Additional study of basic elements will be made to determine standard manpower requirements for each cost code. A new standards policy is being prepared as a basis for tighter standard costs. A table which relates the heating requirements to the average monthly wet bulb temperature was developed to improve the accuracy of steam standards calculations for building heating and ventilation.

b. Engineering Assistance

Funds in the amount of $14,250 have been allocated for purchase and installation of a close[redacted]uit television

b. Engineering Assistance (Continued)

system to be used in conjunction with Redox crane maintenance. Purchase specifications have been written and a purchase request issued for bids on the required equipment.

Engineering assistance on air balance and job control was given on the successful flushing operation of the Redox stack on July 2. Deficiencies detected in the ventilation system were noted and recommendations submitted to building supervision for their correction.

A complete re-balancing of the 234-5 ventilation system was completed this month. In addition the ventilation balance group conducted surveillance checks on all buildings in East and West areas. Deficiencies were noted and corrective measures recommended to appropriate building supervision. It is noted that the recently applied glass filter media placed over the exhaust grills in 234-5 did check the possible spread of the July 27 fire in the RMA Line area.

c. Work Simplification

Information was developed and presented to the HAPO Works News for an article on the Work Simplification program released July 9. Additional information was developed for the General Electric News Bureau for an article to be released to the general public and for possible use in technical magazines. Arrangements and schedules are being developed for the next program estimated to start September 15.

d. Property Management

Effective July 1, concurrent with adoption of the decentralized Separations Section organization, landlord responsibilities were delegated to the appropriate Sub-Sections. Only General-Area buildings, exclusive of those assigned the Power and Maintenance Sub-Section, remain within the jurisdiction of the General-Area Landlord.

F. Significant Reports Issued

1. Routine

Number	Title	Author
HW-32684	Separations Section - Redox Plant Sub-Section Monthly Report - July, 1954	R.T. Jessen
HW-32695	Separations Section - Metal Recovery Plant Sub-Section Monthly Report - July, 1954	V.R. Chapman
HW-32683	Separations Section - T Plant Monthly Report - July, 1954	C.T. Groswith

1. Routine (Continued)

Number	Title	Author
HW-32686	Separations Section - B Plant Sub-Section Monthly Report - July, 1954	T. Prudich
HW-32679	Separations Section - Z Plant Sub-Section Monthly Report - July, 1954	W.N. Mobley
HW-32698	Separations Section - Mint Plant Sub-Section Monthly Report - July, 1954	S.G. Smolen
HW-32654	Separations Section - Analytical Sub-Section Monthly Report - July, 1954	L.M. Knights
HW-32601	Separations Section - Radiation Monitoring Sub-Section Monthly Report - July, 1954	A.R. Keene
Official Use Only	Separations Section - Projects and Personnel Practices Sub-Section Monthly Report - July, 1954	O.V. Smiset
Official Use Only	Separations Section - Power and Maintenance Sub-Section Monthly Report - July, 1954	C.P. Cabell
HW-32615	Separations Section - Essential Materials	J.P. McBride
HW-32389	Separations Section Waste Status Summary	D.E. Peterson
HW-32306	Essential Material Area Report to Cost and Purchasing	J.P. McBride
HW-32308	Essential Material Consumption Report for the Redox Plant	J.P. McBride
HW-32307	Essential Material Consumption Report for the TBP Plant	J.P. McBride
HW-32591	Monthly Progress Report - Plant Expansion Projects and Personnel Practices Sub-Section Separations Section - July, 1954	F.A. Hollenbac
HW-32083	Separations Process Council Meeting	O.F. Beaulieu

2. Non-Routine

HW-32305	Essential Materials Inventory - July 1, Orders placed with Purchasing	G.E. Cooper
HW-32285 (RD)	Direct Materials Standards for the 231 Building	R.H. Sillett
HW-32286 (RD)	Direct Materials Standards for Processing 215 MWD Material at T Plant	R.H. Silletto
None	Annual Landlord Report - Separations Section - June 30, 1954	R.M. Shervem
HW-32326	Redox Process Division Meeting	O.F. Beaulieu
HW-32468	Combined Status Reports - Redox Contamination April 29, 1954 to June 21, 1954	C.R. Anderson
HW-32467	Terminal Status Report - Redox Contamination	C.R. Anderson
HW-32382	Radiation Incident, Class I, No. 373	R.N. Donelson
HW-32542	Radiation Incident, Class I, No. 374	W.G. Westover
HW-32583	Radiation Incident, Class I, No. 376	W.G. Westover
HW-32611	Radiation Incident, Class I, No. 377	J.F. Jackson
HW-27067	The Effective Energy Output of the 220 KVP Westinghouse Industrial X-Ray Unit in the 3745 Building	G.L. Helgeson
HW-32392	Estimated Activity in Redox Sand Filter	H.F. Soule

III PERSONNEL

A. Organization

On July 1, major organizational changes became effective when the Separations Section was decentralized into six Plant Sub-Sections and four Service Sub-Sections. Each of the Plant Sub-Section Superintendents has complete responsibility for operations, process, maintenance, and utility service functions within his plant. The Service Sub-Sections provide specialized services which encompass all of the Plant Sub-Sections.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	2	2	0
Redox Plant Sub-Section	202	201	- 1
Metal Recovery Plant Sub-Section	279	278	- 1
Z Plant Sub-Section	161	160	- 1
T Plant Sub-Section	174	174	0
B Plant Sub-Section	2	3	1
Mint Plant Sub-Section	39	37	- 2
Power & Maintenance Sub-Section	378	374	- 4
Projects & Personnel Practices	54	62	8
Analytical Sub-Section	168	163	- 5
Radiation Monitoring Sub-Section	76	77	1
Section Total	1535	1531	- 4

C. Safety Experience

There were two sub-major injuries in the Separations Section in July. The first occurred on July 19 in the Mint Plant Sub-Section when a Utility Operator pinched his left-index finger between two transfer casks during decontamination operations. Two small chip fractures to the finger bones were detected by subsequent X-Rays.

The second injury occurred on July 30 in the Power and Maintenance Sub-Section when a Pipefitter dropped a pipe bending "shoe" on his right foot above the cap in his safety shoe. One bone in the employee's instep was broken.

D. Radiation Experience

Four Class I radiation incidents occurred and involved: (1) an abnormal reaction in a process vessel in the 231 Building which resulted in severe plutonium contamination in cell air. Four employees were exposed without respiratory protection; however, initial bioassay results indicated very little deposition (No. 374, HW-32542); (2) ignition of gram quantities of plutonium metal turnings during a plastic bag sealing operation at Hood 200-A, RMA Line. The backside of the operating line was grossly contaminated; however, good judgment exercised by the operators present

D. Radiation Experience (Continued)

prevented panic, the spread of contamination, and minimized personnel exposure (No. 376, HW-32583); (3) an over-batch size condition in the P-1 vessel in 231 Building (No. 377, HW-32611); and (4) an over-batch size condition in the C-4 tank, 224-T Building, (No. 373, HW-32382).

Failures of the new Cambridge glass-fiber fireproof filters in the 234-5 and 231 Buildings were noted with resultant reduced efficiency for plutonium filtration. This has resulted in a significant increase in the 231 Building stack air contamination. A review of filter specifications is underway.

In the Redox Plant, the H-5 caustic scrubber vapor discharge was routed through a second caustic scrubber (J-2), a packed fiber-glass filter (J-3) and finally to the air tunnel leading to the sand filter. With the replacement of the vessel vent filter (J-5) in June and rerouting of this air stream through the sand filter, both of the primary sources of stack emission are now routed through the sand filter after receiving improved scrubbing or pre-filtering. Since startup of the building, an estimated 7 curies entered the sand filter in an eleven-day period. Ruthenium stack emission averaged 0.4 curies per day and I^{131} stack emission averaged < 0.1 curie per day.

The second attempt to flush the Redox stack was completed with little difficulty on July 2. Single exposures up to 250 mrads were allowed for several Minor Construction personnel. An estimated 2 to 3 curies, primarily ruthenium, were flushed from the stack and breeching.

E. Personnel Activities

1. G.E. Selection Program for Supervisors

Evaluation was completed for four Power and Maintenance and four Operations Unit personnel during the month.

2. Operations - Process Training

Twenty-two Operations and Hot Semi-Works personnel completed the Purex "A" process sampling training during the month.

3. Information Meeting - Radiation Monitoring

An information meeting and round table discussion was held on July 1 in Richland for all Radiation Monitoring Sub-Section exempt personnel.

4. Visitations

R. S. Bell attended the Management Development Training sessions at Association Island on July 26 - 28.

DECLASSIFIED

ENGINEERING DEPARTMENT

JULY 1954

TECHNICAL SECTION

The production test to evaluate the rupture behavior of Al-Si dip canned cored normal uranium fuel elements has proceeded to the point that sufficient slugs for two tubes of cored elements and two tubes of companion solid elements are ready for charging in C Pile at the next shutdown. Additional tests in the wood-splitter--water cooled, induction heater--of paired, cored, and solid slugs confirmed the initial data indicating considerable improvement in the number of cycles to failure of the cored slug over the solid companion piece.

The sealed anodized films which have been formed on aluminum in sulfuric or oxalic acid baths and have been sealed at 170 C are still satisfactory after exposure to pile water at 90 C for 150 days. Some fuel elements with this hard protective film were charged into D Pile for a production test. One tube was discharged after 23 days and will be examined.

Approximately 500 U_{235}-Al "J" slugs to be used with the forthcoming thorium charge have been hot-press canned in development equipment in the 314 Bldg. An additional 2000 J slugs will be hot-press canned in the new manufacturing equipment in the 313 Bldg., which should be ready the first part of August.

During July, all piles except C were limited by trip-before-boiling considerations and were held to 95 C outlet temperature. B Pile operated on a 100 C maximum on a test basis.

During June, all of the 25 M metal was finally discharged from the piles. The overall rupture rate of 25 M metal was 0.0293, as compared to 0.0034 for the triple dip, eight-inch material.

A test authorizing a 400 tube irradiation of thorium metal over the coming year is in the process of authorization. The first load will consist of 160 tubes at H Pile.

The four enriched cored slugs, exposed in the C Pile hot spot since February, were discharged on July 5 following a split-type rupture of the downstream test piece. The slugs had accumulated a calculated 1550-1600 MWD/T exposure at a specific power of 75-70 kw/ft. The ruptured slug may have received a considerably higher exposure than this due to the high flux intensity at the downstream position. The other three test slugs were intact and in apparent good condition. This improved fuel element performance may be compared with that of similarly enriched solid slugs which operated at only slightly higher specific powers and incurred an average of one rupture in four slugs at an exposure level of 650 MWD/T. The four cored slugs will be given detailed radiometallurgical examination.

Four 4-inch mechanically bonded slugs were charged into D Pile for duplicate exposure to 200 and 600 MWD/T. Two similar slugs will be charged in the H-Loop facility for evaluation of 150 C coolant temperature operation,

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including study of diffusion at the uranium-aluminum interface.

The stage I installation of Phase II equipment in the Redox Plant was concluded on July 18. The new columns have performed satisfactorily and few difficulties have been experienced with the new evaporators. Nevertheless, the capacity of the new H-4 is limiting the IAF batch size at approximately 3.9 tons of uranium (vice 4.3 tons for H-4 Oxidizer No. 3). Since start-up at 4 to 7.5 tons of uranium per day, back-cycle of 3 DW as the salting agent for the 2D column has been employed. Uranium and plutonium recovery and plutonium decontamination have been excellent; on the other hand, uranium decontamination has been plagued by a solids problem and the associated entrainment problem. Use of the temporary silica gel tail-end facility has been necessary to adequately decontaminate the uranium product from an average gamma ratio of 7.2 to 1.5. Part of this achieved decontamination is probably due to filtration by the silica gel bed. About 250 bed volumes have been put through since regeneration; however, a break-through is expected soon.

Since the processing vessels were flushed during the Redox shutdown, the initial batch of uranium having an 897 MWD/T pile exposure was segregated. Preliminary data obtained on the neutron emissivity of the first metal button obtained from this material indicates about 71 ngs.

In the Waste Metal Recovery Plant, cleanout operations following the continuous water sluicing-blending technique permitted release of tanks 101, 102, and 103-HX and 102-TX in less than one month as compared to the two to three months required with clean-out operations following the "standard" sluicing technique.

Further tests with sulfamic acid as an additive to improve reactivity of UO_3 have continued to indicate that slower agitator speeds (higher torque) will eliminate the caking problem. Furthermore, tests with 0.06 weight percent sulfamic acid have given improved reactivity without caking in a pot with a standard agitator speed which had earlier given a poor record with 0.08 weight percent. On the basis of these studies a production test of several carloads of sulfamic acid treated powder is underway at month end.

Among the experimental studies conducted on the Purex Process was a semi-works scale demonstration that reduced pressure operation is an adequate answer to high nitric acid concentration corrosion conditions.

Removal of ruthenium from the Redox uranium product solution by ozonization could potentially make possible the elimination of the present permanganate head-end volatilization step with its attendant difficulties of ruthenium contamination of the Redox canyon and of the environs around the Redox Plant. Laboratory studies have established that the addition of ammonium persulfate to Redox E-12 solution, prior to the ozonization step, effectively reduces the induction period for volatilization of ruthenium. Demonstration of this process on a semi-works scale was initiated and preliminary results indicate that ruthenium was successfully removed with an

indicated 5-fold arithmetic decontamination factor after sparging for one to two hours.

Two solvent extraction runs, made in a high efficiency 3-inch diameter pulse column (containing an estimated 50 to 80 equivalent stages) with the objective of establishing whether any difference in the separation factor exists for the uranium isotopes (U^{235} and U^{238}), have indicated a most probable value of approximately 1.00003 for the separation factor per stage. This value is not firmly established because it is within the limits of error of the isotopic analyses made by the mass spectrograph. However, it can be concluded that the separation factor per stage is very small under the solvent extraction conditions employed in these tests.

Twelve uranium-magnesium fuel material specimens were charged in the Materials Testing Reactor on July 28 for endurance testing. These specimens consist of 50 volume percent uranium in a matrix of pure magnesium or a matrix of magnesium-1.4 weight percent silicon alloy enclosed in Zircaloy-2 capsules. Irradiation will be in duplicate to 1000, 5000 and 10,000 MWD/T after which the specimens will be metallographically examined and bend tested. The specific power generated during irradiation will be 16 kw/in^3, as compared to the standard 1.75 kw/in^3 for Hanford slugs.

Tensile properties have been determined for the first group of zirconium samples exposed in a process channel at 50-60 C to 190 MWD/AT (6×10^{19} nvt). The effect of irradiation on yield strength was greatest percentage-wise, ranging from a 50% increase for annealed material down to an 11% increase for 50% cold worked material. Tensile strengths increased 6,000-10,000 psi, corresponding approximately to a 10% increase for the entire 0-50% cold work range investigated. Elongation decreased markedly for annealed specimens (from 33% down to 23%), but was relatively unaffected for cold worked specimens. Changes in the reduction in area were variable, both increases and decreases occurring. Finally, no significant differences in the modulus of elasticity were observed due either to cold work or to irradiation.

High temperature Purex studies continue to promise increased plant capacity but cast some doubt on attainment of improved decontamination. Stripping to higher final uranium concentrations in C columns was demonstrated at 70 C, thus increasing the uranium concentrator capacity to 25 tons U/day. Favorable results were also obtained in studies of plutonium and uranium recovery in A columns, solvent stability in A columns, and ferrous ion stability in the IB system. Unfortunately, the latest two-cycle decontamination results were far from meeting product specifications with respect to zirconium and niobium, for reasons not yet understood. However, the ruthenium decontamination remained high and well within specifications.

Scavenging of long-lived fission product activity from fresh Bismuth Phosphate first cycle waste was successfully demonstrated using the nickel ferrocyanide precipitation procedure. Whether scavenged separately or following pooling with coating removal waste, the residual radiocesium and

strontium in the supernatant solutions were well below the cribbing tolerances. With development of this method, all liquid Bismuth Phosphate process wastes can now be discharged directly to the ground, storage being required only for the alkaline solid residues.

DESIGN SECTION

Distribution of Design Section effort for the month was as follows: 37% to Research and Development; 30% to the Expansion Program; 17% to Reactor Plant Modification for Increased Production, and 16% to other projects and design orders including 4-X Program. This represents approximately the same distribution as reported for June.

Major activity in connection with the Expansion Program included the following:

a. Project CA-513 Purex Tank Farm condenser revisions continued forward on a priority basis. Design for the new contact condenser was advanced 70% to 90% complete.

b. Detailed design for 1706 KE Recirculation facilities was advanced 5% to 20% complete.

c. Work continued on construction as-builts, design revision, design field liaison and witness of Acceptance Test Procedures for the 100-K Reactor Plants and Purex Separation Facility.

Total design for Project CG-558, Reactor Plant Modification for Increased Production, advanced to 26%. Scope design is 75% complete and detailed design is 20% complete based upon the revised schedule including maximum process water flow at F and H Reactors.

Hanford 4-X Program objectives and general plant requirements were received from HOO, AEC. A Preliminary Project Proposal requesting authorization of $800,000 for the initiation of design and procurement was prepared and transmitted to the AEC. Authorization of Project CG-597, 200-300 Areas, in the amount of $100,000 and CG-599, 100 Area, for $100,000 was received from the AEC later in the month.

Emphasis was directed toward a study of Purex utility requirements to determine if the 200 East powerhouse and water facilities will "bottleneck" the plant.

Economic studies are nearing completion on evaluating the effects of variations in reactor physics parameters or dual-purpose and single-purpose reactors. Specifically, these studies evaluate the effect on unit cost of reactor power level, specific power, and lattice spacing.

Work was started on establishing a technical basis for a dual-purpose reactor capable of producing 400,000 kw of electrical power to be used as a primary

example of reactor plant economics for the Special Study. Also these studies will be used to evaluate the technical and economic comparisons between small and large size reactor plants.

PROJECT SECTION

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

Project No.	Title	Scheduled Completion	Actual Completion
CG-496	Recuplex	63%	56%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	97
	Reactor & Bldg.	100	93.3
	KE - Water Plant	97	83
	Reactor & Bldg.	78	77
	General Facilities	94	87.2
CA-513	Purex Facility, Part "A"	66	57
	Part "D"	69	72
CA-514	300 Area Expansion	67	48
CG-535	Redox Capacity Increase, Phase II	68	70
CA-539	Redox 241-SX Tank Farm	99.7	99.7
CA-546	Fuel Element Pilot Plant	37	14
CG-573	Hanford 3X Program - 300 Area	96	99

At the request of AEC, the Minor Construction Management Unit made preliminary plans to establish warehousing service and vehicle maintenance shops in White Bluffs, the effective date to be August 16, 1954. The contract with J. A. Jones Construction Company was modified to increase the maximum of Minor Construction labor force from 700 to 1,000, and to extend the effective period, by one additional year, to June 1, 1956.

The first Purex concentrator was shipped via Panama Canal on July 27.

The 2101-M Building was reactivated for machining of graphite required for two test reactors. Actual shop work is scheduled to begin August 2, 1954. Responsibility for storage of graphite was transferred to Purchasing and Stores Section.

At 105-KW, the installation of front face nozzles was completed, and the final testing was started. Acceptance testing of KW Reactor progressed to about 7% complete. Repair of gas leaks revealed by the gas leak test was begun on July 19, and the leakage rate is now about 450 C. F. H.

Aggregate for the top shield of 105-KE Reactor has been placed to the tops of girders and out to the side crates. The Ball 3X hoppers have been air-tested, and the rear face crossheaders have been installed. Electrical equipment was being given preliminary run-in. Final inspection of the 151-KW Building was completed with minor exceptions. The 183-KW Filter Plant has been tested satisfactorily on automatic backwash. The 107-KW Retention

Basins have been filled with water for leak tests.

The last major placement of concrete in the 202-A Building structure was made July 28. Cell wall kickplates were completed in place on July 21, and kickplates are being installed in the Hot Pipe Trench. Welding of stainless steel piping in the Hot Pipe Trench was about 50% complete, and installation of carbon steel piping has started in the Piping and Operating Gallery. Equipment installation included 14 vessels. All four elevators were completed except for testing, and the shielded cab of the main crane has been completed except for painting. Ductwork for the Canyon was 74% complete, and for the Service Area 85% complete. The inside electrical work for the Canyon and the Service Area was 60% complete, and all graphic panels and transducer racks have been mounted. Good progress was made on steel tanks for 203-A Storage, the 211-A Chemical Tank Farm, and the 241-A Tank Farm.

ORGANIZATION & PERSONNEL

Total on Roll, July 1, 1954	1,500
Accessions	32
Separations	32
Total on Roll, July 31, 1954	1,500

Effective July 1, 1954, two new sections were established within the Engineering Department, Advance Engineering and Engineering Administration, with W. K. Woods and R. J. Schier, respectively, appointed to head up these sections.

O. H. Greager

for A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

ENGINEERING ADMINISTRATION SECTION

JULY 1954

Effective July 1, 1954, the Classified Files was re-organized. A new component titled "Classified Files Accountability and Control" was established and assigned to the former Classified Files supervisor. The new group will be responsible for (1) document audit and inventory, (2) reduction of the total document accountability through retirement, destruction, declassification, etc., (3) IBM applications to classified document control.

Plans were completed during the period for the first of the 30-day Plant-wide cyclical inventories of classified documents and mailing of the inventory listings was started July 30, 1954.

Plant-wide publicity in connection with the Technical Information program was emphasized during the month. Early in the month a bulletin was issued which discussed the need for Files' coverage of unclassified, Official Use Only and UNDOCUMENTED-CONFIDENTIAL reports which contain permanently useful technical information. On July 12 a brief summary of the new inventory requirements was issued as a Management News Bulletin. This release stressed the importance of proper certifications. It was followed on July 26 by a Management News Bulletin defining (1) the custodianship responsibility for documents directed to a supervisor but signed for by his secretary and (2) the responsibility which a supervisor has when he certifies to a document inventory taken by his secretary. A proposed Security Bulletin covering these problems in more detail was drafted and forwarded to Security for issuance.

During the month the following major contract activities were handled:

1. Special Agreement No. G-44 between General Electric and the City of Kennewick covering the use of a Government-owned chlorinator was returned without action by the Commission. They have requested that no further work be carried on by General Electric in a contract sense and that the use of the chlorinator would be recorded by the Commission on a Memorandum Agreement.

2. Sale Agreement No. S-1 between General Electric and Universal Underwriter's Agency Incorporated covering the transfer to Universal of damaged cable was executed by Universal on July 23.

3. Special Agreement No. G-45 between General Electric and Travelers Indemnity Co. was executed by Travelers on July 16.

4. Modification No. 3 to Rental Agreement No. G-8 between General Electric and Industrial X-Ray, Inc., providing an extension of time for the contract was executed by Industrial X-Ray on July 13.

5. Modification No. 1 to Special Agreement No. G-39 between General Electric and Telefilm, Inc., covering a change in security require-

ments and clarifying General Electric's liability to pay transportation charges of classified material was executed by Telefilm on July 20.

6. Modification No. 1 to Special Agreement No. G-30 between General Electric and Charles Bruning Company, Inc., covering an extension of time of the contract was sent to Bruning for execution On July 23.

7. Modification No. 1 to Special Agreement No. G-31 between General Electric and Abadan-Spokane covering an extension of time and the revision of the contract price was sent to Abadan for execution on July 20.

8. Modification No. 3 to Special Agreement No. G-38 between General Electric and Morgan Wheeler and Company and Hugh H. Russell covering an extension of time necessitated by General Electric's failure to furnish adequate survey information was sent to the Commission for approval July 20.

9. Special Agreement No. G-46 between General Electric and Precision Tube Co., Inc., covering the development and fabrication of an expanding spline was sent to the Commission for approval July 20.

10. Modification No. 1 to Special Agreement No. G-45 between General Electric and Travelers Indemnity Co. providing for an extension of time was sent to the Commission for approval July 26.

R. J. Schier

R. J. SCHIER, MANAGER
ENGINEERING ADMINISTRATION SECTION

[redacted]

PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JULY, 1954

[redacted]

VISITORS AND BUSINESS TRIPS

I Kaplan, M. Fox, and R. Powell visited here from Brookhaven National Laboratory, Upton, L. I., New York, July 19 and 20, for discussions and observations in connection with reactor technology.

C. C. Miles visited here from Westinghouse Corporation, Idaho Falls, Idaho, July 13 through 29, for research on the STR.

P. C. Cohen visited here from Westinghouse Atomic Power Division, Pittsburgh, Pennsylvania, July 19 and 20, to discuss proposal of a new high pressure, high temperature in-pile recirculation loop.

R. E. Baars visited the Grover Company, Inc., Detroit, Michigan, July 26 and 27, to witness acceptance tests on pneumatic facility intended for KE Pile. He also went to Knolls Atomic Power Laboratory, Schenectady, New York, July 28 and 29, to discuss in-pile experiments and special request irradiations.

J. H. Brown attended the West Coast Meeting of the American Physical Society at the University of Washington in Seattle July 7 through 10.

R. L. Dickeman and G. C. Fullmer visited Knolls Atomic Power Laboratory, Schenectady, New York, July 19 and 20; Oak Ridge National Laboratory, Oak Ridge, Tennessee, July 21; and the E. I. Du Pont de Nemours, Inc., Savannah River Operations, Aiken, South Carolina, July 22 and 23, to discuss reactor operation, control, and neutron economics.

J. C. Johannesen visited the Phillips Petroleum Company, Idaho Falls, Idaho, July 27 through August 1, for the installation of GEH-4 experiment.

G. E. Wade visited the Phillips Petroleum Company, Idaho Falls, Idaho, June 30 through July 6, July 20 through 23, and July 27 through August 2, for installation of GEH-4 experiment.

C. R. McNutt and J. M. Roberts attended the American Society of Mechanical Engineers' "Heat Transfer and Fluid Mechanics Institute", at the University of California in Berkeley, June 30 through July 2.

R. S. Paul visited Phillips Petroleum Company, Idaho Falls, Idaho, July 28 through 31, for technical liaison on instrumentation for Hanford experiment. M. R. Wood visited there for the same reason July 27 through August 2.

A. T. Whatley visited Phillips Petroleum Company, Idaho Falls, Idaho, July 6 through 9, to administer borescoping assistance to the ANP staff.

R. B. Richards and P. H. Reinker attended the Association Island conferences at Henderson Harbor, New York, July 12 through 14.

P. H. Reinker visited the General Electric Company, Schenectady, New York, July 15, to inspect manufacturing plants, and Knolls Atomic Power Laboratory, Schenectady, New York, July 16, for technical discussions of the SAR program.

ORGANIZATION AND PERSONNEL

	June	July
Administrative	5	5
Pile Development	65	66
Pile Engineering	78	79
Special Irradiations	24	24
Technical Liaison	4	5
Total	176	179

Pile Development: One Junior Engineer transferred in from Radiological Sciences-Radiation Monitoring, and one Engineer II was reassigned to the Technical Liaison Unit.

Pile Engineering: One Engineering Assistant 12 was hired, and one Technical Graduate - Rotational transferred in from Management-General.

Technical Liaison: One Engineer II was assigned to the Unit from Pile Development Unit.

PROCESS TECHNOLOGY

Power Level Limits

During July all piles except C were limited by trip-before-boiling considerations and were held to 95 C tube outlet temperature except B which operated at 100 C maximum. C Pile has been limited by reactivity because of the low concentration program although 12 additional enrichment tubes were charged during the month.

Process Changes

A new process specification was approved covering pre- and post-irradiation handling of "C", "J" and enriched uranium slugs.

Slug Rupture Experience for July

Uranium Failures - Three failures occurred in normal uranium slugs during the month, two at B Pile and one at C Pile. At B Pile, a 4" and an 8" piece failed near goal exposure. They are both stuck in process tubes and have not yet been examined. The side failure at C Pile occurred at 185 MWD/T and is the first rupture of B-lot metal.

Enriched Cored Slug Failure - One of the enriched slugs charged under PT 105-513-SI failed with a piece exposure of approximately 1550 MWD/T. This exposure should be compared to the recent solid enriched slug failure that occurred at 650 MWD/T exposure. The charging pattern consisted of 13 solid aluminum pieces to near the center of the tube, four enriched cored slugs, and 20 standard uranium pieces. The presence of solid aluminum increases the local flux, but this may not be sufficient to change the slug power significantly. Weasel readings taken of the down-stream end of the slug were about 7 per cent higher than the upstream end.

Irradiation Behavior of 25 M Metal - During June all the 25M metal was discharged from the piles. The overall rupture rate of 25M metal was 0.0293 as compared to 0.0034 for Group 10 and 11, triple-dip, eight-inch material. A total of 35 ruptures occurred in approximately 750 tubes. Thirteen of these were at exposures greater than 635 MWD/T.

Failures in Non-Uranium Loadings - In June 7-J slugs and in July 6-J slugs (Al-U^{235}) ruptured and were discharged from DR Pile. The alarming increase in J ruptures may be partially explained by the increase in tube powers. J-slugs which were canned prior to the middle of March, as were all these recent ruptures, were canned in thin wall cans which had been stored in 300 Area for an extended period. The J-slugs canned in thick walled cans after the middle of March have suffered no ruptures.

Irradiation of New Fuel Slugs

Cored Slugs - Production Test 105-570-A - This production test authorizes the irradiation to failure of two tubes of cored uranium lead dip slugs and two of standard control slugs at both high and lower powers. Four tubes were charged at C Pile and four will be charged at F.

Mechanically Bonded Slugs - Point Pressure Closure - Production Test 105-575-A - Two tubes each containing two four-inch mechanically bonded, point pressure welded slugs centered with normal uranium pieces were charged at D Pile. These pieces are being irradiated for metallurgical examination and are scheduled for 200 and 600 MWD/T exposure.

Powder Metallurgy Slugs - Production Test 105-576-A - A production test authorization for the exposure of one tube of slugs and a standard control tube to rupture at C Pile and of about a thousand slugs to normal exposure at F is circulating for approval.

Unbonded Slugs - Production Test 105-578-A - A production test authorization for the irradiation to failure of tubes containing "C" Process canned solid and cored uranium slugs, and nickel plated "C" Process canned solid uranium pieces is circulating for approval.

Hot Press Canned Slugs - Production Test 105-577-A - A production test authorization is circulating for approval. Solid slugs with fusion and diffusion welds, cored slugs with fusion weld and control slugs are described.

Unbonded Slugs - Point Pressure Closure - Production Test 105-580-A - A production test authorization for the irradiation of unbonded slugs with point pressure closure has been prepared in rough draft form. Two or four four-inch pieces per tube, spaced with normal slugs, are to be irradiated for metallurgical examination to 200, 400 and 675 MWD/T. One tube containing 4 cored pieces and 4 solid pieces is planned for irradiation to failure.

Investigation of Rupture Mechanism

Thermal Cycling of Slugs - Production Test 105-566-A - Enriched uranium slugs in the fringe of H Pile have been thermally cycled by changes in control rod position. Because of the enrichment, slug powers are comparable to those in central tubes. The slugs have operated successfully for three and a half months and have been subjected to over 500 cycles. Core temperature has varied from a maximum of 300-350 C to a minimum of 175-200 C. The test will be discontinued and the enriched slugs discharged at the next outage.

Manufacture of Other Products

Preliminary Irradiation of J-9 Columns - Production Test 105-567-A - Thirteen tubes containing 19 alternate J and thorium pieces have operated without incident at H Pile since 3-14-54. Current tube exposure is about 45-50 MWD. The planned discharge of one tube for inspection has been postponed from July to early August.

P-10 Irradiation at C Pile - Production Test 105-562-A - The ability of present fuel and target pieces to operate successfully at high powers is being investigated at C Pile. Sixty tubes have been exposed since the middle of February; forty contain hot pressed fuel slugs, the balance being cold canned or Al-Si bonded. One tube was pushed as a suspect rupture but the first inspection did not detect evidence of slug failure. The present exposure is about 80 MWD/tube. Weight loss corrosion data on three tubes discharged in June appear to be on the low side but are not inconsistent with predictions.

Quantity Irradiation of J-Q Columns - Production Test 105-579-A - This production test authorization is circulating for signature. It covers the charging of a total of about 400 J-Q columns at medium and high powers. Tube exposures of 100 and 200 MWD are planned, the delivery schedule requires charging of lower power tubes during August and it is tentatively planned that 160 tubes will be charged during the next outage of H Pile.

Pile Studies

Enrichment Analysis - "An Economic Analysis of Enrichment" was published as HW-32364. Three specific cases are covered, H Pile enrichment in early 1953, H Pile in early 1954 and the calculated case for the recent enrichment of C Pile. Costs of the incremental production range from about breakeven to approximately half the cost if the pile had remained unenriched.

Thoria Feasibility Study - The results of a study investigating the possibility of substituting thoria for thorium in the production of U-233 are reported in HW-32207. It was concluded that the brittle thoria slugs could be expected to fail under pile irradiation.

The use of thoria pellets in a U-235 - aluminum alloy appears attractive since the conversion ratio can be increased, satisfactory heat transfer is assured and ductility is not a problem. Cost savings compared to low g/T plutonium are possible but only when the alloy is reprocessed on site.

Enriched Uranium - Thorium Metal Irradiation - A study was made of the use of enriched uranium and thorium as an alternated tube loading charge for Pu and U-233 production. Such a loading does not appear economically attractive where the products of irradiation are low g/T Pu and U-233 due to the high processing costs entailed with low discharge exposures.

Where the products of irradiation are high g/T Pu and U-233, an alternated tube loading of enriched metal and uranium is much more attractive. In this irradiation the cost of the U-233 approaches the cost of low g/T Pu for some levels of uranium enrichment. This charging scheme would seem to be a promising candidate for dual-purpose irradiations since the discharge exposures could be 2000-3000 MWD/T without sacrificing product quality.

Enriched Uranium - Depleted Uranium Irradiation - The study exploring alternated enriched-depleted uranium irradiation schemes is near completion. The following advantages seem possible using this type of charging pattern:

1. Decreased metal requirements
2. Increased product yields per pound of normal uranium
3. Reduced production costs
4. Reduced pile enrichment costs
5. Decreased cascade processing

Much work will have to be done before such a scheme could be effected. Some of the more apparent problems are:

1. Determine the variation of product isotope ratios for cored enriched metal with exposure and levels of enrichment.
2. Determine whether enriched uranium can be separated in facilities.
3. Adopt for routine production a method for coring fuel elements.
4. Explore reactivity cycles and irradiation problems.

PILE PHYSICS

K Pile Startup Planning

Planning of test procedures and material requirements for the K Pile startup tests has proceeded during the month on the basis of performing the entire experimental program in the KW Pile. Test hole thimble requirements for temporary startup instrumentation have been ascertained. Various inks and stains have been considered for use in marking reject slugs which will be subjected to heating as well as moisture. Because of the very large number of foils required to take several flux traverses, the Experimental Physics Sub-Unit is investigating methods for taking chamber traverses. The Mechanical Development Sub-Unit is working to develop a method for monitoring mechanically the expansion of process tubes during the dry temperature coefficient test; the central tube will be monitored both thermally and mechanically to provide a check on the calculated thermal expansion. The loading pattern has been shifted vertically so that it is centered on the horizontal rod pattern rather than the exact pile center line.

Pile Safety Studies

The relation between power level and time while the pile is gaining reactivity at a known rate is of interest in specifying both rod withdrawal rates and safety system response times. Calculations have been made according to the method outlined in WAPD-13 for control withdrawal rates of 9.4 in per second and 14 in per second; a third calculation is underway assuming a withdrawal rate of 7 in per second. A study is currently underway within Advanced Technology to establish the degree of certainty of this method in cases using Hanford pile constants.

Initial calculations for estimating the excursion which would result from water loss at full level have been carried out in conjunction with Heat Transfer personnel. Using the cold pile effect of water loss, the most limiting case which would occur in case of water loss soon after startup to full level but with cold graphite, it is calculated that the pile would go prompt critical in the order of a half second and a large power excursion would be inevitable. The more realistic case in which the hot pile graphite reactivity effect goes from positive to negative following water loss will be considered next.

Process Specification Studies

Recommendations for K Pile nuclear safety requirements were forwarded to the Process Technology Sub-Unit. Discussion of those features of the K Piles which differ from the present piles includes rates of VSR withdrawal and Ball 3X removal, necessity for protection by Ball 3X automatic trips during operation, and total rod and Ball 3X control requirements. Certain modifications have been recommended in the startup specifications for existing piles to permit more flexible operation. These changes are concerned largely with defining certain startup conditions under which the vertical safety system may be withdrawn safely as a unit rather than at a controlled rate and defining safe horizontal rod withdrawal rates and initial withdrawal configurations.

Information obtained during an Oak Ridge visit concerning critical mass experiments on Savannah River enrichment slugs appears more nearly applicable to the case of specifying "C" slug storage requirements than the conservative approach presently used based on "J" slug critical experiments.

[redacted]

Scram Transient Experiment - PT 105-554-A

Results of the single rod scram transients as a function of chamber position carried out in the test pile during the month show qualitative agreement with calculated effects. The rod control strength measured with the chamber at the pile center was approximately 20 per cent greater than that measured with the chamber at the edge of the pile. Discrepancies between the recording systems were small compared to the position effect. Discussions with personnel at other sites which use this technique show that their conditions are enough different that they do not have to worry about such effects. The SIR test mock-up at KAPL (the "PPA") is much smaller with respect to neutron age than the Hanford Reactors, and the chamber position effect is not observed. Scram Transient techniques give consistent results in the Savannah River full scale mock-up (the PDP), apparently because the transient reading is always recorded as the average of a number of chambers.

D Pile Enrichment Study

A special reactivity study is underway in support of the Pile Graphite Sub-Unit's tentative program for running the D Pile at elevated graphite temperatures with high helium gas composition. It appears that if the proposed temperature and gas composition requirements are to be achieved, several kilograms of U-235 in the form of "C" slugs will be required to maintain the current flattening efficiency at the higher specific tube powers.

Product Yield and Quality Calculations

Early measurements of the spontaneous fission rates of low exposure material in the 200 Areas and at Rocky Flats tend to indicate higher neutron counting rates than had been predicted even on the conservative assumption of a neptunium 239 capture cross section equivalent to that of plutonium 239. However, there are several factors which make those results quite tentative: (1) there are discrepancies between the exposure figures associated with product separation and those quoted by Reactor Production Accounting, (2) early data is from relatively few laboratory samples, and (3) some of the initial samples are subject to discrepancies due to former exposure recycle contamination.

Simulated Masonite Burnout - PT 105-548-A

Shield temperature measurements obtained during the fourth stage of masonite removal in the experimental test wells in the DR top shield are listed below:

Layer	% of Original Masonite in layer	Temperature °C
1	3	92
2	6	90
3	25	87
4	50	78
5	75	68
6	100	55

Although the temperature distribution appears quite flat through the first three cycles compared to H Pile side shield data, there is not necessarily a change due to masonite removal; following the Ball 3X installation at the DR Pile, a similar temperature distribution was observed in the experimental magnetite slabs loaded at that time.

Neutron Detection Techniques

Discussions were held with Oak Ridge Health Physics people concerning the equipment and techniques required for fast neutron dosimetry. Because of the difficulties in both counting intermediate neutrons and evaluating their biological effects, assumed tolerance levels around damaged shields may be unduly conservative. Chambers lined with hydrogenous materials and employing a hydrogenous atmosphere to approximate closely biological dose rates have been developed by the Oak Ridge people, and counting circuitry has been developed to bias out gamma background; equipment based on the Oak Ridge development work is now in use at a number of AEC sites.

HEAT TRANSFER

Cooling-by-Boiling Experiments

Cooling-by-boiling tests were performed successfully with an aluminum heater tube in which heat was generated proportional to a cosine curve. The operating conditions were as follows: 570 KW tube power (35 kw/ft maximum), 300 psig rear header pressure, 20 C inlet water temperature, 8.5 gpm flow rate and 11 per cent exit steam quality. No thermocouples were available in this tube to detect the imminence of burnout conditions, and therefore no effort was made to determine the minimum flow rate. Rather, the purpose of the test was to lend support to the proposed conditions under which boiling will be permitted in the H Pile loop. Those conditions, as outlined in HW-32460, "Summary of Anticipated Operation Conditions for In-Pile Boiling at H Pile," W. D. Gilbert are: 350 kw tube power (34 kw/ft maximum), 300 psig rear header pressure, 95 C inlet water temperature, 7.7 gpm flow rate, 10 per cent maximum steam quality and 550 psig minimum pump discharge pressure. The H loop tube power will be less than that of the mock-up since the central slugs in the pile tube will be replaced by dummy slugs. However, although test and pile conditions differ, the former conditions are reasonably representative of the latter. The permissible pile conditions are considered to be conservative and it is possible that they will be relaxed before the in-pile boiling occurs.

Correlation of Cooling-by-Boiling Results

It has been proposed, based on boiling data from ANL and NACA, that steam quality at burnout might be correlated with tube inlet water velocity by a single, straight line on ln-ln paper. Based on such a plot, outlet qualities of more than about 10 per cent could not be permitted for tube powers in the range of 750 - 1000 kw. To evaluate the validity of this plot, data from the mock-up were analyzed. It was found that the mock-up data indicate permissible qualities about 75 per cent higher than those allowed by the plot. In addition, the mock-up data indicate strongly that permissible quality may be raised still further for improved operation conditions. For example, at a velocity of 5 ft. per second, the plot indicates a permissible quality of 15 per cent; mock-up data indicate qualities of 22 and 28 per cent for 125 and 225 psi static pressure conditions, respectively; and, extrapolation of these latter data indicates that qualities of 50 per cent or more might be permitted for systems pressures of 1000 psi. Since permissible qualities are expected to depend upon specific power, static pressure, sub-cooling and other variables, there is a good chance that practical operating conditions may be found which will permit outlet qualities in the range of 30-50 per cent

for C Pile tube geometry at power levels on the order of 750 to 1000 kw. Practical changes in slug geometry might then permit raising this 30 - 50 percent quality to 60 - 90 per cent.

Panellit Reliability

An investigation was made to determine the number of inoperable pile panellit gages which are discovered at each pile each month. It was found that there have effectively been no inoperable gages discovered at C Pile for six months or more. A discussion of this study is given in HW-32491, "Investigation of Panellit System Reliability," H.H. Greenfield, July 20, 1954. A recommendation has also been made that the subject of dual panellit protection at each pile be re-opened for discussion.

Hydraulics Laboratory Studies

A report, HW-32470, "Effect of Screen Plugging on K Pile Tube Venturi Flow Meter," H.H. Greenfield, July 19, 1954 was issued. The effect of various amounts of screen plugging on the pressure drop-flow characteristics of the venturi assembly are discussed.

Tests were completed on the pressure drop-flow characteristics of internally and externally cooled slugs in the C and K type process tubes. The hole diameters investigated were 1/4", 3/8", and 1/2". The outside diameters of the slugs were 1.44". The experimentally determined characteristics of the charges correlated well with the analytical predictions.

Tests on the effect of orientation of the flat-blade-shaped resistance thermocouple well on pressure loss in the K outlet fittings were performed. It was found that orientation was unimportant.

The 189-D Hydraulics Laboratory Project has been completed.

Fuel Element Calculations

At the request of Fuel Technology Personnel, calculations were made to compare the temperatures in a conventional slug with those which would exist in a laminated slug. The latter would consist of alternate wafers of uranium and aluminum. It was approximated that temperature drops in the latter type would be on the order of 70 per cent of those in a conventional slug.

Experimental Fuel Element Studies

A slug having two thermocouples on the surface and one on the end cap has been fabricated and successfully tested. It is planned to install this slug in a pile soon.

MTR Exposure

Equations were derived and calculations were made to aid Applied Research personnel in the design of uranium tensile specimens for MTR exposure. The results are

reported in HW-32347, "Temperature Calculations to Facilitate the Design of Uranium Specimens for MTR Exposure," S.R. Fields, July 7, 1954.

Pile Safety Studies

As part of a Pile Engineering study of pile safety, an analysis has been made of the probable time required to lose the water from a process tube due to boiling following loss of header pressure. These results will aid in defining reactivity excursions and thus pile heat generation for an assumed case of loss of a riser. In addition, preliminary experimental tests were performed to measure this time. The results of the experimental work are contained in HW-32469, "Results of Preliminary Tests on Coolant Ejection Rate Following Simulated Riser Failure," K.G. Toyoda, July 19, 1954.

Calculations are also essentially complete on the thermal effects of an undetected loss of water from a single process tube during pile operation. These are being expanded to include the thermal effects to a single process tube when a scram follows the loss of water to the tube.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

Bids from vendors on the spectrometer unit portion of CG-578 and 579, the projects to replace the existing beta systems at all areas except KE and KW with gamma slug rupture detectors, were reviewed. The technical review indicated that the Radiation Counter Laboratory bid of about $100,000 for forty-one spectrometer units was the lowest among those which were based on meeting specifications for an industrial type installation. The prototype gamma monitor at H Pile continued to operate satisfactorily.

The development of a sensitive gamma survey meter for use in isolating the tube containing a rupture following crossheader identification by the gamma monitor has been completed and a report discussing the development is being prepared. This instrument has more than ten times the sensitivity of present methods used in tube identification and is easily handled in a survey application.

The development of the "Gammascan" system, a system comprised of crystal, photomultiplier and collimator assemblies mounted at lattice unit intervals across the rear elevator, has progressed satisfactorily. The "Gammascan" system is being designed to localize sources of high gamma activity on the rear face; the signals from the forty-six horizontally distributed detector units are rapidly scanned and displayed on an oscilloscope to yield the horizontal scan and the vertical movement of the elevator provides the vertical scan. Tests have been completed on a mercury jet switch to provide rapid scanning. The bulk of the circuitry has been designed around 931-A photomultiplier and plastic scintillators; component fabrication will be initiated next month. This system is expected to pin-point "lost slugs" and isolate tubes containing a rupture with some success during an outage and perhaps in some cases during reactor operation. Document HW-32402, "Possible Methods of Locating Hot Slugs on the Reactor Rear Face," R.S. Paul, was issued to present current thinking on this problem.

Neutron Economy Studies

Experimental determinations of the power generation in E metal (1.75 weight per cent U-235 in uranium) have been completed as based on neutron flux distributions measured in a Test Pile loading. These traverses show that the ratio of the power generation rates in "E" metal relative to natural uranium in the same unperturbed flux is 1.75. Pertinent constants derived from the neutron distribution - relative to unity at the slug center-include i) neutron density at slug surface ϕ_s (E) = 2.234, and ii) average neutron density in E metal slug $\bar{\phi}$ (E) = 1.484. These values include all fissions and yield a disadvantage factor ($\phi_s / \bar{\phi}$) of 1.506 for fissions in E metal.

Neutron traverses have been analyzed to extract the fraction of the fissions in U-235 which occur at energies above 0.3 ev, i.e. at cadmium cutoff. In the case of "J" metal about 8 per cent of the fissions are from epi-cadmium neutrons. This result is in agreement with Test Pile reactivity measurements which also show that about 8 per cent of U-235 fissions occur above the cadmium cutoff at 0.3 ev. This effect must be taken into account in certain types of lattice studies.

A measurement of the local increase in neutron density within a natural uranium slug due to end caps or atypical adjacent slug loadings was completed. In the case of an aluminum dummy slug loaded adjacent to natural uranium the neutron density at the uranium-aluminum interface is 1.7 times that at the center of the uranium slug - all measurements were made on the slug centerline. Similar measurements made at a uranium-lead cadmium slug interface demonstrated the neutron density at the interface in this case to be 0.95 times that in the center of the uranium slug. These data demonstrate that thick endcaps or adjacent low cross section material may set up substantial power gradients at the slug ends and must be considered in slug and/or pile loading designs. This result is in substantial agreement with that expected from theoretical considerations.

The metal temperature coefficients of reactivity were measured for several slug types. These data are now being reduced to yield numerical values for the coefficients.

Instrument Development

The modifications to the low level period trip system for the K piles, which were required to adapt the system to Hanford circuitry, have been completed and the systems returned for installation. The high level period trip system has also been modified and tests on the modified version indicate that the system as presently designed is satisfactory. About one-third of the electronics was eliminated and replaced with a simplified relay system. The delay in response for the entire system ranges from 0.4 seconds for one second periods to 3 seconds for fifteen second periods. A review of the safety systems for the K Piles reveal that the level trips are activated through the mechanical movements of the associated signal recorder pen drives. This latter feature is undesirable for numerous reasons and methods of accomplishing the level trip electrically are being developed.

The electronic components for the instrument system to monitor the neutron multiplication in the sub-critical pile have been received. The electrodes for the U-235 fission chamber will be shipped by Oak Ridge as soon as the U-235 is allocated. The allocation request was submitted two months ago and has not yet been approved; this delay may retard the on-pile installation of this system. Prior to the delay it was

expected that this system could be installed in DR Pile during September. The design and fabrication of the test facility is proceeding jointly with Mechanical Development and is on schedule.

Some consideration has been given instrumentation problems associated with KW Pile startup. Included are safety circuit modifications that will need to be made to accomplish the startup program and the development of HF_3 counters to replace foil traverses in augmentation length determinations.

Outlet Water Temperature Monitoring Facilities

Development Test 105-564-A, "Temperature Monitor Prototype Test," was completed during the month. This test was directed toward obtaining on-pile performance data for a twelve point prototype of the K Pile temperature monitor system in which the outlet water temperature of every tube is monitored continuously as part of the safety system. Several instances of malfunction were isolated in the prototype since the interim report, HW-31890, "Interim Report, Development Test 105-564-A, - Temperature Monitor Prototype Test," D.E. Stephens, was issued include i) three of twelve thermal resistance elements are inoperative, ii) some drift in calibration was observed and iii) several of the meters do not perform properly in the safety circuit activation function. These performance data will be discussed in detail in a final report on this test.

A twelve point prototype system will be modified at H Pile to yield performance data on a temperature monitoring system for existing piles which is designed to supplement the panallit system in a "trip-before-boiling" mode of pile operation. It is believed that substantial protection can be provided by installing temperature monitors on one tube in each block of nine, i.e. about 200 points per pile would be continuously monitored in the safety system. In the event of power excursions, either local or general, it appears that this one-in-nine monitoring frequency will provide most of the protection afforded by monitoring the outlet water temperatures of every tube but at a cost of about $40,000 per pile. High quality components are being placed in the twelve point prototype system, the resistance elements distributed on a one-in-nine tube pattern, and the system will operate continuously to give on-pile experience.

Reactor Safety Fuse Development - North American Aviation

Three prototype safety fuse elements were tested to yield the degree of reactor control realized as compressed $B_{10}F_3$ was expanded from a small volume at one end of a slug can into the overall can volume. The overall reactivity absorbed in the expanded state was increased by less than a factor of three over the compressed state in each case. As such the elements would be quite expensive to employ and North American personnel are redesigning the elements to achieve more control per element. HW-32273, "Hanford Test Pile Measurements in Support of NAA Safety Fuse Development," M.V. Davis and H.A. Fowler, was issued describing the measurements of reactivity and neutron distribution on simulated elements to provide data upon which to base more optimum designs.

Test Pile - Routine Tests

The reactivity of bare slugs tested continued to be low. The recent quality of the uranium eggs continued to improve following a period of poor quality. Six lots of

machined billet eggs from Mallinckrodt yielded TDS values ranging from 12 to 13 while four lots of machined eggs from Fernald yielded TDS values ringing from 14 to 15.

Test Pile - Special Tests

The change in 105 pile reactivity which would accompany the melting of all uranium while containing it in the graphite tube blocks was measured to be a loss of about one-half per cent k. This idealized result ignores the fate of the aluminum and gaseous fission products, i.e. it is the result of the change in geometry of the fuel element alone. This work is being extended to a range of fuel elements in support of Hanford pile safety studies.

A group of nickel plated slugs were tested in the Test Pile to ascertain the reactivity effect on a 105 pile loading. These slugs were 1.380 inches in diameter, coated with one mil of nickel and canned in a thin wall aluminum can. The increased uranium diameter and reduced aluminum can thickness nearly compensated the parasitic capture in nickel; about 40 inhours would be lost in a 105 pile fully loaded with this material.

Physical Constants Test Reactor

Bids for the construction of the building to house the Physical Constants Test Reactor and Thermal Test Reactor were received. Several of the lump sum contractor bids were under the total monies available for this job. It is expected that the bid will be awarded and construction begun next month.

The fabrication of the mechanical components has begun. Essentially all prototype testing has been completed except for certain instrument systems and these are being tested as the components arrive onsite. The Reactor Hazards Report to the Advisory Committee on Reactor Safeguards has been delayed while the feasibility of providing fuel elements of a new design is developed - in certain limiting cases an advanced fuel element design will moderate the severity of a "burst" and will probably be adopted if economic and metallurgical considerations permit. Facilities for machining the graphite are being activated in 2101 Building and machining should start next month.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

Development of equipment for segmentally discharging process tubes continued during the month. Negotiations are being made for a Development Contract with a vendor to supply a full length expanding spline. Work has also been directed toward the development of a plastic-coated nylon fabric expanding spline. A guide for handling the spline and introducing flushing water was designed and is being fabricated.

Development of a simple ruptured slug segregating device was considered during the month with several possible approaches to the problem being evaluated. At the present time the possibility of marking the slugs as they come out of the process tube is being considered and will be tested first.

Horizontal Rod Studies

The following outline presents the status of the horizontal rod conversion program:

Laboratory work - complete.
B Pile - The new rod continued to operate satisfactorily. Motion pictures were taken of the rod during a recent shutdown to facilitate examination of the rod surface. The films are expected to be available early in August.
H Pile - Continued satisfactory operation. Maximum skin temperature yet to exceed 95 C.
F Pile - The half-rod has been ready for approximately one month and is awaiting installation by Maintenance forces.

The ribbed sphincter seal for the C Pile replacement horizontal rods was installed on the "A" rod on 6-14-54. Satisfactory operation has been obtained since that time. The final report on the washer seal that was installed on this rod prior to 6-14-54 has been issued.

Testing of the K horizontal control rods is now essentially complete. A document is being prepared reporting on the results of the test and indicating that the rod design is considered satisfactory.

Vertical Rod Studies

The design test of the K Pile vertical safety rod being performed at the White Bluffs Test Tower continued during the month. Differences in drop time were measured for the rod with and without the gas seal. The gas seal has been found to increase the drop time an average of .03 seconds. After 700 drops of the 1000 drop endurance test it was noted that the tube was becoming scored and the piston and rings were showing signs of wear. After some adjustment further drops were initiated but scoring again became evident. It was at first believed that this trouble resulted from foreign matter dropping into the top of the tube; however, there are now indications that the 3X tie-in switch is the source of the trouble. Steps are being taken to correct this and additional drops will be made.

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

The final report on Design Test No. 31 covering the development of a gas seal for the K Pile safety rods is being issued as document HW-32519 and discusses the test work on the segmented ring metallic seal and the development of the washer seal.

Supplemental Control

Test work to evaluate the feasibility of graphite wetting as part of the disaster control system was performed during the month. Results indicate that clearances of approximately 5 mils between adjacent filler block layers are required for flow rates sufficient to provide adequate cooling. Equipment for the single tube heated mock-up is being assembled. Purchased items have been received and the necessary graphite fabricated.

A re-assessment of disaster control systems in general is being made based on further studies of the problem. The basic conclusions reached are in some respects different

from those previously published. A document is being prepared discussing this re-assessment and will be issued in the near future.

An order was placed during the month for the fabrication of several nozzle cap seals to be used with the poison splines. Test work has indicated that it is possible to fabricate a spline by filling thin wall aluminum tubing with boron powder and pressing to shape. The design of the shielding cask to be used for withdrawing splines from the pile has been started.

The equipment being used for development of the BF_3 supplementary control system is being set up in the 189-D laboratory. A test program based on the recommendations outlined in document HW-30598 has been drawn up and schedules established.

Process Tube Assembly and Piping

Flexure testing of the approved 105-C outlet connectors was started on the first specimens received from the vendor. Testing indicates the connector to be satisfactory even though the surface appears to be rather severely pitted from the pickling operation.

Document HW-32281 was issued during the month and reports the results of the irradiation of "O" rings that were incorporated in the design of the sliding joint outlet connector for C Pile. The "O" rings were found to be completely satisfactory under the accelerated exposure conditions of this test.

Drawings of the flexible connector testing facility were corrected and revised during the month and submitted to the shop for estimate.

Work continued on the program to determine maximum allowable tube inlet pressure at a reduced level during the month. Corrosion samples were pressure tested and examined. A summary of past work is being assembled.

The equipment for measuring the axial force a slug column exerts on the rear cap, and for measuring the differential expansion of a slug column in a process tube was installed in tube 3490-F on July 8. The load measuring equipment operated satisfactorily for a short time before going out of adjustment. The loads recorded agree quite well with calculated values. The motion measuring equipment was not properly adjusted when installed and will be corrected during the next shutdown.

Materials Testing Reactor Test Facility

The Materials Testing Reactor test facility has now been accepted for insertion in the Arco installation. Present schedules indicate the first "A" piece will be charged during the shutdown starting July 28.

Physical Constants Testing Reactor

Drawings for the horizontal control - safety rods have been revised and a work order issued for the fabrication of eight units. The vertical safety disc drawings are undergoing revision. Site decontamination and cleanup in preparation for the 305-B Building construction have been started by Minor Construction.

Other Engineering Development Work

Assistance continued during the month on the design of the rear face television system for 105-B. The project proposal has now been approved and the work will be followed as the installation progresses.

The design of the mechanical portion of the sub-critical monitor is approximately complete. Equipment has been ordered and fabrication will commence in the near future. The design is such as to permit remote positioning of the sensing element, with the drive and associated equipment arranged to permit application on a standard process tube.

Assistance continued during the month on the development of under-water equipment for irradiated process tube examination work. Design has been started on a special saw to assist in the removal of slugs which are stuck in a section of process tube.

Physical tests are now complete on the series of rubber formulations exposed during recent sample irradiation. A report is being prepared discussing the results of tests to date. A new series of tests is being started which will include some special duPont formulations as well as variations of the best formulas previously tested.

WATER PLANT DEVELOPMENT

Flow Laboratory

In-pile tests of reduced pH, reduced dichromate and unfiltered water continued. All results obtained to date predict successful completion of the program to reduce process water pH to 7.0 and dichromate to 0.2 ppm. Mock-up tests under these water quality conditions at 120 C have now operated for ten weeks. Aluminum corrosion rates are about one-half of those experienced in process water under similar conditions. Two of the five in-pile tubes are operating with unfiltered water containing 5.0 ppm dichromate at 7.0 pH. One of these tubes was discharged as a suspected rupture. Examination of the slugs showed them to be in good condition; radiochemical analyses confirmed the absence of a rupture. The tube was recharged with weighed metal.

Construction of 1706-KE Water Studies Semi-Works proceeded. The building is complete structurally and installation of pumps and piping is underway. Overall completion is estimated at 50 per cent.

Plant Tests

The high filter rate test at 183-D was concluded. The test operated throughout the difficult water treatment months and demonstrated that the filter rates anticipated after the Water Plant Expansion project are definitely feasible. Revision of process specifications is in progress to permit acid addition with the coagulant and to broaden the range of neutralization of activated silica. These changes were developed during the high rate test to lengthen filter run times and increase operating efficiency.

Operation of the low pH (7.3) test at F Pile is now in its fourth month. No slug corrosion data have been obtained to date; visual inspection shows no tendency toward pitting attack in the front tube sections.

The reduced dichromate test was initiated at 100-D. Dichromate concentration was reduced from 2.0 to 0.5 ppm in the process water to one-half of the pile. The near side of the pile is supplied with normal process water as a control.

Recirculation Studies

The in-pile loop at H Pile was shut down for installation of additional flow and pressure controlling devices in preparation for boiling tests. A series of aluminum corrosion tests in the isothermal mock-up loop at 175 C was completed after 62 days exposure in deionized water. The slugs exhibited a weight gain during the test of 0.007 mg/cm^2/day. The use of electrolytic de-scaling was found necessary to remove the tenacious film formed at high temperatures. An investigation was made to determine techniques and equipment needed for gas analysis in high purity water; the necessary apparatus is being fabricated in the glass shop. A defective pipe in the 300 C mock-up loop ruptured during testing; repair of the system is in progress. Procurement of three additional mock-up loops progressed slowly.

Studies of pumping and pressure requirements of the four KER in-pile loops were made. An investigation was undertaken of available pumps for high temperature recirculation application. Design council approval of the scope of KER recirculation facility was obtained; detailed design is progressing.

Boiling Studies

Slugs exposed in the recirculation mock-up boiling loop showed low corrosion rates after five weeks' exposure. Test conditions were 85 C liquid phase water at the inlet and 175 C, 10 per cent quality steam at the outlet. Tests in steam-water mixtures showed little effect of steam quality or velocity on aluminum corrosion; temperature and water quality appear to be the primary variables.

Modification of the H Loop for in-pile boiling tests progressed with the installation of a back-pressure control station and additional instrumentation. A final rough draft of the boiling production test was prepared for approval.

PILE COOLANT STUDIES

Production Tests

Authorization has been obtained to operate the PT 105-519-E tubes at outlet water temperatures up to 120 C. Maximum and average outlet water temperatures during the past month have been 113 and 105 C, respectively. Higher outlet water temperatures will be reached as the river water temperature continues to rise.

PT 105-542-E, "Reduction of the Amount of Dichromate Added to Pile Cooling Water," was started on June 30, 1954, at D Pile. The near side of D Pile is operating with water containing the normal concentration (2 ppm) of sodium dichromate, while the far side is operating with water containing 0.5 ppm sodium dichromate.

Tube Examination

Six pile process tubes were examined during the month. Except for tube 1794-C no new or unusual forms of attack were noted on the tubes. Tube 1794-C had contained C metal and was removed as a leaker from C Pile on July 16, 1954. A number

of "thinned" areas at the top of the tube at slug junctions were found about 25 feet from the rear Van Stone flange. Thinned areas such as found in this tube had never been observed in other process tubes examined. The hole in the tube was found in one of these thinned areas.

An inspection of the front sections of process tubes was made at D Pile on July 22, 1954. Seven control tubes for the low dichromate production test (PT 105-542-E) were examined - three of which were on the near side (2.0 ppm sodium dichromate) and four were on the far side (0.5 ppm sodium dichromate). No corrosion product was observed on any of the tubes.

Laboratory Corrosion Studies

The weighed tube mock-up to obtain corrosion rates on 72-S and 63-S aluminum was discharged after 90 days operation at 90 and 105 C. No appreciable difference was found between the corrosion rates of these two alloys. Tests are continuing in process water at pH 7.65 and 7.3.

Operation of the Minitube mock-up in the 100-D powerhouse with softened water containing 2 ppm sodium dichromate continued during the month. Corrosion rate data are being obtained from this mock-up on 2-S aluminum at temperatures up to 175 C. Excessive pitting attack has been observed at temperatures about 135 C. Plans have been made to reduce the pH of the softened water to 7.3 in an effort to reduce the corrosivity of the water.

The test to determine the film and scale forming properties of pH 7.3 process water was completed during the month. In this test water at pH 7.3 containing 0.2 ppm sodium dichromate and at a temperature of 120 C was fed to a steam-heated inner tube mock-up. This mock-up, consisting of an inner tube (having the same diameter as a slug) in a process tube, was used to heat the water to temperatures between 130 and 150 C. Upon discharging the inner tube it was found that after 2-1/2 months operation very little scale had formed. The inner tube appeared to be in good condition with only a slight amount of grooving on the surface. A similar tube exposed to pH 7.65 process water exhibited severe grooving after a shorter exposure.

Experiments to determine the feasibility of converting the present 183 filters to combination filter-softeners show that 24 inch Zeo-Karb and 6 inch sand will yield zero turbidity, 1-2 ppm total hardness water at 6 gpm/ft2 for only two hours before the flow diminishes. If the flow is interrupted periodically during the run, the total run time can be extended to about 5 hours. The low capacity is probably due to the small particle size of the commercial Zeo-Karb.

Equipment has been set up to determine the temperature of scale formation in water containing various amounts of total hardness.

To simulate a zirconium clad slug in a 72-S clad aluminum tube, a zirconium sleeve was placed in a process tube. This tube operated at 105 C for 45 days. The corrosion rate of the 72-S cladding was 0.5 mg/cm^2/day.

A zirconium tube containing 2-S aluminum slugsand zirconium slugs was exposed to pH 7.3 process water at temperatures of 130, 140 and 150 C for two weeks. Preliminary data from this tube show that an aluminum-zirconium system, from corrosion

considerations is feasible. To further study the aluminum-zirconium system an extended time test at 140 C in pH 7.3 process water has been started.

Two mechanically bonded slugs (with fusion-welded can closures) have been tested in the 105-D Flow Laboratory. The first slug had a small hole drilled through the side of the can. After 36 hours exposure in the glass tube mock-up to raw Columbia River water at 120 C, this slug developed bulges over five to ten per cent of its surface but remote from the hole. Markings on the surface indicated that the water moved on narrow discrete paths, no general attack occurring. The "necking" of the can wall around two of the bulges was severe enough to produce small cracks in the can, providing new points of water entry. The second slug, with a hole drilled through the weld bead, operating under the same conditions developed one appreciable bulge after the first 36 hours. This slug was finally discharged after 336 hours on test. The slug surface at this time showed several small pimples and a number of paths, but no bulges comparable to those found on the first slug. Both of these specimens will be examined in detail by the Metallurgy Unit.

A new test has been started under conditions similar to those stated above using Al-Si production slugs, mechanically bonded slugs, and unbonded slugs.

GRAPHITE STUDIES

Pile Core Sampling Device

The modified core borer, designed to extract cores from the pile stacking, has been tested in the F Pile. The newly designed saw cut the irradiated pile graphite easily. Because of mechanical failure, only a part of one core was retrieved and the coring device was damaged during removal from the pile. Improvement in the design has been completed and the device is in the shop for fabrication of new parts. The new design should provide greater strength and increased saw travel, thereby increasing the ease with which cores may be removed from the pile.

Physical Properties of Graphite Produced with Additive of a Carbon Black

Samples were prepared by the National Carbon Company under the G-3 contract which contained various amounts of a particular carbon black added to the mixture of coke and pitch. Physical property measurements on these graphites indicate:

1. Density increases with increasing percentage of carbon black.

2. Thermal conductivity both before and after cold test hole irradiation decreases with increasing per cent carbon black.

3. Graphite purity decreases with increasing per cent carbon black.

4. Physical distortion appears to be at a maximum at a density of about 1.7 gms/cc (15 per cent carbon black). The distortion of graphite with a density of 1.83 (30 per cent carbon black) was similar to the distortion of a graphite of density 1.55 which had no carbon black.

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Effect of Graphitization Temperature on Physical Distortion of Graphite

Molded samples of Texas coke and Standard pitch produced at Battelle Memorial Institute and graphitized to various temperatures have been irradiated in water-cooled Hanford test facilities. The temperatures of graphitization attained were

exposure period of 81.5 days. Because of difficulties encountered on the discharge, only the five rear sample boats could be removed at this time. Weight losses have been measured and the rates of burnout calculated from these losses are tabulated below.

Position in Feet Downstream from ℄ of Graphite Stack	Average Burnout Rate in %/1000 Days	Estimated Exposure Temperature in °C
5'6"	0.22	425 ± 25
7'4"	0.23	380 ± 25
9'2"	0.29	290 ± 25
11'0"	0.24	190 ± 25
12'10"	0.14	125 ± 25

The exposure temperatures were estimated from readings taken on the two nearest thermocouple stringers. The rates at 5'6" and 7'4" may be somewhat low as a result of the proximity of the "A" horizontal control rod to these two positions. The highest observed rate therefore occurs at 9'2". It cannot be determined if this is the maximum until results are obtained on some of the samples which still remain in the channel. While burnout rates on the fringe zone samples are comparable to those obtained on samples exposed in the fringe to mixtures of carbon dioxide and helium, the results for the central zone samples indicate that the burnout rate is appreciably lower than that which would occur if the samples were exposed to a mixture of carbon dioxide and helium. This can be seen by comparing the above results with those for samples with a diameter of 0.425 inch reported in the preceeding section on burnout monitoring. It is hoped that some of the samples remaining in the channel can be recovered in order to confirm these conclusions.

Exposure of Full Sized Graphite Bars - PT 105-521-E

Dimensional measurements have been made on two of the five bars removed from the G test hole in C Pile on June 18. The measurements indicate an average contraction on the order of 0.001 inch in both transverse and parallel directions. Measurements on the remaining bars will be made when their radiation levels are not restrictive. Samples have been submitted to the Experimental Physics Sub-Unit for the analysis of impurity activities by means of the gamma ray spectrometer. Surface areas and C_o spacings will be measured to determine the extent of oxidation and neutron damage respectively.

Graphite Plates from Horizontal Rod Channels

Eighteen more graphite plates were removed from the far side of the No. 8 horizontal control rod channel at F Pile on July 8. Because the past movements of the control rod should have had little, if any, effect on this graphite or the radiation flux around it, measurements of the extent of oxidation and other physical properties should prove interesting. These results will be reported in the near future.

Surface Measurements

Surface area measurements have been made on samples of the C Test Hole stringer which was removed from F Pile in February 1951. By comparing these surface areas to those of samples oxidized in the piles to a known extent, the extent of oxidation of the stringer samples was estimated. The maximum extent of oxidation of these samples was found to be about 0.3 per cent.

SPECIAL IRRADIATIONS

Slugs for measuring the energy release in a single process channel (H00-270) were charged in tube 0777 at C Pile on July 4, 1954. All monitoring equipment for measuring the power generation in this channel is working satisfactorily. An internal consistency of better than one-half per cent is expected for the three separate methods of measuring total power. The equilibrium channel power level is approximately 800 KW. Making allowances for shutdowns, it is estimated that the desired exposure of 600 megawatt days per ton will be achieved in less than four months at this rate.

Out-of-pile studies with the eighth in a series of creep studies (KAPL-105-8) have been completed. This eighth assembly which contains nickel creep specimens will be charged in F Pile August 2.

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A representative for Westinghouse set up the apparatus for and ran a series of gas analyses on the gases collecting in the surge tank. The effect of a varying hydrogen concentration on oxygen concentration was studied. Analyses of the data are not complete.

Design specifications for a new high pressure, high temperature loop for KAPL are being prepared. This loop will be installed on the X-1 level at H Pile following the removal of the existing loop. It is intended that specifications for all piping components will serve as a basis for letting a contract for the fabrication for the piping of the loop to an outside vendor.

Fabrication and procurement of equipment for measuring the in-pile reaction between selected mixtures of gases and slug jacket materials is proceeding as scheduled (HAPO-105). The production test has been written and is now being routed for signatures.

The experimental arrangement for the irradiation of zirconium and zircalloy-2 process tubes (HAPO-110) is essentially complete. The production test has been prepared in rough draft form and is being circulated to interested parties for comment. Delay in the arrival of the process tubes continues to be the major cause of delay in this in-pile experiment.

The rate of heat generation in 347 stainless steel by pile radiations was measured using a specially designed calorimeter in Snout I at H Pile. Heat generation was found to be approximately three watts per gram in the flattened zone at equilibrium conditions.

Correlation of heat generation with local power generation is in progress.

All apparatus has been fabricated and assembled for studying the in-pile reaction between graphite and nitrogen under controlled conditions. Three separate experimental samples will be charged into H Pile August 5.

The MTR fuel testing facility was charged with fuel elements July 29. This Unit has been given full responsibility for operational and liaison activities relative to this facility.

Information has been received that the fabrication of the pneumatic facility is complete at the vendor's site. A member of this Unit is now attending preliminary testing of this facility.

Satisfactory castings for the nozzles of the K channel experimental facility have been made, thus insuring the installation of these facilities before start-up of the K Piles. Installation of the facility proceeds as scheduled.

Routine samples of gas are being taken weekly from all piles to assist in correlation of graphite burnout with impurities in the pile gas.

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

The recommendation was made by the CA-512-R project representatives that new secondary pump gears be obtained which would allow higher water plant output. The Design Council did not approve this recommendation, but instructed that it be resubmitted January 1, 1955.

The Design Council approved the scope drawings and criteria for the KER Loops.

No action of technical significance was taken on the water plant expansion project during the month.

General

A study has been made of the feasibility, cost, and probable process conditions of a facility for recovery of a portion of the waste heat from one of the K Piles. For a net generating capacity of 50 to 70 MW, the pay-off period may be less than ten years. While not the most economically attractive method of nuclear power utilization, such a facility would provide pilot plant experience at a relatively low capital cost and with very little interference with normal production activities.

Consideration has also been given to the factors having the greatest influence on capital cost in the design of a dual purpose reactor. Plots were prepared relating capital cost to various parameters, as well as unit product cost versus capital cost for a particular range of process conditions.

INVENTIONS

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

DECLASSIFIED

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

G-1552, 1-O

GENERAL ELECTRIC COMPANY

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

HW-32624 DEL

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JULY, 1954

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VISITORS AND TRIPS

G. W. Dunlap, Engineering Servicing Department, Schenectady, and J. L. Michaelson, General Engineering Laboratory, Schenectady, visited F. W. Woodfield and R. G. Geier, July 8, 1954 to discuss engineering problems.

W. Lindsey, AEC - Project Division, Washington, D.C., visited O.F. Hill, July 22, on neutron emission from plutonium.

W. E. Shaw, National Lead Company, Fernald Plant, Cincinnati, Ohio, visited V. R. Cooper, F. W. Woodfield and R. G. Geier, July 26 and 27 to discuss pulse generators.

R. J. Sloat visited the National Lead Company, Fernald Plant, Cincinnati, Ohio, July 1 and 2 for process consultations.

W. A. Burns attended the Gordon Research Conference, New London, New Hampshire, July 26 through 29 to attend instrumentation conference and West Linn Plant, West Linn, Massachusetts, July 30, to discuss instrumentation.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	June	July
Administrative	2	2
Contact - Start-Up Engineering	4	4
Chemical Development	70	74
Plant Processes	49	47
Analytical Laboratories	34	35
Total	159	164

Chemical Development: One Technical Graduate - Rotational was transferred in from Technical Personnel, one Technical Graduate - Rotational was transferred in from Project - Project Auxilliaries, one Engineering Assistant was transferred in from Fuel Technology, two Engineering Assistants were transferred in from Applied Research, two Engineering Assistants were transferred in from Manufacturing - Separations Process, one Junior Engineer was terminated to enter Military Service.

Plant Processes: One Engineer I was transferred in from Fuel Technology, one Chemist was transferred to Applied Research, one Junior Engineer was terminated for Military Service, one Secretary "C" was deactivated - pregnancy leave.

Analytical Laboratories: One Technical Graduate - Rotational was transferred in from Radiological Sciences - Records and Standards

PUREX DEVELOPMENT

Chemical Engineering Development

3 Inch Pulse Column Studies - Seven Purex HA Column studies were made in a dual purpose glass pulse column (3 inch diameter extraction section, 4 inch diameter scrub section), using a "standard" sieve-plate cartridge (stainless steel plates with 1/8 inch holes, 23 per cent free area, 2 inch spacing), with feed derived from mercury catalyzed pilot plant dissolvings of aluminum jacketed "cold" (unirradiated) uranium. The presence of aluminum, mercury, dissolved and

and undissolved silica, and other solids in the forms and concentrations tested did not materially affect the HA Column flooding characteristics or extraction effectiveness, as compared with column performance in the absence of these constituents (Purex Chemical Flowsheet HW #2 conditions). HC Column performance also was normal when the above uranium was stripped from the solvent back into the aqueous phase.

Technical Manual

On July 25 the preparation of the Purex Technical Manual was about 43 per cent complete.

Mechanical Development

Pump Development - The Peerless 4LA (P-5), a four-stage deepwell turbine pump with a 5 foot drive shaft and 5 CSGBF (pile graphite) process solution lubricated sleeve bearings, was given a final inspection after pumping Purex IAX solution at a rate of 38 gal./min. against a 6 foot head for 4056 hours. Operation throughout the test was smooth and quiet and no changes in head capacity characteristics had been observed. The overall condition of the pump was excellent. The maximum of 8 mils diametral wear on the intermediate bowl bearings and the smooth unscored appearance of the bearings indicates that pile graphite is a satisfactory bearing material for this service.

Bearing Development - Six bearing journal combinations were tested on the bearing test machines. The best combination consisted of a gold plated bearing having a gold thickness of 0.003 inch, running against a chrome plated journal.

Instrument Development - Preliminary testing of a George Dahl pneumatically operated control valve was started. Satisfactory operation for 635 hours has been obtained.

All the components of a Brown all-electric flow control system were checked and found to function properly. The system will be installed on a pump test stand for comprehensive testing.

Materials Testing

Nitric Acid Fractionator Corrosion Studies - The semiworks scale nitric acid fractionator consisting of eight single bubble cap trays in a 6 inch i.d. column was operated for 105 hours at a pressure of 110 mm. Hg absolute at the top of the column (reboiler pressure equalled approximately 140 mm. Hg abs.). The nitric acid concentration ranged from 60 per cent in the reboiler to 0.01 M at the top of the column. The reboiler temperature was 175 to 185°F., with steam condensing at 230°F. In the following table, corrosion rates under these conditions are compared with those obtained for atmospheric pressure fractionation, which were reported last month.

CORROSION RATES OBTAINED
DURING NITRIC ACID FRACTIONATION

Reboiler Contents = 60% Nitric Acid

Item	Stainless Steel Type	Corrosion Rate, In./Mo. Top Column Pressure (Absolute) 760 mm. Hg(a)	110 mm. Hg.(b)
Boiler Tube	304-L	0.006	0.001
Boiler Tube	347	0.013	0.007

Notes: (a) Steam temperature = 310°F.
(b) Steam temperature = 230°F.

The nitric acid corrosion rate for the Type 347 stainless steel heat transfer surface at atmospheric pressure agrees well with the 0.013 to 0.018 in./mo. previously reported (HW-31030), but the 0.007 in./mo. rate obtained under vacuum operation is higher than the 0.001 in./mo. reported in HW-31350. The corrosion rates for the Type 304-L stainless steel heat transfer surface are equal or superior to those for Type 347 and 309 cb (HW-32339), and it is concluded from these data that vacuum fractionation of nitric acid effectively minimizes corrosion of the nitric acid fractionator reboiler tubes.

Protective Coatings - Amercoat 74, 3-Coat vs. 5-Coat Systems - Static immersion tests in 20 and 60 per cent nitric acid at room temperature of the 3 and 5-coat systems of Amercoat 74 on concrete blocks have indicated that the 5-coat system is definitely superior to the 3-coat system from the standpoint of the protection it gives to the concrete surface. Under identical exposure conditions, when the 3-coat system begins to show attack on the concrete, the 5-coat system, while showing a poor seal coat, will have relatively unaffected prime and body coats with the concrete not yet reached. Both systems resisted attack by 20 per cent nitric acid for 35 days. After increasing the acid strength to 60 per cent, the acid penetrated to the concrete under the 3-coat system in less than 8 hours. At the end of the same period while a complete separation had occurred between the seal and body coats of the 5-coat system, the body coat was still tough and the concrete was dry.

Phenoline 300, 2-Coat vs. 3-Coat Systems - Static immersion tests in 20 and 60 per cent nitric acid of the 2 and 3-coat Phenoline 300 systems indicated that the 3-coat system is superior to the 2-coat system simply by virtue of the additional thickness. The thicker the coat, the longer it takes for the prime coat to be affected. As soon as the nitric acid reaches the prime coat, complete loss of adhesion results.

REDOX DEVELOPMENT

Process Chemistry

Hydrogen Evolution from Mercury-Catalyzed Dissolvings - Seven additional runs were made using unirradiated Hanford 4 inch jacketed slugs in a continuation of the study of hydrogen evolution during mercury-catalyzed aluminum jacket dissolving with nitric acid. Definite progress is being made in finding conditions under which hydrogen evolution can be suppressed. The results show that coating

removal was essentially complete before a significant amount of uranium was dissolved, thus indicating that an acid coating removal step might be utilized with the resulting solution either discarded or blended with the subsequent metal cuts. Since no uranium is dissolved in this coating removal step, it is not believed that any significant reduction in the present time cycle could be achieved, but neither does it appear that the cycle would be increased. Work is continuing in an effort to define a practical flowsheet for plant use.

Head-End MnO_2 Cake Studies - Laboratory studies have been made with manganese dioxide (both co-formed and pre-formed) as a possible replacement for the current permanganate head-end treatment. The results indicate that ruthenium is not only poorly scavenged but is also oxidized to the volatile tetroxide by the MnO_2. In addition, the Ru decontamination achieved by this head-end technique is not as great as may be necessary for Redox operation.

Ruthenium Removal by Ozonolysis - Despite the fact that the initial ruthenium concentration in the solutions used was low enough to cast doubt on the validity of the final results, the following tentative conclusions were reached regarding the use of ozone:

1. The 60 per cent UNH solution produced by the concentration of RCU solution from the Uranium Recovery Plant can be decontaminated (from Ru) at approximately the same rate and under the same conditions as previously reported for Redox product uranium solution.

2. The addition of persulfate ion to a Redox E-12 (decontaminated 2M UNH) solution will reduce the induction period for Ru volatilization and increase the rate of Ru removal by ozonolysis. (Ammonium persulfate adds no metals to the final UO_3 product, and the sulphate will enhance the reactivity of the UO_3.)

URANIUM RECOVERY DEVELOPMENT

Process Chemistry

U.R. Process Performance - Intermittent foaming occurring in the 224-U Building calcination pots has, in general, been found to coincide with higher-than-normal DBP analyses of C-1 (60 per cent UNH) solution. The analysis, currently employed, however, is not specific for DBP. During recent plant operation when the 224-U calcination pots were foaming, a diluent wash of C-1 solution was found to remove the foaming agent, as determined by laboratory calcinations. This is taken as strong evidence that a foaming agent other than DBP is present in the Plant C-1 solution, since the U-DBP complex is not removed by a diluent wash. Infra-red studies to characterize the unknown foaming agent are in progress. Various washing procedures have been tried on Plant RCW in the laboratory in an attempt to reduce the relatively high E_a° values ("C" contacts) reported for plant solvent. Sodium hydroxide, carbonate, stannite, and sulphate as well as hydrogen peroxide, and phosphoric acid contacts were found to be without appreciable effect. A scavenge with Darco was no better. This solvent characteristic may or may not be related to the foaming problem in 224-U Building.

Reactivity runs were made in the laboratory to establish a value for the new hydrated, highly reactive UO_3 standard recently received from Oak Ridge. For a hydrofluorination time of 30 minutes at 410°C., the reactivity ratio of the new standard to the old (Mallinckrodt T-268) was 1.43. At 260 C. the ratio was 2.15, but temperature control was not believed to be accurate at the lower furnace setting, and the validity of the latter figure is in doubt.

MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

Process Studies

TBX Program - A number of processing methods are currently being evaluated for the processing of an increased tonnage of low-NGS irradiated fuel at Hanford. Although reactivation of B Plant would require a smaller capital investment and probably less engineering and construction effort than other processing methods, which might be considered, operating costs for processing uranium through a combined $BiPO_4$-TBP process are considerably larger than for processing the same uranium by other methods such as Purex. Annual operating costs are being compared for the following methods of processing 3600 tons of 200 MWD/T uranium a year:

Method 1 - Both B and T Plants operating. Uranium wastes from the Bismuth Phosphate Plants would be stored temporarily, then processed in the TBP Plant.

Method 2 - B and T Plant dissolvers would be operated to produce feed solution which would be pumped to 221-U for further processing. The TBP Plant would be modified to permit operation at essentially Purex processing conditions. The co-decontamination cycle and partition cycle would be included in the 221-U Building. Final uranium and plutonium decontamination cycles would be built in a new facility designed for contact maintenance. Equipment would be provided for HNO_3 recovery. This conversion of the TBP Plant to operate at Purex process conditions is tentatively being called the TBX Plant.

Method 3 - Employs the TBX process as in Method 2, but no nitric acid recovery equipment would be provided.

Method 4 - Both $BiPO_4$ Plants would be converted to permit Bipex processing (i.e., the Pu second product cycle equipment would be replaced by a new solvent-extraction facility). Uranium from the Bipex Plant would be temporarily stored, then later processed through the TBP Plant.

Comparison of the operating costs for the above methods indicates that Purex-type operation results in annual operating costs $10,600,000 to $12,800,000 less than $BiPO_4$-TBP operation. For a two-year period of processing low NGS material, the indicated operating cost savings would be from $20,000,000 to $25,000,000.

Since the economic incentive for operating at Purex conditions is great, effort is currently being devoted to determining: (1) the order of magnitude of the capital investment required, (2) the engineering and construction effort required, and (3) the impact on the over-all operations program of a number of schemes

Chemical Engineering Development

Uranium Isotope Separations by Solvent Extraction - Two solvent-extraction runs were made in a high-efficiency 3 inch diameter pulse column with a view to investigating the presence and extent of differences in behavior between uranium isotopes (U-235 and U-238). The results of feed and raffinate isotopic analyses (by mass spectrograph) indicate that under the conditions of both runs U-235 was probably slightly more solvent favoring than U-238, but the magnitude of the difference was only of the order of magnitude of experimental error. In both runs, the most probable value of the ratio of distribution coefficients (α) was approximately 1.00003.

HOT SEMIWORKS

Conversion to Purex

The conversion of the Hot Semiworks facilities to the Purex process is progressing with the construction status on July 25 reported as 82 per cent complete. Beneficial occupancy of A cell is expected the first week in August with B and C cells about August 15, 1954. Calibration and flushing will commence as soon as the cells are received from construction.

Construction has started on the waste self-concentrator which is now 5 per cent complete.

Redox Studies

One thousand gallons of E-12 solution (concentrated 3EU) from the Redox Plant have been received, and a series of runs involving tail-end ozone sparging for ruthenium removal is underway on a nominal 50 gallon scale. These studies are to be conducted at different air-to-liquid ratios, sparge rates, and ozone concentrations. The ozone is being supplied by one of the 16 Welsbach ozone generating units originally furnished for the Redox Plant. Preliminary results of a shakedown run indicate ruthenium was successfully removed from the uranium solution with an indicated 5-fold decontamination factor (arithmetical value) after sparging for one to two hours.

REDOX PROCESS TECHNOLOGY

Summary

The extended Redox Plant shutdown (commenced on June 9) for the Stage I installation of Phase II equipment was concluded on July 18 with the H-4 Oxidizer readied for service. Initial operation of the plant has been satisfactory with no indications of difficulties due to the new equipment design. Utilization of the aluminum nitrate in the 3D Column waste as the salting agent in the 2D Column has been made since start-up. Uranium and plutonium recovery and plutonium decontamination have been excellent. However, uranium decontamination has been poor as a result of the recurrent entrainment problem in the Uranium Cycles.

Process Performance

The first material processed through the plant was approximately 4.4 tons of uranium having a pile exposure of 897 MWD/T and "cooled" for approximately 200 days since discharge. This material was charged into C-2 dissolver (which contained no uranium heel and had recently been flushed with hydrofluoric-nitric acid mix), dissolved, and processed through the plant as a segregated batch. Since the processing vessels had been flushed, the isotopic content of the recovered plutonium (PR batches L-1 through L-6) was representative of that for 900 MWD/T material. The first product batch was reworked for additional decontamination, and the remaining five batches are being processed through 231 and 234-5 Buildings for special study. In addition, special samples (dissolver and AT solution) were taken for additional study and determination of the isotopic distribution.

The next two Head-End batches contained approximately twice the normal quantity of plutonium because of the large quantities of 231 and 234-5 Building recycle material added. These batches were processed with Plutonium Cycle flow ratio adjustments made to stay within the critical mass control limitations. During the processing of these batches, 190 units of plutonium were lost in the Plutonium Cycle wastes to be recovered subsequently from three salt waste batches. No stream samples are available for proving the source of these losses, but it is believed that they originated in the 2AW because of a temporarily high (ca. 20 per cent) aqueous/organic ratio in the 2A Column extraction section and erratic interface control.

Following one normal Head-End batch, eight IAF batches (HE-5 through HE-12) were processed containing salt waste blended with dissolver solution in approximately a ratio of 1:2. Recovery of both uranium and plutonium was excellent, approximately 99.7 per cent.

Processing rates between 4 and 7.5 tons of uranium per day have been used. Plutonium decontamination (except for PR Batch L-1) was adequate (dF of 7.0) since plant start-up. However, initial uranium decontamination performance was slightly inferior (dF of 6.3), presumably caused by several upsets of the 2D and 3D columns as a result of difficulties with instruments. In general, however, the extraction battery operation went well considering the numerous changes in instrumentation and equipment involved. Continued operation of the Uranium Cycles has indicated no improvement in decontamination, and it is suspected that the recurrent entrainment problem is plaguing the operation at month end.

Continued use of the temporary silica gel tail-end facility has been required to decontaminate the uranium product which is out of specifications because of the entrainment in the Uranium Cycles. Since start-up on July 22, 21 tons of uranium have been decontaminated from an average gamma ratio of 7.2 to 1.5 (ca.35 per cent ruthenium, 65 per cent zirconium-niobium). This makes a total throughput since regeneration of 47 tons (ca.250 bed volumes) compared with a throughput of 32 tons before the regeneration. Since the cause of the poor decontamination is associated with solids, an appreciable fraction of the zirconium-niobium removal and all of the ruthenium removal has probably been by filtration rather than absorption. However, a break-through is expected soon.

In spite of the uranium decontamination difficulties being experienced at month end, overall performance of the new Phase II columns (1S, 1A, 1C, 2D, 3D, and 1O) appears to be satisfactory. In addition, few difficulties have been experienced with the new evaporators (F-2 1CU-3DW Concentrator, G-3 Organic Still, and H-4 Oxidizer No. 4) except that the capacity of the current H-4 is limiting the 1AF batch size at approximately 3.9 tons uranium (vice 4.3 tons for H-4 Oxidizer No. 3) and will ultimately limit the plant capacity until a larger H-4 Oxidizer is installed. Steam traps on F-2 and G-3 have caused trouble, but after adjustment, they should be satisfactory.

Feed Preparation

The dissolvers were charged with one charge of uranium having a pile exposure of 897 MWD/T (200 days "cooling" time) and remaining charges of approximately 600 MWD/T (100 days "cooling" time). 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.

All 1AF batches were oxidized with the permanganate Head-End treatment procedure (HW-32164-Review of Redox Plant Head-End Treatment, G. R. Kiel, June 17, 1954) using chromic nitrate as the reductant. The "catalytic kill" technique was used to reduce the residual permanganate following oxidation, and partial scavenging with approximately 0.008 M MnO_2 was employed. Variations in the amount of potassium permanganate added to different 1AF batches were required because of the changing concentrations of reducing agents present as a result of 231 and 234-5 Building recycle and waste rework.

Uranium Extraction and Decontamination

Use of the Phase II equipment has permitted one-stage backcycle of aluminum nitrate; i.e., return of 3DW solution from the 3D Column (after concentration) to the 2D Column as 2DS (blended with 2DF). Otherwise, the Uranium Cycle flowsheets have not been changed appreciably.

Waste Processing

The temperature profile in the three foot diameter test tank in 101-SX Waste Storage Tank changed only slightly during the month. With the tank inlet closed from July 2 until July 22, the temperature fell from 235 to 224 F. at the bottom of the tank and rose from 131 to 158 F. in the supernate above the twelve foot level. The maximum temperature was at the four foot level and varied between 261 and 268 F.

On July 21 it was found that some activity was being emitted from the air cooled condenser on the 101-SX Tank. This condenser (having horizontal fins) was therefore capped (as are all the other air cooled condensers on the 241-SX Tank Farm), and the 101-SX tank vent was opened through 106-SX tank to the water cooled condensers in the new condenser building (see HW-31884 - Project CA 539: 241-SX Tank Farm Description and Use of Facilities, E. T. Merrill, May 18, 1954).

A temperature traverse of the bottom of the 101-SX tank on July 21 showed a maximum of 205 F. directly beneath the inlet and a minimum of 177 F. at the point farthest removed from the inlet. The supernate in 101-SX had a temperature of 147 F. on July 28 and a liquid level of 13 feet, 9.5 inches.

Pressure surges in 101-S Tank similar to those reported last month have continued on a frequency of approximately one per day. On one occasion, instead of previously observed series of bumps, there was only one protracted eruption lasting 3.75 hours. It took 6.5 minutes to reach the maximum pressure of 35 inches of water, remained at this maximum pressure for 9 minutes, and then declined gradually pausing at a fairly constant presssure of 11 inches of water for approximately two hours before dropping to zero.

BISMUTH PHOSPHATE PROCESS TECHNOLOGY

When the pre-heaters on the iodine reactor failed, the dissolving procedure was modified to start the procedure on 50 per cent nitric acid, vice 60 per cent. The specific gravity control point was modified to account for the difference in the dissolving procedure. The iodine emission was reduced to a negligible amount. The change resulted in one to one and one half hour increase in the total time cycle.

Fourteen runs were processed on Projection Test 221-T-17 (HW-31898, "Increased UNH Concentration in Bismuth Phosphate Extraction Step") initiated by the Process Engineering Unit. Six of these runs at 24 per cent UNH concentration gave waste losses ranging from 1.76 to 5.20 per cent (uncorrected for Am-Cm) and were reworked. The test was temporarily discontinued because of the uncertainties associated with (1) the UNH concentration resulting from the new dissolving procedure and (2) the effects of using 5-9 heel (scavenged waste from 5-6) as make-up water. When these factors are under control, the test will be reactivated.

URANIUM RECOVERY PROCESS TECHNOLOGY

Tank Farm Activities

Approximately 6520 net gallons of stored waste were removed by water sluicing and direct transfer of supernatant for each ton of uranium removed at the tank farms. The sluice water volume added about 5970 gallons per ton of uranium. The above feed uranium included about 5.4 per cent aged a minimum of 2.9 years from pile discharge, and had an overall arithmetic minimum age of 3.2 years from pile discharge after irradiation to an average 365 MWD/T. High removal rates experienced during utilization of continuous water sluicing-blending operations, were continued. In addition final cleanout operation, leading to the ultimate release of tanks 101, 102, 103-BX, and 102-TX for other use, were completed in less than one month whereas earlier clean-out operations, following the removal of the major portion of the uranium by standard sluicing techniques, required two to three months. Despite the short clean-out time required some production curtailment was experienced at both BX and TX farms during cleanout periods. An overall average operating time efficiency of 88 per cent was attained at CR (use for BX supernatant blending), BXR, and TXT facilities while UR remained inactive due to depletion of available aged feed with the final cleanout at 106-U.

Feed Preparation

Routine blending operations at the tank farms, and adjustment of acid concentration to give an average 3.44 M titratable nitric acid in the concentrated feed required about 16,120 pounds of 100 per cent nitric acid per ton of uranium. The feeds supplied from the tank farms were supernatant rich having phosphate and sodium to uranium mol ratios of 2.0 and 24.4, respectively, compared with similar respective values of ca.1 and 15.1 for "flowsheet" feed. An average 67 volume per cent boiloff was realized in routine concentration operations and the concentrated feed was supplied uncentrifuged to the solvent extraction batteries. Non-routine feed processing included handling RCU rework (about 7.5 per cent of the new feed uranium) both with and without concentration but with acid butting to about 2 M nitric acid in either case, and processing an additional 1.7 per cent of the feed uranium returned via C-2 tank from the 224-U Conversion Plant.

Waste Handling

Routine neutralization and concentrations operations produced about 6200 gallons of salt waste, at an average pH of 9.0, and containing about 1.7 per cent of new feed uranium for each ton of new uranium processed. About 23,800 gallons of low activity waste containing an additional 0.3 per cent of new feed uranium were routinely cribbed. Authorization for construction of initially required facilities, received July 7, 1954, should permit initiation of transfer of nickel ferrocyanide-scavenged TBP Plant current waste to cribs about October 1, 1954.

Solvent Extraction

The solvent extraction batteries operated at about 58 per cent on-stream time efficiency with average processing and production rates of 69 and 63 per cent of nominal design input rate, respectively. Of the gross uranium processed 91.5 per cent was shipped to 224-U, 6.9 per cent (7.5 per cent on a new feed basis) was routed to RCU rework, and the balance of 1.6 per cent (1.7 per cent on a new feed basis) was routed to process wastes. No significant deviations were made from nominal flowsheet conditions employed at the close of the previous report period.

The RA Column losses ranged from 0.3 to 3.0 per cent, and from 0.01 to 6 per cent, averaging about 0.8 and 1.2 per cent of feed uranium on "A" and "B" Lines, respectively. In general, the losses were commensurate with the feed composition, i.e., with the $K^{1/2}(NO_3)$ values and required L/V. Again, it was observed that the addition of rework, thereby utilizing UNH as a process chemical to effectively increase the organic flow and the $K^{1/2}(NO_3)$ value, resulting in a decrease in the overall waste losses. Although the effect of solvent contaminants remained a questionable area during the report period, it is believed that some effect is yet present resulting in a higher RAW losses than under ideal solvent quality conditions. RAW loss maxima incurred during this period were experienced under adverse extraction conditions of high L/V values and probably were aggravated by poorer than normal phase dispersion as well as by the possibly lower uranium transfer rates at high aqueous phase phosphate ion concentration.

The RC Column losses averaged 0.2 and 0.1 per cent of new feed uranium from "A" and "B" lines, respectively. Both RC Columns operated with widely varying losses from as low as 0.005 to as high as 0.5 per cent. Poor solvent quality appeared to be a major factor contributing to erratic losses through "unstrippable" uranium remaining in RCW, and, particularly in "A" Line, probably by emulsion induced instability.

Gross gamma decontamination of tank farm feeds, except for a period at the start of July when an abrupt increase in feed activity resulted from the introduction of about 50 weight per cent of feed uranium from 104-BX supernatant, and during startups, resulted in an average RCU fission product activity level of 215 per cent of aged natural uranium gamma. Gross gamma dF's ranged from 4.2 to 4.6 in both lines and correlated, as previously observed, with feed composition. At month's end approximately 15 weight per cent of the feed uranium was from 104-BX, in highly supernatant rich feed, resulting in a calculated minimum 3.4 year "age". No difficulty was experienced initially in processing this feed, with gross gamma dF's of about 4.6 including ruthenium gamma dF's of 3.55 to 3.65, to give RCU at an average 185 per cent of aged natural uranium. Little or no change in RCU gamma activity was experienced in the laboratory when samples were heated indicating that solvent-associated activity breakthrough was at a negligible level.

Plutonium, nitric acid, and total metallic impurities in RCU averaged 2.9 parts per billion parts of uranium, 0.11 pounds per pound of uranium (equivalent to 0.05 M at flowsheet RCX), and 130 parts per million parts of uranium. The nitric acid average value, considering the RA Column water scrub section operating L/V of 0.16, is about 1.5 fold higher than expected.

Solvent Treatment

The use of RO Columns at L/V ca. 0.1 and ROO Receivers at L/V ca. 0.15 using a three weight per cent sodium carbonate wash was continued with sporadic periods of satisfactory cleanup and generally borderline or poor results. Characterization of the problem is continuing to be a major target of laboratory efforts with supplementary evaluation of various cleanup techniques being performed for immediate plant use. As of report date, little success had been realized, in the laboratory, through the use of more or less "standard" agents including various combinations of sodium carbonate, hydroxide, phosphate, and sulphate, or through the use of mineral acid washes, sodium sulphite, and hydrogen peroxide. Some success appeared to be realized in one case where a two per cent sodium oxalate wash at 50 C reduced an E°/a from 0.043 to 0.003 and the potential application of oxalate ion is being pursued. Activated carbon does not appear to remove the troublesome component. Solvent consumption for the period included 8 gallons of TBP and 21 gallons of diluent per ton of uranium processed compared with 11.4 and 55 gallons of TBP and diluent, respectively, per ton of uranium processed in June. The value of 22 gallons of TBP per ton of uranium reported in June included inventory discrepancies.

URANIUM CONVERSION PROCESS TECHNOLOGY

An average production rate of about 30 per cent of design capacity, including gas-fired pots, was sustained during the period. Essentially all uranium calcined was from TBP recovery operations. Over 98 per cent of the uranium

was calcined in electric pots. The major factor contributing to low production rates was lack of sufficient feed from the extraction plants. The UO_3 shipped averaged 113 per cent of aged natural uranium gamma (by H.A.P.O. method), 197 parts of metallic impurities per million parts of uranium, and less than 5 parts of plutonium per billion parts of uranium. Process difficulties due to foaming continued despite efforts to minimize hold up time before the stripper and to operate the stripper at high steam to feed ratios. Several short periods of pot operation were realized using T-C-1 (pot skin temperature) settings of 625 C, corresponding fairly well with transient periods of "B" Line operation with ROO $E^{a}/_{a}$ values of less than ca. 0.012, but through nearly the entire period T-C-1 settings were limited to about 400 C. Pot room gamma radiation rose to a weekly high of 63 mrad./hr., through the shielding, at the time when the TBP Plant was processing about 50 per cent of feed uranium from 104-BX, and averaged ca. 47 mrad./hr. for the report period.

Reactivity improvement testing continued to demonstrate the desirability of slower agitator speed (higher torque) to overcome the difficulties due to caking when 0.08 weight per cent (sulphate to uranium basis) sulfamic acid is employed as additive to the pot feed. Fifteen calcinations at 0.08 weight per cent sulfamic acid were carried out successively, without caking, in Pot No. 9 equipped with 30 rev./min. (vice 37.5 rev./min. standard) agitator drive gears. Ten successive calcinations were carried out in Pot No. 13 (known poor record for caking at 0.08 weight per cent sulfamic acid) using 0.06 weight per cent sulfamic acid, and a standard 37.5 rev./min. agitator drive speed. An eleventh calcination at nominal 0.06 weight per cent sulfamic acid resulted in caking when the uranium concentration in the pot feed was reduced so that the effective sulfamic acid concentration reached a calculated 0.078 weight per cent. On the basis of the tests at 0.06 weight per cent sulfamic acid, and an average reactivity of over 1.2 realized, it is planned to process several test carloads under these conditions.

Equipment highlights included the replacement of the original corroded schedule 10 fume vent header piping with new schedule 40 pipe, the installation of a new orlon bag in the X-3 (unloading) location, and the failure of Pot No. 8 through burnout of electrical elements (1200 mrad./hr. around elements). Although each of the above items involved down-time no inventory buildup of significant amounts of uranium resulted. Acid recovery operations resulted in returning 846 pounds of nitric acid to the tank farms for each ton of uranium processed. The above acid, in ca. 35 per cent solution contained 0.9 per cent of the uranium calcined. A design for continuous chloride purge equipment has been completed for the T-A-1 (absorber) tower for use in the planned test operation for production of high (over 53 per cent) concentration nitric acid by absorber operation alone.

Z PLANT PROCESS TECHNOLOGY (ISOLATION, PURIFICATION, AND FABRICATION)

Isolation Building (Task I)

Use of Kel-F filter media for the filter stick has resulted in ready plugging. Silicon, chromium, and iron with smaller amounts of aluminum and manganese have been found as part of the composition of the plugging material. These solids probably originated in Redox PR solutions and, unless they can be eliminated from these solutions, make unattractive the adoption of Kel-F filter media of this low porosity (nominal 15 micron por size).

A general plutonium contamination of Cell 4 occurred when nitric acid decomposition fumes vented through the P-1 tank chemical addition funnel during a 60 per cent nitric acid dissolution of a plutonium peroxide cake. Prior to the incident, the same cake had been put through the decomposition cycle but had not dissolved. It was concluded that a 30 per cent hydrogen peroxide solution instead of a 60 per cent nitric acid solution had been added when an analysis of the solution in the PR-4 tank revealed a 1 M nitric acid concentration and a three per cent hydrogen peroxide concentration. The presence of excess hydrogen peroxide in the cake probably caused a reaction more vigorous than normal upon addition of 60 per cent nitric acid, increasing the pressure in the P-1 tank to an amount greater than has been experienced during similar cake dissolutions. A recommendation was made during the incident investigation to increase the pressure differential between the Cell 4 room and process vessels within the greenhouse.

Dry Chemistry (Task II)

Based upon the color of the fluoride powder, 3.6 per cent of the runs entering Task II required rehydrofluorination. This compares to 6.2 and 15 per cent rehydrofluorinations for May and June, respectively. The percentage of totally pink fluorides dropped from 33 per cent in June to 25 per cent in July. The majority of the powders in July were a mixture of blue and pink fluorides.

Reduction (Task III)

The plutonium yield from the reduction of plutonium fluoride powders in Task III averaged 98.2 per cent. The average yields for May and June were 98.9 and 97.5 per cent, respectively.

Four off-standard runs were observed. A "boil-over" occurred during the reduction of one run and maximum pressure rises of 260, 220, and 168 psig occurred during the reduction of three other runs. The plutonium yields were 97.1., 84.3, 95.4, and 98.0 per cent, respectively. The occurrence of high pressures during reductions generally follow a period when the furnaces have been idle. Calcium and iodine are frequently "held-up" in the Task III mixing and transferring equipment and upon standing probably form $Ca(OH)_2$ and $CaI_2 \cdot 6H_2O$. In addition, other iodides which may form within the furnaces such as ferrous iodide are also very hygroscopic and form hydrates such as $FeI_2 \cdot 4H_2O$. Hence, when the furnaces are used for reductions after being idle for several days it is not unlikely that high pressures would result due to calcination of the hydrates.

Machining (Task V)

A metal fire occurred during the removal of three ice cream cartons containing plutonium turnings from Hood 200-A, preparatory to their transfer to the RG-line for briquetting. The cause of the fire is unknown. However, the pyrophoric nature of plutonium turnings is well known and it is possible that the fire could have started from a spark from the turnings during the removal operation. The castings from which the turnings originated included the buttons which yielded high pressures on reduction, as described above. On the other hand, it would seem probable that pyrophoric materials associated with the buttons would remain with the skull during the casting step. Furthermore, the subject castings machined nicely, i.e., no evidence of pyrophoricity. A second, less likely, possibility of the source of trouble is arcing during the sealing of the plastic bag. The incident resulted in major contamination of the Zone III area back of the Task V area.

Although the incident was potentially a very serious one from the stand-point of personnel contamination as complete production curtailment, by the alert action of the operators, the area of contamination was confined to the Task IV and beyond area. Tasks II and III with relatively minor clean-up operation were in operation at month end.

Repetition of this exact incident is improbable since a briquetting hood was in process of installation in the RMA Line at the time of the subject incident.

IN-LINE INSTRUMENTATION

Explosion-proof conduit was installed in the Redox Organic Sample Gallery for gamma-monitor wiring, and an explosion-proof solenoid-operated valve was installed in the 2DU actuating gas line to provide remote control of the 2DU sampler for flushing and draining the 1BU-2DU gamma monitor sample cell. Laboratory shakedown tests on the 1BU-2DU gamma monitor equipment, using aqueous Zr^{95} tracer solution at the level of 1890 equivalent gamma microcuries per gallon, disclosed that equilibrium sorption of Zr-Nb activity on glass sample cells up to 15 per cent of the stream activity may be expected. The instrument is capable of indicating and recording sample activities ranging from 100 microcuries per gallon to 0.3 curie per gallon.

A sample solution strainer was installed on the suction side of the "A" Line RAF uranium photometer sampler to protect the unit from plugging by extraneous insolubles in the sample stream. Accurate evaluation of the effectiveness of this device has not been possible to date as a consequence of non-standard routing of process solutions, which has resulted in intermittent reduction of tank liquid levels below the sampleable limit.

Plant use of polarograph-type in-line instruments has been suspended as a result of exorbitant maintenance requirements. A program for redesign and non-plant testing of prototype polarograph sensing units has been established.

The target date for completion of the installation of in-line analytical equipment at the Hot Semiworks has been revised to September 1, 1954 in conformance with a reestimate based on vendor's promised delivery dates for equipment now on order.

Installation of a plant-type sampler facility, located outside the 321 Building, was completed during the month. This facility will be used for the testing and development of prototype in-line instruments, sample degassers and strainers, sample pumps, control valves, and monitor cycle controllers.

234-5 DEVELOPMENT

Task I and III Prototypes - Construction Progress

Assembly and installation of the Task I and continuous Task II prototypes are progressing slowly. It is hoped that the Task I installation, except for the continuous filter, will be ready for use by September 1 and the Task II installation by October 1.

Recuplex Development

The data which were obtained in a laboratory investigation of the relationships between Recuplex feed composition and the extraction coefficients for plutonium(IV) have been correlated in the form of an empirical equation. The equation expresses the extraction coefficient as a function of the feed composition and of the plutonium concentration in the organic phase. It may be used to calculate the equilibrium curve for any feed stream composition which is likely to be of importance to the Recuplex process, and has been used in the evaluation of various flow sheets. The experimental work also yielded data from which the relationship between the extraction coefficients for Pu(IV) and Pu(VI) could be calculated.

Study of the maximum plutonium concentrations which might occur in Recuplex process streams has started, with a batch, counter current run made under total reflux. Using a flow sheet believed to be suitable for the processing of F-10-P (15 per cent TBP in CCl_4), the maximum concentrations were as follows: in the extraction column, 20.9 g/l in the aqueous phase and 50.4 g/l in the organic; in the scrub stage, 74.2 g/l in the aqueous phase and 20.4 g/l in the organic.

A one inch diameter, rotating disc extractor, modified from a Shell Development design, has been tested with uranium on the Purex IA column flowsheet. The HETS and HTU values were 3.75 and 1.76 inches, respectively, when the column was operated at 95 gallons/hour/square foot and a disc rotation speed of 210 RPM.

RECUPLEX CONSTRUCTION

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 52 per cent completed. Installation of all the vessels for the Slag-and-Crucible Hood has been completed. Assembly of the solvent extraction columns and installation of the interhood ductwork has commenced. A construction schedule, prepared by members of Project Section, indicated a revised "ready for use" date of January 1, 1955.

A study concerning the adaptability of the Recuplex facility to the "4X" Program indicates that at the production rates presently anticipated for FY 1956, the present Recuplex equipment (with minor modifications for criticality control) may be employed in either of two processing schemes: (1) continuous processing of low MWD/T material for off-site shipment as the nitrate solution and either storage or recycling of the high MWD/T waste streams from the 234-5 Building, to the Redox, and/or Purex Plants; and (2) alternate processing of low MWD/T product solutions and high MWD/T recovery solutions, thus necessitating the construction of adequate storage facilities for the F-10-P solutions from B and T Plants. Either scheme permits, with the concurrent activation of Task I, the shutdown of the 231 Building.

ANALYTICAL LABORATORIES

General Chemical Laboratory - The new horizontal beam X-ray Photometer referred to in last months report has been extensively checked with standard solutions and aluminum blocks. The calibration curves and corrections for various ions have been prepared so that a large variety of uranium or thorium samples may now be analyzed. This instrument is generally useful for samples containing over 2 g/l uranium or thorium. A study of extraction of low level uranium, LO.1 g/l, into various organic phases has been initiated in connection with the attempted improvement of the fluorometric method of analyses. Operation of apparatus for the determination of hydrogen in heavy metals, specifically zirconium, was accepted from the Applied Research Sub-Section, Chemistry Unit.

Radiochemical Laboratory - A letter report covering the use of the thiocyanate-citrate-oxalate complexing mixture for sodium hydroxide titration of low level nitric acid in uranium solutions was issued. Results were very favorable for acid uranium systems but of no value for plutonium solutions. It should be noted that this is the complexing mixture used in coulometric acid evaluation. the pyrohydrolysis method was utilized for the analyses of uranium ammonium fluoride salts. The procedure was modified to the extent that the separated fluoride in the condensate was determined by weighing as PbClF. Investigation of the Gamma Spectrometer as a means of determining criticality in the N-1 tank, 231 Building, is continuing. Alpha counting as a means of getting uranium isotope data has been considered; at present the value for such a purpose is marginal. Studies are in progress to determine the possible loss of Ru during dissolution of cellulose (from chromatographic samples) and to adsorption on the glass vessel walls. Samples from the dissolution of an irradiated thorium slug were evaluated for Pa-233, U-233 and Th-232 (in the absence of fission products). Pa-233 is readily measured on the Gamma Spectrometer. For U-233 assay the ORNL method employing hexone extraction followed by direct mounting and alpha counting, was used. Th-232 was determined by X-ray absorption.

Spectrochemical Laboratory - A method is being developed for the determination of beryllium by an arc method, in anticipation of the evaluation of air samples collected upon filter paper. At present the method covers the range of 0.5 x 10^{-9} to 10 x 10^{-9} grams Be, with a precision of ± 2 per cent and an accuracy of ± 10 per cent. The method is being expanded to cover a range up to 10 x 10^{-8} grams.

Mass Spectrometry and Water Quality Laboratory - Work in support of the Mint Program continued with very little instrument down time. Two Hoke valves on the in-line sampling system developed leaks and were repaired without interruption of normal sampling schedule. Increased interest in pile gas composition under operating conditions promises a rigid sampling schedule and a steady flow of samples from this source. Preliminary investigation of the colorimetric iron procedure employing the reagent 4, 7 - Diphenyl - 1, 10 - Phenanthroline has produced excellent results, indicating as little as 0.0005 ppm Fe may be determined in a 250 ml water sample.

	June		July	
	Number of Samples	Number of Det'ns	Number of Samples	Number of Det'ns
Research and Development				
Applied Research	1061	2209	610	1636
Pile Technology	266	1351	143	573
Fuel Technology	38	573	15	439
Separations Technology	354	666	217	634
Process Assistance	265	534	194	1109
Others	128	1049	54	274
Total	2112	6382	1233	4665

Standards and Calibrations	June	July
Number of standard solutions prepared	19	34
Stock solutions dispensed	60	67
Number of calibrations performed	1	3
Number of calibrated glassware dispensed	11	0
Number of checked glassware dispensed	0	5
Total	91	109

V. R. Cooper - Manager
Separations Technology Sub-Section
August 10, 1954

VRC:md

APPLIED RESEARCH SUB-SECTION

MONTHLY REPORT

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Applied Research Sub-Section

VISITORS AND BUSINESS TRIPS

L. O. Sullivan, General Engineering Laboratory, and D. S. Billington, Oak Ridge National Laboratory, visited Hanford on July 14 and 16, respectively, to discuss hot laboratory facilities.

E. R. Asterley, Knolls Atomic Power Laboratory, visited Hanford July 26-27 to discuss fuel element testing.

H. H. Hopkins, Jr., attended the Gordon Research Conference, New London, N. H., on July 1-2.

F. W. Albaugh attended conferences July 4-9 on Association Island, Pierrepont Manor, N. Y., and July 8-9 he also visited Knolls Atomic Power Laboratory to discuss personnel transfers and Assistance to Hanford programs.

S. M. Hauser, E. Z. Block, W. B. Farrand, E. J. Seppi, and J. O. Erkman attended the American Physical Society Meeting in Seattle, Washington, July 6-10.

D. C. Kaulitz visited Phillips Petroleum Co. (MTR), Idaho Falls, Idaho, on July 1-11 to install high pressure loop and to observe start-up of experimental pile apparatus.

G. M. Muller spent July 14-16 at Oak Ridge National Laboratory discussing nuclear safety at Hanford; July 19-20 at Brookhaven National Laboratory, Upton, N. Y., discussing exponential experiments and theory; July 21 at NDA, White Plains, N. Y., discussing reactor theory; and July 22-23 at Knolls Atomic Power Laboratory discussing temperature coefficients and reactor physics.

T. W. Evans visited Phillips Petroleum Co. (MTR), Idaho Falls, Idaho, on July 27-31 to observe start-up of experimental pile apparatus.

D. C. Kaulitz and R. E. Hueschen visited the Gaertner Scientific Corp., Chicago, Illinois, on July 29-31 to obtain engineering data and investigate the possibility of this company building a new type elevated temperature testing unit for irradiated materials.

M. D. Freshley visited Phillips Petroleum Co. (MTR), Idaho Falls, Idaho, July 31, to observe experimental pile apparatus.

ORGANIZATION AND PERSONNEL

Personnel totals as of July 31 were as follows:

	Exempt	Technical Graduates		Non-Exempt	Total
		Permanent	Rotational		
Physics Unit	28	1	1	7	37
Metallurgy Unit	43	0	4	25	72
Chemistry Unit	49	0	3	14	66
Administration	1	0	0	4	5
Total	121	1	8	50	180

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METALLURGY

Irradiation Effects on Uranium

Twelve Zircaloy-2 capsules containing an uranium-magnesium fuel material were charged in the Materials Testing Reactor on July 28, 1954. Six of the samples contain a matrix of pure magnesium and six contain a matrix of a magnesium-1.4 weight percent silicon alloy. All samples contain approximately 50 volume percent uranium. Two samples of each matrix material will be irradiated to the equivalent of 1000, 5000, and 10,000 MWD/T. Following these exposures, the samples will be examined metallographically and subjected to bend tests to determine the effect of the prolonged irradiation on the properties of this fuel material. During irradiation the specimens will generate approximately 16.3 kw/in^3 as compared to 1.75 kw/in^3 for a Hanford slug. Approximately three weeks will be required to obtain the 1000 MWD/T exposure.

Upon decanning some of the 1/4-inch thick beta heat treated wafers from PT-105-3N, which were irradiated to obtain metallographic and hardness data, it was found that they exhibited surface irregularities. Therefore, metallographically it was not possible to locate the original grains that were photographed prior to irradiation. One wafer was then lapped down to provide a smooth surface for further studies. Hardnesses taken on this wafer indicated an increase in Brinell hardness from 206 for the unirradiated to 318 for the irradiated material.

The exposure value of 310 MWD/AT for the uranium tensile specimens of PT-105-3N has been corrected for the "flux rise" due to the smaller sample size compared to standard slugs. The corrected value is 620 MWD/T, corresponding to about 0.07% total burnup.

Zirconium Metallurgy

The tensile properties have been determined for the first group of zirconium samples from PT-105-509-SI exposed in a process channel at 50-60 C to approximately 190 MWD/AT (6×10^{19} nvt). The tensile data were compared before and after irradiation for 0, 9, 20, 31, 39, and 50 percent cold worked specimens. Irradiation increased the tensile strengths by 6,000-10,000 psi, corresponding to approximately 10 percent increase for all conditions investigated. The effect of irradiation on yield strength was much greater percentagewise. The increase in yield strength varied from 10,000 to 16,000 psi. The percent increase was 50 for 0% cold worked, 16 for 9%, 16 for 20%, 12 for 31%, 15 for 39%, and 11 for 50% cold work. Elongation in a one-inch gage length decreased markedly at zero cold work but was relatively unaffected at the higher levels of cold work. Irradiation decreased the annealed specimens elongation from 33 to 23 percent. Nine percent cold work specimens only decreased from 19 to 14 percent, and at 50 percent cold work, the decrease was from 10 to 9 percent. Changes in the reduction in area were variable, with increases observed in some instances and decreases in other instances. No significant difference was observed in the modulus of elasticity due to cold work or to irradiation. As anticipated, the yield-tensile strength ratio increased with cold work, and all ratios on irradiated specimens were higher than was true for the unirradiated specimens with the same degree of cold work.

Two test specimens of Zircaloy-2 were exposed to F-Pile irradiation and atmosphere at 575 to 625 C for 13 days and at 650 C for 13 days; these samples displayed a surprising lack of scale (the specimens retained their original bright metallic

luster). On subsequent examination it was found that the average weight gain of these specimens amounted to 2.6 percent, corresponding to 13 atomic percent. This gain in weight is believed to be due to the solution of oxygen in the zirconium lattice. Since concentrations of oxygen in pure zirconium as low as 2 or 3 atomic percent reduce the ductility from approximately 30 percent to 3 percent, it is apparent that 13 atomic percent of oxygen will produce a very brittle material with a very low notch ductility. It is possible that some of the weight gain may be due to absorption of carbon, but this, too, would adversely affect the notch ductility of the specimens.

A zirconium wire exposed in tube channel 2785-C in C-Pile for 20 days at 550 C and subsequently for 7 days at 580 C, did show a scale deposit even though the temperature was lower and the atmosphere contained less CO_2 than was the case in the F-Pile test with Zircaloy-2. Apparently, diffusion of oxygen into the zirconium in C-Pile was slower than the accumulation of ZrO_2 on the surface, whereas, at the higher temperature in the F-Pile, the Zircaloy-2 specimens dissolved the oxide as fast as it was formed.

Impact and sheet specimens of Zircaloy-2 exposed in the "H" recirculating water loop at 120 C did not display significant changes in length, weight, hardness, or impact strength. The low activity after two months' decay indicates that the specimens were too far downstream to be exposed to an appreciable flux.

The effect of time and temperature on the solution of zirconium's surface oxide into the metal insofar as it affects adsorption of hydrogen is being investigated. Initial results indicate that a 1/16-inch Zircaloy-2 sheet held in vacuo at 500 C for one hour, then exposed to sufficient hydrogen at 400 C to correspond to a concentration of 200 ppm will sorb 94 percent in one hour and 99 percent in 1-1/2 hours. A specimen heated initially in vacuo at 800 C for one hour, then exposed to the same quantity of hydrogen at the same temperature will sorb 97 percent in five minutes and 99.9 percent in ten minutes.

The rate of growth of a Zircaloy-2 rod in air as a function of temperature has been determined. This growth rate can be expressed by an equation: % growth = K(time in hours) where K varies with temperature from 1.4×10^{-3} at 665 C to 1.3×10^{-2} at 750 C. These rates are lower by a factor of 100 than those observed for sheet specimens, indicating that specimen geometry is a significant variable.

Metallurgical Techniques

Uranium-aluminum diffusion couples have been joined by hot pressing after clean surfaces were obtained by vacuum cathodic etching. A diffusion bond of 0.006 inch was obtained by this technique, whereas unetched specimens exposed to the same conditions of hot pressing did not form a diffusion bond. Beta heat treated dingot metal, Zircaloy-2, and crystal bar zirconium are being prepared to determine their bonding behavior after cathodic etching and pressing.

The effect of water penetrating a Zircaloy-2 capsule and reacting with NaK has been investigated by drilling a 0.010-inch hole in the capsule, then exposing in an autoclave for 144 hours at 190 C. No evidence of a violent reaction was observed, but there was some weight gain. The experiment will be repeated with a larger opening in the capsule to determine the effect of hole size.

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Attempts to obtain photographs of a preselected area in a Faxfilm replica were unsuccessful. The silicon monoxide film deposited on the Faxfilm shifted laterally during the dissolution of the Faxfilm so the predetermined area was no longer in the same position. Additional attempts will be made to develop the technique since it would be very advantageous to utilize this method in the interpretation of micrographs of unirradiated and irradiated specimens.

Fuel Element Studies

The four enriched, cored slugs, which were charged in the hot spot in C-Pile during February, were discharged on July 5, following a rupture of one of the test pieces. Examination of the slug in the basin showed that the downstream test piece had suffered a split-type rupture. The other three test slugs were intact and appeared to be in good condition. The slugs had accumulated 1550-1600 MWD/T exposure and had operated at 75-79 kw/ft power generation during the exposure period. The slug which failed occupied the downstream position in the tube and may have received a considerably higher exposure than that given above due to the high flux intensity at this position. This improved fuel element performance might be compared with the behavior of columnar charges of similarly enriched solid slugs(1) which operated at only slightly higher specific powers and incurred an average of one rupture in four slugs at an exposure level of 650 MWD/T. The ruptured slug and the three test pieces are being transferred to the Radiometallurgy Building for detailed post-irradiation examination.

Four 4-inch mechanically bonded fuel elements were charged into D-Pile on July 23, 1954. The slugs were canned by drawing a heavy walled cup onto the anodically roughened slug and were closed by upsetting the heavy can wall section extending above the slug. No fusion weld was used on the test pieces. Two of the slugs are scheduled to be discharged after an exposure of approximately 200 MWD/T and the remaining two will be discharged after 600 MWD/T exposure. A careful post-irradiation examination of these test pieces is planned to determine the extent of diffusion at the uranium-aluminum interface which may have occurred during pile irradiation. Two similar slugs will be charged in the in-pile H-loop facility on August 9, 1954, for evaluation studies at 150 C pile coolant temperatures.

Destructive out-of-pile tests have been performed on mechanically bonded fuel elements in the 100-D flow laboratory. Two slugs, one having a hole drilled through the jacket at the center of the piece and one having a hole drilled through the cap end, were exposed to 120 C water in the flow laboratory. The slug having the hole in the center withstood 30 hours' exposure before it was discharged. Severe blistering of the jacket due to corrosion product build-up occurred during this thirty hour exposure. The remaining slug was discharged after an exposure of 300 hours and exhibited similar blistering of the jacket.

Twelve 4-inch unbonded slugs have been canned using the cold canning, point closure technique. The solid uranium slugs had a centerless ground surface and were pickled the day before canning so that a layer of uranium oxide was present on the slugs at the time of canning. This preparation results in an unbonded fuel element with a thin oxide layer separating the uranium and aluminum. Two of the slugs are being

(1) Lang, L. W., Production Test 105-532-A-4, Irradiation of Enriched Uranium Slugs, HW-30450, January 5, 1954 (Secret).

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destructively tested in the 100-D flow laboratory to determine the mode of failure upon water penetration of the aluminum jacket. Eight of the remaining fuel elements will be charged in a Hanford reactor to evaluate the pile performance of unbonded uranium fuel elements.

The cold canning technique has also been successfully applied to the canning of cored uranium slugs. Point closures were formed on cored uranium pieces without any appreciable distortion of the core dimensions. It is planned to fabricate four enriched cored slugs by this technique for pile testing and evaluation.

Fuel Element Testing Facility

Operation of the fuel element testing facility commenced on August 1, 1954, with the "A" block in the A-29 MTR reflector position. The observed power generation reported by Arco personnel was 60 kw/ft. It is planned to move the "A" block containing the three Hanford fuel elements to a higher flux position as soon as possible to achieve a higher power generation. The three fuel elements being irradiated in this facility are: a cored, Al-Si bonded slug; a standard Al-Si canned slug; and a hot-pressed, nickel-coated slug.

PT-25M Ruptures

Examination work continued on the ruptures which have occurred in Production Test 25M to evaluate uranium slugs machined from salt bath heat treated Fernald rolled rods. Three of the ruptures, Nos. 339, 353, and 362, were transversely and longitudinally sectioned to provide samples for further detailed work. On all the longitudinal sections taken two inches from the cap end, small longitudinal cracks could be seen near the slug axis which were indicative of manufacturing defects.

Two normally discharged slugs from PT-25M and two normally discharged slugs from Production Test 3M to evaluate salt bath heat treated slugs were examined to observe the relative dimensional stability of the ruptured and non-ruptured slugs after irradiation. Profile measurements of the ends of four of the 25M ruptured slugs and the four aforementioned normally discharged slugs indicate that the 25M material has concave ends to as much as 0.030", while the ends of the 3M material remained essentially flat. The total length of the slugs as measured at the periphery of the slug indicated the same amount of overall length change for both types of material.

Two cross-sectional wafers, cut from a ruptured 25M fuel element, were studied by x-ray diffraction techniques in an effort to relate crystallographic characteristics with a mechanism of deformation. One wafer had occupied a position two inches from the ruptured end of the slug, while the other was taken from the extreme end opposite the failure. Ten positions along each of two diameters 90 degrees apart were studied for both specimens. Six crystallographic planes were investigated at each position. The highest orientation values as well as the maximum variations in readings were noted for the (020), (110), and (200) planes. It has been observed that preferred orientation in the (020) and (110) planes tends to promote growth during irradiation, while preferred orientation in the (200) plane is accompanied by shrinkage; however, preferred orientation in all three planes may lead to a dimensionally stable material, depending on the proportion of the three preferred orientations. In the case under consideration, there were no definite indications of instability, based on the preferred orientation values.

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One suspect rupture slug from which gas bubbles were observed to be escaping in the 105 Basin was carefully examined in a cell. No evidence of rupture was found.

Radiometallurgical Examination

Tensile tests were completed on 90 irradiated and unirradiated samples of rubber and plastic gasketing materials proposed for pile use. A reduction in elongation and ultimate strength was found after irradiation for all of the 16 types of materials tested. The Huntington Buna-a, Hewitt-Robbins 40230 GRS, and Teflon samples showed but slight reduction in elongation or ultimate strength. The natural rubber, Huntington 408 and 406, and the 62507 Hewitt-Robbins neoprene samples were completely decomposed.

Examination of samples of radioactively contaminated plastic KEL-F which were received from Separations Technology for a study of the effect of radiation on the physical and mechanical properties was completed. Tensile testing of the specimens revealed that the ultimate strength was decreased by approximately a factor of two after a radiation exposure of 10^8 R in HAX solution. A report is in progress.

In connection with a study to determine the best methods for obtaining a bright field etch of irradiated uranium, a tartartic acid-sulfuric acid electrolyte was tried. A sample from a wafer cut from a slug exposed to 624 MWD/T was etched and the metallographic structure successfully delineated.

Sixteen uranium specimens, representing four exposure levels of one hour, six hours, twenty-four hours, and fourteen days, have been discharged from the 100-B reactor. These samples have been irradiated in a low flux zone of the pile with special precautions being taken to prevent an increase in temperature of greater than 10 C above inlet water temperature. At the present time these samples are stored in the Radiometallurgy Laboratory and will be examined for crystallographic damage as soon as the work schedule permits.

Radiometallurgy Facilities and Equipment

The density measuring equipment which provides a precision of 0.3 mg/cm^3 was completed and measurements of radioactive zirconium and uranium begun. In order to provide for easier manipulation of the cathodic etching equipment within the cell, the ion discharge tube was modified from a spherical shape to a cylindrical shape. This equipment is now being tested to determine the validity of this design modification in obtaining satisfactory metallographic specimens. Construction of high-temperature tensile testing equipment for radioactive samples was started. The vacuum chamber seal has been tested to <1 micron vacuum and found satisfactory. The shafts which transmit the load to the sample are water cooled to avoid heating the seals when testing up to 700 C.

Separations Plant Corrosion Problems

Previously reported data on general corrosion and pitting corrosion of SAE-1020 specimens exposed in Redox waste storage tank No. 104, 241-S, indicated that no serious damage from general or pitting corrosion has occurred. Recent examination of a stressed specimen which had been exposed for nine months showed no evidence of stress corrosion cracking. Thus, stress corrosion cracking, if it occurs at all, must develop slowly.

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Six specimens of type 309SCb stainless steel were corroded in synthetic D-12 waste concentrate at 165 C using the new heat transfer equipment. This test in duplicate served as a calibration run as well as verification of a single point on the previously reported corrosion rate vs. temperature curve (HW-30896). From these exposures it appears that the preliminary curve may be somewhat low and that the temperature dependence of the corrosion rate may be greater than the curve presented in HW-30896 indicates.

Three new materials have been evaluated as possible materials from which process lubricated bearings might be fabricated. They are chromium carbide, hardchrome plate, and grade CS-312 fused graphite. Of the three materials, only the grade CS-312 fused graphite shows any promise for this application.

Welding Studies

Weldability tests on low carbon-low alloy steel plate contemplated for use in construction of the replacement downcomers for 100-B and 100-D Piles were continued. Previously, plates welded with E6016 electrodes were fabricated from the materials under test (Mayari-R, Yoloy, Corten) and subjected to bend and tensile tests. These same materials have been welded with E8016 electrodes and subjected to similar tests. Metallographic examination of specimens cut from the weld and heat affected zones as well as from the flame cut edges of all samples was made and appropriate pictures taken of representative areas. Results of the examination indicated that Mayari-R welded with E6016 gave the best results, and a letter to this effect was written to J. R. Wolcott of Design.

Further sample plates were fabricated for bonding in an effort to derive a test to be included in specifications for ordering the steel plate. These tests indicate that any plate to be used for this service should pass all standard ASTM specifications for welded plates in addition to passing a special test derived here to show the resistance of the plate to notch brittleness. Metallographic examination indicated a band of martensite completely surrounded the weld bead at the fusion line and was about 0.01" thick on all samples. In most cases, the martensite was interspersed in a ferritic matrix adjacent to the weld bead; however, at the flame cut edges for a distance of about 0.01" a completely martensitic region existed in all samples. These structures are to be expected from welding this type of steel without any preheat or postheat treatment. Samples from successfully welded plate were supplied to R. S. Dalrymple of Fuel Technology for stress corrosion testing.

Plutonium Metallurgy

Dies for experimental bonding of uranium to plutonium were completed. Using aluminum as a stand-in for plutonium, mechanical bonds equal to the yield strength of aluminum have been produced. Mechanical bonding with plutonium will now be attempted. Trials of diffusion bonding of plutonium and uranium are also under way.

Calibrations were continued on the quartz plate interferometer dilatometer. The thermometer portion of the bottom plate was calibrated by using the alpha-quartz to beta-quartz inversion point at 573.3 C as a base point. The vibration troubles experienced during some of these trials have been located and minimized by isolating the hood from surrounding structures.

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The vacuum system for the cathodic vacuum etch apparatus has been completed and is being tested for leaks. The unit will then be tested using specimens of non-radioactive metals.

Preparations were completed to furnish ORNL with five circular cylinder test pieces to be used for dissolver studies. This work is scheduled for completion by August 15.

Thermal cycling of type 309SCb stainless steel used for plutonium reduction bomb construction over the operating temperature range results in sigma phase precipitation at a faster rate than at constant temperature. Tests evaluating the influence of sigma phase on the properties of 309SCb are continuing.

PHYSICS

Lattice Physics

The large exponential piles were moved from Bldg. 189 in 100-D Area to Room 24-A, Bldg. 326, 300 Area. The standard pile and the 5-3/16" lattice exponential unit have been erected and are ready for measurements. Construction will begin shortly on the 7" lattice unit. The small exponential piles (4' x 4') have been moved to Room 15-17 in Bldg. 326. The 8-3/8" lattice has been constructed in this room also.

Slugs of the following dimensions have been loaded into process tubes: 1.66" O.D. by 1.10" I.D.; 1.66" O.D. by 0.810" I.D.; and 1.66" O.D. by 0.00" I.D. These three types of slugs will be measured in a 10-3/8" lattice, which is obtained by inserting graphite cylinders in alternate holes in the 5-3/16" lattice.

The flux distribution as a function of radius has been calculated for the Lattice Testing Reactor. These calculations indicate that the central flux will be 1.3×10^7 neutrons cm^{-2} sec^{-1} when the core is filled with graphite and will be 8.3×10^6 neutrons cm^{-2} sec^{-1} when the core is filled with the standard 8-3/8" lattice.

Consideration has been given to changing the design of the fuel elements of the LTR. In considering a possible incident in which all the fuel is vaporized, the presently contemplated uranium-aluminum alloy fuel elements are undesirable because of the high pressure which may be produced in the reactor room. This pressure buildup would result from the high heat of vaporization of the fuel elements and the heat of combustion of the vaporized fuel elements. This situation can be improved by using fuel elements with a lower heat of vaporization and a lower heat of combustion; a possibility is UO_2 suspended in lead.

Bids have been opened for the building to house the Lattice Testing Reactor and the Thermal Test Reactor. The low bid of $74,900 was accepted by AEC.

Further studies have been made on the possibility of using UO_2 fuel elements in a K-type pile. Calculations have been made to determine the enrichments required to bring the reproduction factor $\underline{k}$ up to 1.05 for three UO_2 densities. New conversion ratios were calculated based on UO_2 slugs enriched to the appropriate degree. For the case of enriched UO_2 slugs having a density of 9.82 g/cm^3, a cold clean conversion ratio of 0.69 was obtained. This may be compared with the conversion ratio

of 0.835 for the older HAPO piles operating with metal slugs. The loss in conversion ratio which must be suffered if such UO_2 slugs are used reduces the annual production of a 3000 MW K-type reactor operating 86% of the available time from 886 to 727 kilograms of 200 MWD/T plutonium. Advanced Engineering Section estimates of the allowable fabrication costs, i.e., competitive with metallic fuel, for converting Hanford depleted uranium to the 9.82 g/cm^3 enriched oxide for use in this reactor ranged from $1.13 to $1.32 per pound, depending on which of the four processes considered was used. This estimate was based on an assumed 200 MWD/T plutonium as the final product. More details may be obtained from HW-32522, "Allowable Costs for UO_2 Fuel Elements in K Piles", by H. Neumann.

The work in progress on the variation of the Pu-240 isotopic concentration with pile operating temperature will be finished shortly. The variation of local concentration with local MWD/T and pile temperature has been published (Quarterly Report). Integration of the local concentration over a process tube, taking into account the variation of concentration over the rod radius and the length of the tube, is almost completed. A similar type of calculation for conversion efficiency is in progress. Preliminary results indicate that an effective neutron temperature and a value of the resonance escape probability can be obtained from such an analysis.

It is apparent from the calculations performed thus far that there is to be expected a measurable variation in the apparent graphite temperature coefficient with the amount of Pu-239 in the pile. This is due to the fact that the Pu-239 fission cross-section increases rapidly with neutron temperature. This effect produces a substantially increased slope in the long term gains curve as the reactor temperature is increased. Additional work on the problem of reactivity changes as a function of exposure and pile temperature should yield a pile cross-section for Pu-240 and give added insight into the problem of reactivity changes for exposures up to about 2000 MWD/T.

New general formulas for the reproduction constant k and the conversion ratio for lattices were developed. These formulas take into account the fact that some epithermal neutrons are absorbed in U-235 and thus produce epithermal multiplication in U-235 as has been observed by M. V. Davis in the Test Pile.

A study was made of the currently used method of estimating the reactivity effect of xenon in production piles. This study resulted in a recommendation for simplifying the numerical tables used as described in HW-32543, "Repetition in the Xenon Tables", by J. O. Erkman.

Work was initiated on calculating the thermal blackness of slugs by studying the fate of neutrons entering a slug in terms of generations, where a generation is defined by the number of collisions the neutron has suffered in the slug. For instance, the zeroth generation consists of neutrons which have entered the slug but have not made a collision. Collision densities as a function of slug radius were made for the zeroth generation.

A resonance capture experiment was performed using a single column of cadmium-shielded J slugs in an exponential pile. Flux measurements were made as a function of distance from the column using gold foils surrounded by cadmium as resonance detectors. A large flux depression was observed in the vicinity of the J slugs.

Applied Research Sub-Section

Nuclear Physics

Measurements of the total cross-section of U-235 and the fission cross-section of both U-235 and Pu-239 have been made at high energies. The total cross-section measurements were made in the range 0.1 ev to 0.6 ev; and the fission cross-section measurements, in the range 0.1 ev to 1.35 ev. It was interesting to note that no resonance in the fission cross-section of plutonium was observed at 1 ev. The plutonium used in these measurements contained 4.6% Pu-240. If as much as one-tenth of the large Pu-240 resonance total cross-section at 1 ev were associated with a fission process, then the present measurements should have indicated a resonance at 1 ev.

The MTR irradiation of a cadmium-shielded plutonium sample was completed July 28. This sample will be used to try to determine the feasibility of selectively burning out Pu-240 in production plutonium by neutron irradiation.

Two bismuth trifluoride slugs were canned. One of these will be charged into a production pile in the near future. The purpose of this irradiation is to examine the feasibility of making neutron sources for experimental work by this method.

A study of the uncertainties to be expected in the measurement of the absorption cross-section of Np-239, which E. M. Kinderman of the Chemistry Unit has undertaken, revealed that the limiting uncertainty is in the knowledge of the decay scheme of Np-240. Because of this, the radioassay of Np-240 will be uncertain to 17%.

The wiring of the control and safety circuits of the Thermal Test Reactor mock-up was completed.

Drawings were completed and construction has begun on a step plug to go in the K-east reactor shield. This plug will allow a collimated neutron beam to emerge from this reactor.

Plant Physics

Discussions with Dr. Dixon Callihan at Oak Ridge National Laboratory resulted in agreement on a series of experiments which will be useful in evaluating the nuclear safety of Hanford separations plants processing slightly enriched uranium. Criticality experiments will be performed by Callihan using uranium rods in a series of water-moderated lattices. The rods will be eight feet long and will have diameters ranging from 0.25" to 1.50". They will contain 2% U-235. The data obtained will establish the critical radius for an infinitely long water-tamped cylinder containing the test lattice. From this the critical diameter of an infinite cylinder can be determined as a function of the hydrogen to uranium ratio. Curves for a given hydrogen to uranium ratio showing critical cylinder diameter versus rod size will be extrapolated to zero rod diameter to obtain the information required for homogeneous solutions. The reason lattices are used rather than homogeneous solutions is that the limited solubility of uranium compounds makes it difficult to get sufficiently high uranium concentrations.

A recommendation was made on the placement of new valves in the Recuplex process so as to minimize the nuclear safety hazard associated with the reflection of neutrons into the process tanks.

Applied Research Sub-Section

Consideration was given to the changes in pipe diameters which might be permissible if high exposure plutonium were to be processed in a separations plant. The results were that plutonium containing 20% Pu-240 and 4% Pu-241 by weight could be handled in 7-1/2" diameter water-tamped pipe. For comparison, the permissible diameter for 400 MWD/T plutonium (about 3% Pu-240) is 5.7".

Work was done on the theory of isotope separation. An attempt was made to extend the present theory on isotope exchange equilibrium constants in gases to include solids also.

CHEMISTRY

Thorex

Further investigation of electrolytic dissolution of thorium metal has been made in an unsuccessful attempt to reduce the amount of fluoride required for the dissolution of thorium slugs. Sixty-cycle alternating current was used in the hope that rapid polarity changes would prevent formation of the oxide. Electrolysis in 6 M HNO_3 - 0.001 M HF produced a 5 g/l thorium solution in two hours. However, 40% of the thorium removed from the piece being electrolyzed remained as a gray precipitate, presumably the oxide.

Since fluoride ion continues to be required for thorium metal dissolution, inhibition of fluoride corrosion of stainless steels remains of interest. Zirconium has previously been found to be the most promising additive for this purpose, and its effect has now been determined as a function of concentration. For 309SCb, 304L, and 347 stainless steels in 13 M HNO_3-0.1 M HF (an intentionally exaggerated fluoride concentration), the corrosion rates in 0.2, 0.1, and 0.05 M Zr(IV), and in the absence of zirconium were 2, 3, 4, and 45-fold greater, respectively, than the stainless steel corrosion rates found in the absence of fluoride ion.

Purex

Decontamination data at 70 C were obtained in a two-cycle Mini mixer-settler run with Ultrasene diluent, following a modified HW #2 flowsheet which resulted in 65% saturation of the HAP. Following boildown of the HCP, a second cycle employing the IA bank only was operated. Overall two-cycle decontamination factors for ruthenium, zirconium, and niobium were 2×10^6, 2×10^2, and 4×10^4, respectively. Although the ruthenium activity was well within specifications, the poor zirconium and niobium decontamination factors rendered the product far out of specifications. A room temperature IA cycle following a high temperature first cycle is currently being investigated.

Since UX_1 has been shown in Mini runs to follow plutonium in the Purex HA, IA, and 2A columns, further runs were performed to test the split in the IB column where most of the separation must be obtained. Using feed from Chemical Development, a IB unit with 12 extraction and 7 scrub stages was operated for ca. 20 hours, and a steady state decontamination factor for UX_1 of 50 was obtained. Increasing the IBX acidity from 0.1 M to 0.5 M HNO_3 resulted in a decontamination factor of 250. Thus, satisfactory removal of UX_1 from the plutonium stream in the IB column is expected.

Applied Research Sub-Section

The operating diagrams for uranium, nitric acid, and plutonium were determined for a Purex "A" column operated at 70 C. A dual scrub and a single scrub flowsheet were tested in batch countercurrent runs employing eight scrub and four extraction stages in both runs. The results indicate that Purex "A" columns operated at 70 C with organic flow adjusted to yield a product uranium saturation of 65% should give satisfactory recovery of both uranium and plutonium and should be "safely" operable with scrub flow ratios presently specified for 25 C operation.

There has been some concern that operation of Purex at elevated temperature may permit oxidation of ferrous ion and plutonium in the IB system, resulting in poor uranium-plutonium partition. Accordingly, the rate of oxidation of sulfamate-protected ferrous ion and the associated plutonium distribution ratios were determined in simulated Purex IBX-IBS column systems at 60 C. In all cases studied, up to 3 M HNO_3 for five hours, the ferrous ion oxidation rates are sufficiently low to permit the E_a° values for plutonium to remain constant and low, as desired for successful partition column operation.

If operation of Purex "C" columns at higher temperatures would permit stripping to higher final uranium concentrations, an increase in uranium processing capacity could be achieved for the uranium concentrators in addition to the increased capacity attained for the column itself. Initial feasibility tests indicated that operation of "C" columns at 70 C would permit sufficient reduction in aqueous flow to yield a product uranium solution which could be processed at a rate of 25 tons U/day in the phase I uranium concentrators, at least with a dual scrub "A" column as specified in the HW #3 flowsheet.

Stripping of the plutonium from the organic phase in the "HC" column is likely to be the step in the process most sensitive to the presence of dibutylphosphate and other degradation products. Plutonium stripping tests following batch contacts of systems simulating the extraction and scrub sections of the "HA" column have been made. Preliminary results indicate a slight but tolerable increase in the amount of unstripped plutonium in the high acid-high uranium scrub section at 70 C for periods up to four hours. Similar results were obtained for a high acid-low uranium extraction section for a one hour exposure, but a hundred-fold increase in unstripped plutonium was found following four hours at 70 C. Although it appears that the rate of formation of DBP in the "A" column will permit high temperature operation, subsequent investigations are continuing.

HA column runs at room temperature tested the effect of solvent saturation on capacity, with Spray Base diluent and with Ultrasene. With Spray Base, decreasing the saturation from 70% to 55% increased the flooding capacity by ca. 25% but with no increase in uranium throughput. Although there was no variation in flooding capacity with solvent saturation using Ultrasene, the capacity with this diluent at 70 and 55% saturation was 50% higher than that with 70% saturated Spray Base due to the coarser dispersion.

Waste Treatment

Scavenging of long-lived fission product activity from fresh Bismuth Phosphate first cycle waste has been successfully demonstrated using the nickel ferrocyanide precipitation procedure at pH 9. Whether scavenged separately or following pooling with coating removal waste, the residual radiocesium and strontium activities in

the supernatant solutions were well below the 0.1 uc/ml tolerance for cribbing. The solid resulting from this scavenging has a centrifuged volume 20% or 30% that of the aqueous waste for first cycle waste alone, or pooled first cycle and coating removal waste, respectively.

Isotope Separations

In order to provide faster and more precise analytical service for the isotopic separations program, the Consolidated mass spectrometer is being converted for uranium isotopic analyses. In addition, a six-unit sample fluorination line has been constructed and tested, and a sample purification procedure has been selected. A rigid procedure for sample purification, fluorination, and mass spectrometric analysis will be followed to insure the highest precision. An alternate isotopic analysis method which consists of the absolute counting of the U-235 0.184 mev gamma from a weighed sample is under investigation. The sample must be previously freed of uranium daughters and must not contain U-237 or any measurable amount of fission products.

Neptunium Cross-Section

A special pre-amplifier for the 20-channel analyzer has been designed, fabricated, and tested for use in the neptunium neutron cross-section experiments to enable location of the pulse analyzer at a distance up to sixty feet from the counter and hot separations facility.

Preliminary experiments have indicated that a successful method has been developed for the separation of neptunium from plutonium by means of a TTA extraction employing stannous ion and hydroxylammonium ion as plutonium reductants.

In-Line Analysis

Of the equipment being fabricated for the Hot Semi-Works installation, the gross gamma and gamma spectrometer consoles are about 95% complete, and the gamma sensing units have been completed and tested, but the uranium photometer, uranium polarograph, and pH consoles will not be available until about October 1 because of the electronic shop workload. The degassers for the gamma installations are fabricated and under test, the gamma cell shielding has been tested and found adequate (three inches of lead required), and the gamma cells (Lucite) were tested and found to be mechanically acceptable. Regarding the gamma cells, laboratory tests of the contamination problem were made using Purex HAP, HCP, and HCW solutions. It was found that the cell contamination after drainage was about 8% of the net sample reading and was about a factor of three lower than this after flushing with Spray Base. The tests also indicated that a 100-fold transient in sample activity would probably require replacement of the cell. All required shop drawings for the program have been completed, and wiring and conduit installation in the Hot Semi-Works is under way. A status report was issued during the month as document HW-32541 (Confidential).

Assembly of the equipment for an in-line gamma monitor on the Redox 2DU sample has been completed. A Cs-137 source for calibration was included and the range available is 100 microcuries to 300 millicuries per gallon.

Applied Research Sub-Section

Analytical Development

A study of the flame source method for the direct spectrographic analysis of pile process water revealed that the sensitivity for iron and copper is comparable to that of existing colorimetric methods, but aluminum is not detectable in the range desired. Spectrographic methods for water analysis, using the inexpensive medium Hilger instrument, have potential economic value because many elements could be determined simultaneously on one sample, thus saving much analytical time over existing colorimetric methods.

A study of the fluorimetric method for uranium to increase precision was started using the new Purex model fluorimeter. An appreciable improvement in the inherent precision of the instrument was obtained by adjusting the lamp to give uniform sample illumination, providing means of more positive and precise positioning of the sample disc wheel, fabricating of suitable fluorescence standards to reproduce instrument settings from day to day, and eliminating phototube fatigue due to overloading on high emission samples. In the studies of the sample preparation steps, the preliminary work indicated that furnace fusion of samples (sodium fluoride plus sample) offers some advantages over induction heating due to reduced warpage of dishes, and improved uniformity of the fused buttons. Annealing or slow cooling of the buttons also seemed to increase reproducibility.

A thermal extraction method for hydrogen in zirconium has been set up and satisfactory operating procedures established. The method, which can detect less than 2 ppm of hydrogen in zirconium metal with samples up to one gram, has been made available to the General Analytical Control Laboratories Unit. Accuracy cannot be evaluated since standards are not available, but the precision is ± 0.2 ppm absolute at the 12 ppm level and about ± 0.5 ppm absolute at higher levels. The time required for a determination varies with the size and shape of sample and may be as great as one hour for a one gram sample.

A coulometric titration is currently being used for the plutonium analysis of F-10-P solutions in the routine control laboratory. The success of this analytical method prompted an investigation to determine the feasibility of employing this type of analysis for plutonium in dissolver solution. The adoption of a dissolver solution-plutonium analysis would greatly simplify plant accountability in that problems associated with specific activity, americium and curium content, and absolute alpha counting would be greatly reduced or eliminated. The results obtained on pure plutonium nitrate samples show that two micrograms of plutonium can be determined with a standard deviation of ± 4%. This is the approximate amount of plutonium in a ten microliter sample of dissolver solution. For larger amounts of plutonium, the precision improved: for 10 micrograms the standard deviation of a single result is ± 0.6%. The method shows no bias and is not interfered with by iron, nitrate, or chromium. Investigation is continuing in an attempt to obviate an unexpected interference caused by uranium.

The flame photometric method for TBP has been extended to aqueous uranium samples using solvent extraction followed by flame spectrum analysis. The method is applicable to the range of 0.25 to 5.0 mg of TBP with a precision of better than ± 0.2 mg absolute, and it can replace the existing infrared method, with which it is comparable in speed and precision.

Applied Research Sub-Section

The standard sample program involved 71 determinations from 100, 200, and 300 Area service laboratories. These included test samples of process water, 70-58 in Pu, U and HNO_3 in RAW and 3EU, and Al and HNO_3 in Redox scrub make-up. Results ranged from acceptable to excellent.

Waste Disposal and Laboratory Decontamination

One million gallons of "retention" level waste from the Works Laboratory Area were processed to ground, and fifty thousand gallons of "crib" level waste were transported to 200 West Area for disposal.

Two filter traps from "cut-off" boxes originating in Building 327 were discarded by concreting in dry wells in the 300 Area Technical Burial Ground. This procedure, described in last month's report, reduces personnel exposure during the disposal operation and prevents the leaching of high level material to ground.

Thirty-two manhours were spent doing special decontamination work in cubicle room 1-F, Building 222-S, and all other decontamination, laundry, and building service functions were accomplished in a routine manner.

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 July, 1954, except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

Inventor(s)	Title
Lee F. Miller	An Electromagnetic Pump

F W Albaugh by FDZ

Manager - Applied Research
ENGINEERING DEPARTMENT

FWA:FJL:kb

G-1532. 1-D

GENERAL ELECTRIC COMPANY

[redacted]

HW-32624 [redacted]

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

August 4, 1954

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_____copies. Series A .

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

JULY, 1954

[redacted]

VISITORS AND BUSINESS TRIPS

Name	Date	Address	Purpose
J. C. Woodhouse	7/1/54	du Pont, Wilm.	Advisory meetings
J. Drober T. Stephens	7/12-13/54	N.Amer.Aviation, Downey, Calif.	Testing discussions
J. U. Shepardson S. M. Tuthill	7/13-14/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Testing discussions
E. R. Astley	7/26-27/54	G.E.Co.,Schenectady	Interview for employment
W. M. Leaders	7/26-27/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Uranium quality and fabrication

Name	Date	Place Visited	Purpose
G. E. McCullough	7/9-20/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Metallurgical Development Advisory Committee
		G.E. Association Island, Pierpont Manor, N. Y.	Personnel training
P. J. Pankaskie	7/10-17/54	Babcock & Wilcox, Pittsburgh, Pa.	Zirconium fabrication
		KAPL, Schenectady	Zirconium fabrication
		MIT, Cambridge, Mass.	Zirconium fabrication
		Bridgeport Brass Co., Co., Bridgeport, Conn.	Zirconium fabrication
		Superior Tube Co., Philadelphia, Pa.	Zirconium fabrication
G. S. Allison	7/12-14/54	Bremerton Navy Yard, Bremerton, Wash.	Fabrication of equipment
L. J. Lucas	7/17-27/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Machining of uranium
G. S. Cochrane	7/25-31/54	Udylite Corp., Detroit	Machine design
R. G. Post	7/25-31/54	Udylite Corp., Detroit	Machine design

ORGANIZATION & PERSONNEL

Personnel totals as of July 31 were as follows:

	Exempt	Technical Graduates Permanent	Technical Graduates Rotational	Non-Exempt	Total
Fuel Assembly Unit	18	1	--	14	33
Fuel Element Development Unit	13	2	2	9	26
Fuel Evaluation Unit	14	--	--	13	27
Coatings & Corrosion Unit	11	1	1	6	19
Testing Methods Unit	7	--	1	3	11
Technical Shops Unit	4	--	--	27	31
Administration	1	--	--	5	6
Totals	68	4	4	77	153

FUEL COMPONENT DEVELOPMENT

URANIUM QUALITY

Hydrogen in Uranium

The investigations of hydrogen in uranium cores and canned slugs were continued to obtain further background data for a decision whether uranium should be outgassed prior to canning in order to reduce core failures during irradiation. Concurrently, uranium is being prepared by the National Lead Company for a Hanford production test to evaluate the effect of hydrogen in uranium on the tendency of slugs to fail. This test will also evaluate the woodsplitter's ability to predict slug performance during irradiation and determine whether slugs do split along the observed zones of maximum work in the rolling deformation pattern.

Slug Warping

Further evidence was obtained to show that both lead-dip and triple-dip slugs tend to warp during pile irradiation in a plane perpendicular to the plane intersecting the tube ribs. In addition to the summary of warped slugs in the body of the report, twenty-nine warped slugs were found in a tube of triple-dip canned pieces. All 12 of the medium and heavily warped triple-dip canned slugs from this tube, irradiated to 1200 MWD/T, exhibited the previously stated warp rib-pattern relationship. Parallel investigations of the metallurgical features of slug warping are being conducted on non-irradiated slugs. The preliminary work thus far completed supports the contention that a stress relief anneal prior to canning should be beneficial in reducing warp during irradiation.

Ingot Quality Studies

In the evaluation of uranium slugs received in conjunction with Ingot Quality Studies, a direct correlation has been found in the available test results

between the reported hydrogen content of the ingots and the canning rejections. Further data are being obtained to check this correlation. Ingot Quality Study #7 indicates an increase in the number of acceptable slugs accompanies derby pickling and an increase in canning yield results from hot-topping of ingots. Both the pickling of derbies followed by casting into hot-topped ingot molds and the use of dingot metal tends to improve the 305 test pile reactivity of the resulting uranium slugs.

Slug Quality

Several slugs with internal defects have been found in recovered canning rejects. It is conjectured that these defects were not found prior to canning by virtue of the uranium having been smeared at the faced slug ends. The presence of such slugs, which very possibly might fail during irradiation, in canning recovery, indicates the need for the application to production use of a non-destructive test such as the MIZ-2 bare slug flaw detector which will detect and reject such slugs prior to canning.

URANIUM DEVELOPMENT

Cored Slugs

The production test to evaluate the rupture behavior of Al-Si dip canned cored normal uranium fuel elements has proceeded to the point that sufficient slugs for two tubes of cored elements and two tubes of companion solid elements are ready for charging in C pile at the next shutdown. The charge for a duplicate test to be irradiated in F pile is being machined. Additional tests in the woodsplitter - water-cooled induction heater - of paired, cored, and solid slugs confirmed the initial data indicating considerable improvement in the number of cycles to failure of the cored slug over the solid companion piece.

Fabrication of Uranium

The fabrication of hollow rods by extrusion at Adrian, Michigan has been scheduled for August 16. Tool development using brass rather than uranium is scheduled for August 2.

Approximately 3500 uranium powder metal compact slugs lead-dip canned last month were prepared for pile charging. Most of the material will be irradiated to 600 MWD/T at F pile. Pilot tube charges of derby and ingot source material will be irradiated at C pile with one tube being taken to rupture to obtain comparative rupture data between powder metal compact slugs and standard rolled beta heat treated metal.

Rods rolled at Fernald from billets cast in zirconium cans at HAPO were received. Tests have been initiated to determine the characteristics of the cladding and uranium in this rod. An attempt was made to cast 12 slugs directly into zirconium cans. Seven of the 12 slugs were well-bonded with the exception of about one-inch at the top of the slug. Additional tests will be performed using higher can pre-heat temperatures to obtain better bonding between the uranium and zirconium.

Uranium Alloys

The uranium 1.5 atomic per cent silicon alloy slugs machined from rods rolled at Fernald continued to show little dimensional change during beta phase cycling in the woodsplitter. An attempt at Fernald to roll a seven-inch ingot made from co-reduced uranium-silicon derby resulted in bursting the entire length of the billet during initial breakdown. The standard FMPC rolling process is not a feasible production method for fabricating the uranium-silicon alloy.

JACKETING COMPONENTS

Uniskanning

During initial trial runs on the new uniskan equipment, it was developed that the pressure pad control system required revision. These modifications were initiated. A program for the evaluation of the uniskan process was initiated; surface quality, mechanical properties, structure and corrosion resistance of uniskanned cans will be determined.

Cold Closure Jacketing

Approximately 32 fuel elements were jacketed by the cold closure technique; these elements will be used by Applied Research for various tests. An order for 500 cups was placed with Hunter Douglas Company for August 15 delivery; these cups will be used for production of some 128 fuel elements by the cold closure technique for pile tests.

Zirconium Process Tubes

Contacts and visits to plants engaged in zirconium process tube development were made. Four of the larger tubes were promised for delivery by October 1. Also, short samples of the smaller tubes were being air shipped to HAPO for corrosion resistance and property evaluations.

FUEL ASSEMBLY DEVELOPMENT

Hot-Press Canning of Uranium

Of the 336 nickel-plated, solid slugs hot press canned for production test, 273 are available for pile charging - a yield of 80 per cent. The largest reject category of 10 per cent was due to marred surfaces caused by the large number of handling procedures required in processing in the development equipment.

Seventeen nickel-plated, cored slugs were hot-press canned for a pre-production test evaluation. Those slugs sectioned after canning showed no significant hole distortion. Those slugs sectioned after severe thermal cycling in the "woodsplitter" showed a bore diameter reduction of as much as 50 per cent. Of the fifteen slugs thermally cycled, only the one with inadequate nickel plating in the counterbore permitted water entry into the bore.

Twenty-six internally and externally cooled, hollow slugs were hot-press canned during the month. Experimental studies to date indicate that a hardened tool steel pin tapered about 0.010 inch in diameter over the slug length, is the most desirable choice of pin material and design. This type of internal pin has been easily removed from quenched slugs.

Tensile tests of simulated hot-press welds indicate that the cycle presently used for hot-press canning nickel-plated uranium slugs (575 C, 12 tsi, 10 minutes at pressure) produces a closure which is bonded approximately 75 per cent of the cap-can interface. This gives a closure with a water entry barrier of approximately 3/16-inch of aluminum. Comparison of weld efficiency between the scrub cleaning method and the dip cleaning method is being made.

Studies of the aluminum can grain size on hot-pressed slugs indicate that a properly processed fuel element will have a grain size no larger than those found in lead-dip canned slugs. Proper processing includes can annealing temperatures of not more than 500 C to prevent large grain formation prior to sizing, minimum sizing reductions of about 20 per cent, and total time in the pressing die of less than about 20 minutes.

Operation of the four-unit gang press continued satisfactorily during the month. All the solid fuel elements for production-test pile charging have been canned on this machine; all the cored pieces for production test will be canned on the four-unit press during August.

Hot-Press Canning of "J" Slugs

Approximately 500 uranium$_{235}$-aluminum alloy, "J" slugs to be used with the forthcoming thorium charge have been hot-press canned in development equipment in the 314 Building. An additional 2000 "J" slugs will be hot-press canned in the new manufacturing equipment in the 313 Building, which should be ready the first part of August.

FUEL EVALUATION

FUEL ASSESSMENT

Slug Burnout Experiments

A mechanism of slug rupture, particularly associated with the side blowout type failure, has been recently proposed by personnel of the Advanced Engineering Section. The postulated failure mechanism involves the following sequence of events: If a flow obstruction occurs in the cooling water annulus, a Venturi effect could be obtained with a resulting area of low pressure on the downstream side of the obstruction. If this reduced pressure is less than the saturation pressure, local boiling will commence. Depending upon the temperature difference between the water film temperature and the temperature of the bulk water, either nucleate or film boiling could occur at the same heat flux. Should film boiling occur, the can surface would be insulated from the water and a rapid rise in can surface temperature would result, leading to melting of the can wall, i.e. "burnout."

To permit an evaluation of this failure mechanism, data pertinent to burnout slug ruptures have been collected from experiments in the Tocco induction heater and from observation of recent pile failures of unbonded "J" slugs and from observation of film patterns and pitted areas on unruptured "C" slugs.

Six four-inch aluminum-jacketed bonded slugs, cocked with respect to the flow stream (the most likely in-pile flow discontinuity), have been burned out in the Tocco unit. The data demonstrate that with a local water temperature of 60 C burnout can be produced at powers ranging from 40 to 45 KW/ft.

Recently, three ruptures of "J" material at DR showed evidence of burnout similar to that induced experimentally in the Tocco unit. The "burned" areas on the slugs were on rib marks (180° from the normally anticipated point of burnout) and in the center of the slugs (as opposed to a position of approximately one inch from the end of the slug as was experienced in the Tocco test). Further study will be required to determine the full significance of the similarities and discrepancies between the experimental and in-pile failures.

Reactivity Changes with an Insulated Slug

The reactivity losses expected with various degrees of slug insulation have been calculated in view of the interest in an insulated fuel element. For practical use, the reactivity loss associated with such an insulating layer can be considered as being directly proportional to the temperature differential across the insulation; for an element operating at 30 KW/ft, a loss of 55 inhours would result from an insulating layer having a temperature drop of 100 C.

FUEL EXAMINATION

Slug Warping

There are indications from recent incidents of charges sticking in process tubes and from visual observations of warp in individual slugs from these tubes that lead-dip canned slugs show a greater tendency towards warp than do triple-dip canned slugs. A program has been initiated to determine more accurately the degree of warp of lead-dip canned slugs from heat-treated rods and heat-treated slugs, and for comparison the degree of warp in triple-dip canned slugs which are yet in the piles. The work will be facilitated by use of the recently installed slug contour projector.

Metal Examination Facility

It has become necessary to design, fabricate, and install a bulkhead in the 105-C Building Basin to exclude water from the Metal Examination Facility. This is due to the failure of the seal around the gate provided for this purpose and the lack of timely opportunity under present production requirements to again drain the main storage basin for replacement of the seal. Decontamination and painting will proceed after draining the water.

Approval for the completion of the scope of this facility has been received. Design expenditures have been authorized to proceed with planned chemical jacket stripping and ultrasonic grain size measuring equipment.

TESTING METHODS

Eddy Current Instruments

The MIZ-1 (Al-Si penetration detection) and MIZ-2 (bare slug, cracks and inclusion detection) prototype instruments were operated intermittently during the month, with more than 900 fuel elements tested for Al-Si penetrations with MIZ-1, and more than 1200 bare slugs tested with MIZ-2. Improvements are currently being made in MIZ-1 to reduce instability which now necessitates frequent balancing of the instrument.

The production prototype MIZ-1 was received from the shop and is being checked in the laboratory. The MIZ-2 production prototype is 40 per cent completed in the electronic shop.

Ultrasonic Bond Test

Development and construction of the prototype ultrasonic bond test equipment for use on the production line was accelerated to meet the August 15 schedule date.

COATINGS AND CORROSION

Corrosion Studies

The equations to explain and predict corrosion of aluminum in pile water have been further simplified. One consideration often neglected in such studies is the air film formed on aluminum after the original surface preparation before exposure. This together with the metal lost by pickling to remove corrosion products gave a small constant weight loss. Neglect of these factors led to somewhat erroneous corrosion data curves. These corrections have now been taken into account and lead to excellent agreement for values of constants in the fundamental equations.

Corrosion studies of APM-257 sintered aluminum have shown that localized attack of these samples occurs when they are exposed to pile water at 60 C or 90 C. The attack consists of a ring of attack surrounding a small black particle. Analysis has shown that these small black particles usually are high in iron.

Cleaning Hot-Pressed Fuel Elements

Both vapor blasting and chemical etching are being studied to determine the optimum method for removing graphite from cans after hot pressing. Neither method removes the last trace of graphite. However, after treatment by either method, the cans are cleaned to such an extent that no localized corrosion by the imbedded graphite is expected.

Anodized Films

The sealed anodized films which have been formed on aluminum in sulfuric or oxalic acid baths and have been sealed at 170 C are still satisfactory after exposure to pile water at 90 C for 150 days. Some fuel elements with this hard protective film were charged into D pile for a production test. One tube was discharged after 23 days and will be examined.

Electroplating Studies

The electroplating studies are continuing with major emphasis on design for the pilot plant. A rack which will insure uniform plating of solid or hollow pieces is being developed. Other studies include work on replating reject slugs and studies of heat treatment. So far these studies indicate that heat treatment does not improve the corrosion resistance of a nickel-plated uranium slug. Heat treatment appears to be undesirable, because the brittle compound layer is formed.

Some uranium wafers have been electroplated with a dual plate of iron and copper. This dual plate may give the necessary bond strength desired and result in a lower reactivity loss. Uranium which had been plated with iron and brass was hot pressed. The bond was very good, the tensile strength averaging about 7000 psi. A method for depositing copper on iron-plated uranium by chemical decomposition has been developed.

Insulated Fuel Elements

Some insulated slugs have been prepared by a mechanical method. The glass has been wound or stretched over the slug; an aluminum can was sized over the slug and the assembly was hot-press canned at 575 C for ten minutes at a pressure of 12 tons per square inch. Other methods of producing insulated slugs are being studied, but so far no other method has produced a satisfactory finished piece.

Segmented Fuel Elements

Two segmented slugs were prepared by placing uranium wafers in a can and canning by a vacuum Al-Si technique. Studies are continuing to obtain a finished fuel element which has satisfactory geometry and corrosion protection.

INVENTIONS

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

GE McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

Howard Perry, General Electric Co., Seattle, Wash., visited Hanford on July 15-16 to discuss turbines.

A. F. Sperry, Panellit, Inc., Chicago, Ill., visited Hanford July 29 through 31st for consultation on pressure monitor maintenance and design.

J. S. Snyder visited Savannah River Plant, Aiken, S. C., on July 5 through 10th for engineering conference and inspection - reactor construction and operation.

L. G. Henke visited Solar Aircraft Co., San Diego, Calif, on July 6 through 9th to witness test of downcomer expansion joint.

H. E. Hylbak visited Northwest Lift-Slab Co., Spokane, Wash., on July 9th to gather design, construction and cost data for the possible use of this type construction at Hanford.

D. A. Conley visited General Electric Co., Idaho Falls, Idaho, on July 13-14 for conferences on draftsmen's and designer's job and salary analysis.

J. L. Boyd attended business conferences, General Electric Co., Schenectady, N.Y. on July 19-20, and attended the Management Conference, Association Island, N.Y. July 15-17.

H. G. Johnson and W. L. Pearl visited Oak Ridge National Laboratory, Oak Ridge, Tenn., Savannah River Plant, Aiken, S. C., Knolls Atomic Power Laboratory, Schenectady, N.Y., and the Argonne National Laboratory, Chicago, Ill., on July 19 through 29th to obtain information to be used in design of a new separations plant.

J. C. Wood visited Pacific Oerlikon Co., and the Precision Machine Works, Tacoma, Wash., on July 20-22 to expedite charging machine fabrication and answer vendor's questions on Material specifications.

M. H. Russ visited Handford Foundry, San Bernardino, Calif., on July 20-21st; also Byron Pump Co., at Vernon, Calif., and the National Supply Co., Torrence, Calif., regarding castings for pump casings.

C. A. Mansius visited The Grover Co., Detroit, Mich., July 26-28 to witness testing of the Pneumatic Test Facility.

C. R. Bergdahl attended the meeting of Bonneville Power Administration, Walla Walla, Wash., on July 27th to discuss power rates and requirements.

O. H. Pilkey visited the General Electric Co., Schenectady, N.Y. on July 27-28th for technical consultation and attended the Management Conference on Association Island, N.Y., on July 29 through 31st.

B. R. Elder visited Aluminum Co. of America, Vernon, Calif., on July 30th for consultation regarding fabrication of test hole nozzles.

DECLASSIFIED

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	June 30			July 31		
	Exempt	Non Exempt	Total	Exempt	Non Exempt	Total
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	62	14	76	63	12	75
Design Planning Unit	18	12	30	18	12	30
Design Engineering Sub-Section	82	11	93	83	11	94
Design Drafting Unit	8	92	100	8	89	97
Total Section Personnel	171	130	301	173	125	298
Technical Graduates (Rotational)	-	6	6	-	10	10
TOTAL	171	136	307	173	135	308

Accessions - 9
Separations - 8

GENERAL

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

	Engineering Man Months Expended	% of Total	Drafting Man Months Expended	% of Total
1952 Expansion Program	48.4*	29.5	22.2*	24.3
Reactor Plant Modification for Increased Production	27.6	16.9	21.7	23.7
Research and Development	62.3	38.0	13.3	14.6
Other	25.6	15.6	34.2	37.4
	163.9	100.0	91.4	100.0

* Equivalent man months expended include 1.1 months of engineering overtime and 0.6 months of drafting overtime.

The drafting production for the month was 241 new drawings, 25 charts and graphs, and 351 revisions. The drafting room average was 5.7 man days per drawing.

DESIGN DEVELOPMENT

Statistics:

The total number of engineering man months expended on research and development during

July was distributed as follows:

	Man Months Expended	% of Total
Metallurgical Design Development	7.4	11.9
Reactor Plant Design Development	23.5	37.7
Separations Plant Design Development	27.4	44.0
Chemical Processing and Reduction Design Development	3.0	4.8
234-5 Design Development	1.0	1.6
	62.3	100.0

Metallurgical Design Development

A study was conducted on the technical and economic factors involved in the development and adoption of high frequency induction welding techniques for the welding of reactor fuel elements. The welding requirements were determined and the alternatives of mechanized inert-arc welding, and manual or mechanized induction welding were compared. The conclusions drawn were that high frequency induction techniques are potentially equal to, or better than, the inert-arc on the basis of effectiveness, and that application of mechanized induction welding equipment to the fuel element welding operation would bring about yearly savings adequate to amortize the capital equipment cost in less than one year. Further investigation will be continued on this study.

Test operation of the prototype fuel element canning machine continued during the first half of the month with emphasis on observation of the maintenance of alignment during the assembly stroke. As a result of these observations, it was concluded that the variation in positioning of components due to accumulated clearances and tolerances is large enough to make necessary a means of "locking in" or guiding the arms during the assembly. Operation of the machine was therefore discontinued in mid-month and effort concentrated on design studies and fabrication of modified parts to accomplish this objective. A draft of a program of time, manpower, and cost for this development work, as well as proposed solutions to other problems, was prepared.

An economic study of mechanized versus manual canning was made to bring previous cost estimates up to date. Differences in the two estimates are brought about by recent improvements in manual canning techniques.

Reactor Plant Design Development

Economic studies are nearing completion on evaluating the effect of variations in reactor physics parameters for dual-purpose and single-purpose reactors. Specifically, these studies evaluate the effect on unit cost of reactor power level, specific power, and lattice space. The conclusions indicate that it is more economical to go to large lattice space and fuel elements for dual-purpose operation while the smaller lattice and fuel elements are preferable for power operation only. Reactors of high power level tend to be more economical than those of low power level.

Work was started on establishing a design basis for a 1600 MW dual-purpose reactor capable of producing 400,000 KW of electric power. This study [redacted] will be used

primarily to evaluate reactor plant economics for the Special Study Report and at the same time these studies will be used to confirm the technical and economic incentive for development of smaller size reactor plants.

A preliminary set of conditions was established for a 1,000 MW boiling graphite reactor and an estimate of cost was completed. The results of the preliminary study indicate that a graphite reactor can be built for approximately the same cost as a water-boiling reactor as proposed by the Schenectady Atomic Power Study Group. A revised concept of a 2000 MW pressure water reactor was studied to apply improved design to the originally proposed dual-purpose reactor. The study re-evaluated known engineering facts and preliminary cost figures were developed to give an up-to-date concept of the design characteristics and construction cost of this reactor.

Other development work included the study of low temperature heat source from existing reactors for commercial generation of electric power, the evaluation of the effect of burnout on the degree of in-pile boiling permitted for various reactor operating characteristics and geometries, and the study of the effect of instantaneous loss of steam to the 190 Buildings of reactors B, D, F, DR and H under present operating conditions.

Separations Plant Design Development

The Purex Plant capacity study was continued covering the capacity of the uranium concentrators. Detailed hydraulic calculations indicate the capacity may be less than 2.4 times the instantaneous plant design capacity while the Technical Section is testing a pilot size unit to determine the extent of overhead distillate contamination which might be beyond cribbable limits at higher production rates. With the possible exception of the extraction columns and plutonium concentration system which have not been evaluated, it is indicated that the uranium concentrators will be the only major canyon process equipment with an instantaneous capacity factor less than 2.5. Emphasis was placed on obtaining the Purex utility requirements to permit a study to be initiated to determine if the 200 East Area powerhouse and the water facilities will "bottleneck" Purex capacity.

A study was completed on the scope and installation of organic stripping before intercycle concentration in the TBP series process and a document is in the final draft stage. It is considered necessary to strip the organic before the second concentration step because it decomposes causing increase in the process waste loss and foaming in the calcination pots. In addition, under certain conditions an explosion could occur in the concentrator if the organic were present.

A study was conducted on the UO_3 Plant and recovery program. Originally, it was proposed to design a low-pressure fractionator to produce 60 percent nitric acid. During the study it was learned that acid of 35 to 40 percent could be used for TBP Plant feed while the Redox Plant could use as low as 45 percent strength acid. A method was developed whereby 50 to 55 percent strength nitric acid could be produced by operating a nitric acid absorber in combination with a gas cooler. A study of the cooler and absorber capacity indicates that, depending upon the moisture content and the NO_2 content, each unit is capable of absorbing the NO_2 associated with an instantaneous production rate of 15 tons of uranium per day. With proper control of the moisture, a combined instanteous capacity of 30 tons of uranium per day may be realized.

The development of a prototype in-line alpha monitor was continued during the month. The modified sample cup punch will be manufactured on-site so as not to change the fabrication order. Check prints were made on the control panels and an electronic shop is reviewing the fabrication work which they will be required to do.

Other separations plant design development work includes: initiation of scope design for two alternatives for increasing the ventilation in the Redox Plant; start of scope for an expanded unloading system for the UO_3 Plant; study of two methods for nitric acid recovery and ammonia removal from Redox dissolver, off-gasses; continuation of work on preliminary scope for the provision of a second centrifuge in the Redox Plant; design of a device to permit disengaging of the Redox Plant impact wrenches from the crane auxiliaries.

Chemical Processing and Reduction Design Development

Additional tests were made during the month on the Task III furnace valve to obtain a pressure seal between the furnace top plate and the valve without satisfactory results. These tests were conducted at a pressure of 1,000 psi and 1450°F. An order was placed for metallic "O" rings which will probably correct the difficulty of thermal expansion differences between the valve and furnace top plate which results a yield point to be reached in the screw threads or the gasket itself.

Engineering Standards and Materials Development

Cost to date for development of engineering standards for the current fiscal year is $8,430. This work is supported by the five design development programs.

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

a. Revisions are being prepared for HW-4798-S and HW-4799-S, Standard Concrete Specifications. The work was advanced 40% during the month to 90% complete.

b. The revision of HW-5301-S "Standard Specification for Austenitic Stainless Steel Type 304 and 304L" is 40% complete, an increase of 10% during the month.

c. Work on the preparation of HWS-5750-S, "Electrical Pole Line Hardware and Materials", was advanced to 50% complete, an increase of 20% during the month.

d. A new standard specification HW-5310-S, "Standard Specification for Identifying Metals in Stock", is being prepared and is 60% complete.

e. A new mechanical standard for "Cylinder Gas Piping Systems" was started and is 70% complete.

f. Development of a design guide for the "Welding of Miscellaneous Metals and Alloys is 65% complete, an advance of 5% during the month.

g. Tests of concrete anchors for guying poles are proceeding on schedule with the program approximately 45% complete.

DESIGN PROJECTS

Statistics:

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

		Man Months Expended	% of Total
CA-512-R	100-K Reactor	27.5*	27.0
CA-512-W	100-K Water Plant	2.0	2.0
CA-513	Purex Separations Facility	10.6*	10.4
CA-514	300 Area Expansion	7.9	7.8
CG-551	Expansion of Building 234-5 Facilities	0.4	0.4
CG-558	Reactor Plant Modification	27.6	27.2
CG-562	TBP Plant Modifications	1.7	1.7
CG-574	3X Program - Irradiation	0.2	0.2
CG-578	Effluent Water Monitoring Improvements, 100-B, D, F, DR & H	1.9	1.9
CG-585	Oxidizer Off-Gas Treatment, Redox	0.7	0.7
CG-587	TBP Waste Scavenging	2.9	2.8
CG-588	Ammonia Scrubbers, Redox	1.4	1.4
Other Major Design Orders		11.9	11.7
Minor Design Orders		4.9	4.8
		101.6	100.0

* Equivalent man months expended reflects 0.9 man months of 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 5% during the month to 20% complete. Ten drawings are in the checking stage and approximately nine drawings have been issued for comment. Difficulty is being experienced in obtaining an acceptable high pressure recirculation pump with the stringent leakage requirements. A canned-rotor pump may be used or the requirements may have to be revised.

CA-513 - Purex Separations Facility

Design of revisions to the condenser design for the Purex Tank Farm was continued during the month. Phase I entails the revision of existing contract drawings as required to eliminate the surface condenser from the contract. This phase was advanced 1% during the month to 100% complete. The second phase entails material requisitioning for the contact condenser installation and is 50% complete. Phase III entails the preparation of new construction drawings and specifications for the contact condenser installation. In accordance with the Manufacturing Department's request, provision is being made for a different method of sampling the cooling water and condensate to the 216-A-8 Crib. Design for this phase is approximately 90% complete, an advance of 70% during the month.

A revision request recommending the construction of a 500 foot extension to the Purex railroad tunnel for disposal of failed process equipment by means of expendable flat cars was submitted for approval. The size and weight of Purex equipment such as the uranium and waste concentrators, 17' x 13' x 30' and weighing 41 tons, essentially preclude the crating and burial of such failed process equipment in the manner presently used in the Redox Plant.

CA-514 - 300 Area Expansion

Design of the 300 Area Expansion Program was advanced 1% during the month to 93% complete. Design of the 313 Building structure and equipment is essentially complete with the remaining work consisting mainly of revisions to equipment layouts. Scoping of the ultrasonic bond test machine is 90% complete with a report out for approval. A design cost estimate of $5,900 and eight drawings was made.. Final design will start upon approval of the report. Design of the battery charging rack and modification of monorail system was completed.

Design proceeded with the conversion of the 3706 Building to first aid and office occupancy and detail design is 20% complete, an advance of 10% during the month.

CA-535 - Redox Capacity Increase, Phase II

Final design of Redox Capacity Increase, Phase II, is 98% complete, an increase of 1% during the month. One drawing for the 233-S Facility tie-in was ready for approval by the end of the month. The remaining design work consists of miscellaneous jumpers and piping details. Comments were issued on vendor drawings.

CG-549 - Activate Task I, Building 234-5

Design of the Activation of Task I, Building 234-5 is 100% complete. Fifteen revised drawings were approved during the month to complete the change involving the use of an air sparging system in the reactor vessel instead of an agitator. The number of drawings for this job totaled 123.

CA-539 - Redox 231-SX Tank Farm

Design of the Redox 241-SX Tank Farm is 100% complete, an advance of approximately 1% during the month.

CG-558 - Reactor Plant Modification for Increased Production

Overall design on Reactor Plant Modification for Increased Production is 26.5% complete while detail and scope design are 20% and 75% complete, respectively. These percentages reflect the addition of mechanical shop drawings and the change in scope for the 100-F and 100-H Areas from intermediate to maximum flows. Nine specifications and 174 drawings have been issued for comments while 6 specifications and 65 drawings have been issued for approval. The drawing schedule was revised to reflect the above changes.

The mechanical and electrical design of the 181-B and C Buildings is complete while structural modification drawings are out for comments. The design of the 181-D Building has its various components in the comment stage. Work on the 183-B Building was continued with all structural drawings having been issued for approval. The design was completed for the 100-B 48-inch Raw Water Line from 181-B to 182-B.

Design of the 190-B, DR, and D Buildings continued with the immediate emphasis on the B and DR Buildings. Work in the 105-B Building was concerned with the valve pit, the front face, the downcomer, the solids feed system, and various instrument panels. Similar design is being performed for the 105-C and D Buildings. Other design work includes the effluent systems, the 151-D electrical substation, and procurement.

CG-562 - Waste Metal Recovery Plant Modifications

A brief functional scope of the additional modifications and equipment necessary to permit series operations of the 221-U Building was issued during the month. The work to be accomplished includes intercycle stripping and miscellaneous modifications. The reasons for stripping were enumerated under Separations Plant Design Development while other minor modifications will be necessary to provide for the best practical arrangement for series operation, maximum capacity, and increased efficiency and operability during series operation.

CG-574 - Hanford 3-X Program - Irradiation

Design of the Hanford 3-X Program - Irradiation, is approximately 95% complete under the present scope. Drawings have been sent out for comments and are awaiting comments from the Manufacturing Department.

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 5% during the month to 19% complete. Nine drawings are approved, four drawings are issued for formal comment and three drawings are in the check print stage. Purchase requisitions for rotometers were issued and spectrometer bids were reviewed.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design of oxidizer off-gas treatment equipment is 90% complete, an advance of 13% during the month. Five drawings were completed for approval during the month making a total of 20 drawings completed out of the 23 required.

CG-587 - TBP Waste Scavenging

A directive was issued by the AEC authorizing $204,000 for design and construction of TBP Waste Scavenging Facilities. Only four of the eight cribs included in the project proposal were approved, with request that separate action be taken to obtain authorization for additional cribs when data regarding operation of the first four are available. Overall design is 85% complete, an advance of 40% during the month. Of the 15 required drawings, nine were approved in July and four are out for comment.

CG-588 - Ammonia Scrubbers, Redox

Design for the Redox Ammonia Scrubbers was advanced 35% during the month to 50% complete. One drawing was approved and nine were issued for comment during the month.

CG-597 and CG-599 - Hanford 4-X Program

Projects CG-597 and CG-599 were activated to provide required metal preparation, irradiation and separations facilities for the production of low g/t plutonium. A sum of $500,000 was authorized under Project CG-597 for metal preparation and separations work and $100,000 was authorized under Project CG-599 for irradiation requirements. In the separations

area, work centers in the reactivation of the "B" Bismuth Phosphate Plant and in studies directed toward increased UO_3 Plant capacity.

CG-598 - Purex Acid Fractionator

Project proposal CG-598 for the construction of the Purex, nitric acid, vacuum fractionator facility was approved by General Electric and forwarded to the AEC.

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

Design on the Redox Back-Cycle was advanced 2% during the month to 70% complete. One drawing was completed and approved during the month.

D.O. 100630 - Fuel Element Pilot Plant - Phase II (CA-546)

Preliminary design for scoping arrangements of an electroplating machine and supporting equipment was started. Other shop drawings were reviewed and returned with comments to the Project Section.

D.O. 100724 - Modifications to the 314 Building for Fuel Development (CG-563)

The electrical portion of the Modification to the 314 Building is 95% complete, an advance of 5% during the month.

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 50% complete. At the middle of the month, the Technical Section requested that the entire new mock-up be moved about twenty feet to make room for expansion of existing mock-up and to take advantage of additional space heretofor unavailable.

D.O. 100756 - Fuel Element Pilot Plant Hoods (CA-546)

Design of equipment exhaust hoods for the fuel element pilot plant was advanced 25% during the month to 85% complete. Four drawings were issued for comment and one drawing was approved during the month.

D.O. 100757 - "As-Built" Area Maps

Drafting is continuing on the revision of Hanford project maps to bring them up to date and is approximately 35% complete, an advance of 5% during the month. Work on six additional electrical drawings and 17 additional civil maps was started.

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 25% during the month to 50% complete. Several new items, including a caustic measuring tank, were added to the scope of the work so that the required number of drawings was increased from 22 to 37.

D.O. 100834 - Particle Problem - Animal Exposure Equipment (CG-572)

Design on the alterations to the 1705-F Building is 100% com[illegible] an advance of 20% during the month.

D.O. 100843 - Central Mask Washing Station

A project proposal for a central mask washing station was completed and submitted to the Financial Department for approval.

D.O. 100846 - General Improvements to Laboratory Area Buildings (CG-576)

Design of the general improvements to the Laboratory Area Buildings was advanced 1% during the month to 96% complete.

D.O. 100884 - Third Charging Machine

A project proposal for the installation of a third charging machine was prepared and submitted to the Manufacturing Department for approval.

D.O. 100889 - Records Storage Space

The scope and cost estimate was established for the use of the White Bluffs Ice House as records storage facility. A rough draft of a project proposal was prepared.

D.O. 100893 - Redox Viewing Room

Design was continued on a Redox viewing room for viewing canyon operations and is approximately 95% complete, an increase of 15% during the month. Approved drawings have been transmitted to the field.

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

Design is proceeding and final design was started on the renovation and addition to Building 3730 as a hot shop for experimental work on graphite.

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

Detail design was initiated on a gas moisture detection system for the 100 Areas and five drawings have been started.

D.O. 100962 - Monorail Loading, 325 Building

Design was started on the installation of a monorail in room 4-7B of the 325 Building. One drawing was issued for comments and purchase specifications were completed.

D.O. 100963 - Floor Loading Stress Survey, 325 Building

Work was started on the checking of the floor for proposed loadings in various rooms of the 325 Building and is 10% complete.

D.O. 101006 - Discharge-Area Chute Liners, 105-B, D, and F Buildings

Design was started on the preparation of one drawing and on a write-up to be used for scope and project proposal purposes for the revision of the Chute Liners in the 105-B, D, and F Buildings.

D.O. 101007 - Hanford 4-X Program, Project Proposal

Hanford 4-X Program objectives and general plant requirements were received from HOO, AEC. A preliminary project proposal requesting authorization of $800,000 for the initiation of design and procurement was prepared and transmitted to the AEC.

DESIGN SECTION WORK COMPLETED OR IN THE CLOSING STAGES DURING JULY

*D.O. 100600 - (CA-431-B) Instrument Design on Gas Analysis
*D.O. 100839 - H-4 Pot Jumper, 202-S Bldg.
D.O. 100887 - Redox Production Facilities (CA-187-D-III)
*D.O. 100888 - Mobile Environmental Monitoring Laboratory
*D.O. 100908 - Slug Dimensioner and Fracture Displacement Indicator
D.O. 100921 - Sludge Pump 100-F Area
*D.O. 100922 - Jumper, J-T 13 - JS-1, 202-S Bldg.
*D.O. 100925 - (CG-550) Reactivation of Facilities
*D.O. 100926 - CG-519 As-Builts
*D.O. 100947 - General Grounds Improvement - 300 Area
*D.O. 101005 - Check Jumper Drawings for Shutdown Installation

* Design Section Work completed during the month.

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.

A D Beaton
Manager, Design
ENGINEERING DEPARTMENT

DESIGN SEC ON WORK STATUS

ENGI RING 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 Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Bal FY 55	Total
Exp. Program	107.7	10.	14.5	22.3	103.2	14	14	13	11	10	8	33.2	103.2
CG-558	31.6	-	3.7	5.8	27.9	4	4	4	4	4	3	4.9	27.9
*Reactor R&D	220		18.0	27.7	202.0	17.5	17.5	17.5	18.5	18.5	18.5	94.0	202.0
*Sep. R&D	250		20.5	31.5	229.5	20	20	21	21	21	21	105.5	229.5
*Met. R&D	54		4.0	6.0	50.0	4	4	4.5	4.5	4.5	4.5	24.0	50.0
*234-5 R&D	19		2.0	3.1	17.0	2	2	1.5	1.5	1.5	1.5	7.0	17.0
*Weapons R&D	10		.5	.8	9.5	.5	.5	.5	.5	.5	.5	6.5	9.5
Other Projects & Design Orders (incl. 4-X)	36.0	29.7	1.8	2.8	63.9	3	3	3	4	5	6	39.9	63.9
Anticipated Fut. Work						-	-	-	-	-	2	10	12
TOTALS	728.3	39.7	65.0	100	703.0	65	65	65	65	65	65	325.0	715.0

*Revised R&D based on $1,046,000 authorized funds

DESIGN ENGINEERING SUB-SECTION

1952 Exp. Program	165.7	-	29.4	35.9	136.3	26	24	21	17	14	12	22.3	136.3
CG-558	246.6	-	21.6	26.3	225	21	23	23	24	23	22	89	225.0
CG-578 & 579	20.8	-	1.7	2.1	19.1	2	3	3	3	3	2	3.1	19.1
R&D Programs	134 *	-	10.5	12.8	123.5	10	10	11	11	11	11	59.5	123.5
Other Major Projects (incl. 4-X)	71.7	103	14.6	17.8	160.1	15	15	15	17	20	20	58.1	160.1
Minor Projs.& Des.Orders	60	-	4.2	5.1	55.8	5	5	4	5	6	6	24.8	55.8
Anticipated Fut. Work	-	-	-	-	-	1	-	3	3	3	7	142.2	159.2
TOTALS	698.8	103	82	100	719.8	80	80	80	80	80	80	399	879

*Revised R&D based on $1,046,000 authorized funds

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects FY 55	Anticipated Future FY 55	Totals
Arch. & Civil	135	25	160
Mechanical	205	29	234
Electrical	140	70	210
Instrument	170	25	195
Standards	70	10	80
TOTALS	720	159	879

FJ-13

[redacted]

HW-32624 DEL

MONTHLY NARRATIVE REPORT - JULY 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Following is a summary of personnel changes in Project Section during the month:

	June 30, 1954	July 31, 1954	Net Change
Employees on Payroll	428	424	-4
Tech. Grad. - Rotational	13	9	-4

The end-of-month status involved these changes:

	Project Section Personnel	Tech. Grad-Rotational
Payroll Additions	2	
Payroll Removals	8	
Transfers into Section	7	1
Transfers from Section	5	3 (rotated to other assignments)
Transfers within Section	5	

B. SCOPE OF ACTIVITIES

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

Project No.	Title	Scheduled Completion	Actual Completic
CG-496	Recuplex	63%	56%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	97
	Reactor & Bldg.	100	93.3
	KE - Water Plant	98	83
	Reactor & Bldg.	78	77
	General Facilities	94	87.2
CA-513	Purex Facility, Part "A"	66	57
	Part "D"	69	72
CA-514	300 Area Expansion	67	48
CG-535	Redox Capacity Increase, Phase II	68	70
CA-539	Redox 241-SX Tank Farm	99.7	99.7
CA-546	Fuel Element Pilot Plant	37	14
CG-573	Hanford 3X Program - 300 Area	99	96

[redacted]

C. CRAFT LABOR

The dispute between pipefitters and millwrights concerning installation of piping and HCR equipment at 105-K Reactors was settled by assignment of the work to pipefitters.

Boilermakers and millwrights walked off the Purex job on July 23, 1954, as a result of a jurisdictional dispute. The boilermakers returned to work on July 26, but the millwrights remained on strike.

About 700 pipefitters were terminated from the Purex project beginning on July 29, 1954, for failure to perform assigned work.

D. SAFETY AND SECURITY

There were nine regular meetings for discussion of safety, security, and health topics which were attended by about 290 G.E. personnel. Four regular Monday morning tool box meetings were conducted in the field for service contractor personnel, and one mass safety-security meeting was held for them. Special Hazards Disclosure and Orientation was given to 44 service contractor employees before assignment to SWP work. During 4500 man-days worked in radiation zones, four cases of skin contamination and one of clothing occurred. In recognition of the safety record, 1,000,000 man-hours without a major injury, established by Minor Construction forces, wallet cards were issued and a dinner meeting was held.

E. HIGHLIGHTS

Minor Projects Sub-Section

Work was done on 42 project items, three informal requests, and miscellaneous work orders representing total authorized funds of $39,963,858. The Sub-Section completed assigned work on four projects: CG-559, Process Tube Flow Facility - 189-D; CG-567, Alum-Activated Silica Facilities for 100-B, D, F, and H; CG-575, Extraction Facility; CG-581, Development Facility; and two engineering requests. Four project proposals were approved by General Electric Company. Six authorizations were granted by the AEC. The Sub-Section accepted initial assignment of work on two projects and four engineering requests. At the request of AEC, the Minor Construction Management Unit made preliminary plans to establish warehousing service and vehicle maintenance shops in White Bluffs, the effective date to be August 16, 1954. The contract with J. A. Jones Construction Company was modified to increase the maximum of personnel from 700 to 1000, and to extend the effective period, by one additional year, to June 1, 1956. Important projects now in progress include Recuplex Installation, Expansion of 300 Area Production Facilities, Fuel Element Pilot Plant, Hot Semiworks Conversion, Hanford 3X Program, Reactor Plant Modification, and Hanford 4X Program.

Project Auxiliaries Sub-Section

Inspection was completed on 392 orders; 125 new orders which will require inspection were received. At the end of the month there were 1012 current orders for items which require inspection. The first Purex concentrator was shipped via Panama Canal on July 27. Delivery of Recuplex vessels and valves was essentially

completed. Reproduction output was about 403,000 square feet. Estimating completed 28 estimates, of which twelve were for project proposals. Field Surveys continued to obtain field data for design on modification of 100 Areas, and to perform routine services.

Reactor Projects Sub-Section

The 2101-M Building was reactivated for machining of graphite required for two test reactors. Actual shop work is scheduled to begin August 2, 1954. Responsibility for storage of graphite was transferred to Purchasing and Stores Section. At 105-KW, the installation of front face nozzles was completed, and the final testing was started. Acceptance testing of KW Reactor progressed to about 7% complete. Repair of gas leaks revealed by the gas leak test was begun on July 19, and the leakage rate is now about 450 C.F.H. Aggregate for the top shield of 105-KE Reactor has been placed to the tops of girders and out to the side crates. The Ball 3X hoppers have been air-tested, and the rear face crossheaders have been installed. Electrical equipment was being given preliminary run-in. The defective motor bearings in No. 1 and No. 5 pump units at 181-KW were replaced, and the pumps were given an eight-hour test run. A new secondary pump casting, in two sections, was made in Oakland on July 23, and test results are expected during the first week of August 1954. Equipment in 165-KW Building was shut down to allow electricians to complete their work. Final inspection of the 151-KW Building was completed with minor exceptions. The 183-KW Filter Plant has been tested satisfactorily on automatic backwash. The 107-KW Retention Basins have been filled with water for leak tests.

Separations Projects Sub-Section

The last major placement of concrete in the 202-A Building structure was made July 28. Cell wall kickplates were completed in place on July 21, and kickplates are being installed in the Hot Pipe Trench. Welding of stainless steel piping in the Hot Pipe Trench was about 50% complete, and installation of carbon steel piping has started in the Pipe and Operating Gallery. Equipment installation included 14 vessels. All four elevators were completed except for testing, and the shielded cab of the main crane has been completed except for painting. Ductwork for the Canyon was 74% complete, and for the Service Area 85% complete. The inside electrical work for the Canyon and the Service Area was 60% complete, and all graphic panels and transducer racks have been mounted. In the Head End Control Room, fabrication of the graphic panel for the heating and ventilating has begun. Good progress was made on steel tanks for 203-A Storage, the 211-A Chemical Tank Farm, and the 241-A Tank Farm. In 283-E Filter Plant Addition the two filter beds have been completed and filled with filter media. Boilers at the 284-E Power Plant Addition are being completed rapidly. Insulation was begun on July 17, 1954. The design phase of alterations to 291-A Stack was essentially completed, and fabrication at the vendor's plant is being resumed. The 2901 Export Water Line, which has been repaired extensively, was successfully tested, and the excavation was about 60% backfilled.

[redacted]

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

July 31, 1954

for J. S. McMahon, Manager - Projects

[redacted]

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

CG-597 - Hanford 4X Program - 200 & 300 Areas

An interim authorization has been received for design work on the 200 and 300 Areas phase of the low g/t program.

CG-599 - Hanford 4X Program

An interim authorization has been received for design and procurement on the 100 Areas phase of the low g/t program.

ER A-763 - Mobile Laboratory

The Radiological Sciences Department has issued a work order for preparation of a project proposal, and work is scheduled to begin during August, 1954.

ER A-2751 - Removal of Task I and II R.G. Line

A work order has been received for preparation of a project proposal, and work is scheduled to begin in August, 1954. Preliminary discussions have been held with Manufacturing Department.

ER A-2753 - Remote Sampling - Hot Semiworks

A project scope has been written and approved, and a rough draft of the project proposal is being circulated for approval.

ER A-6022 - Replacement of 146-FR Raw Water Supply Line

A study has been requested to determine the need for replacement of the raw water supply to the 146-FR Building. A work order has been issued to G.E. Plant Forces to expose this line in several alternate locations so that its condition may be determined.

2. Final Reporting

CG-559 - Process Tube Flow Facility - 189-D

This project was completed on July 15, 1954 with exceptions that are being accomplished on work orders.

CG-567 - Alum-Activated Silica Facilities for 100-B, D, F, and H

This work was physically completed with the exceptions of installing plastic

pipe in the 183-D Building and installing a mechanical pump seal in the 183-H Building. The project is being closed out with exceptions.

CG-575 - Extraction Facility

A letter has been received from AEC stating that no further work was required on this project.

CG-581 - Development Facility

Since work on the Extraction Facility has been stopped by AEC, the associated Development Facility is no longer required.

ER A-2750 - Redox Stack Cleaning

After cleaning of the stack and stack breeching, this engineering request was completed by area clean-up and decontamination of equipment during the latter part of July, 1954.

ER A-6021 - Study of Future Graphite Fabrication Facilities

A study was made of the suitability of area machine shops to perform graphite machining on a small scale instead of continuing the work in the 2101-M Building. It is now planned to perform machining for the Physical Constants Test Reactor and other immediate machining work for Technical Section at the 2101-M Building, after which the small amount of predicted graphite machining is to be done in the shops at 300 Area.

3. Current Projects

CG-496 - Recuplex Installation - 234-5 Building

Design had been completed previously; construction progressed 8% to a total of 56%. Construction of the CAW and Silica Waste Storage Facilities was completed; however, the monitoring wells have not been installed. Delivery of the vessels was completed, and most of them have been installed. Installation of special valves was accelerated to correspond with delivery, which is about 75% complete. Installation of the glass columns was started in the S and E Hood. Instrument and process piping was continued in the duct level.

CA-512 - 100-K Reactor Facilities

100-KW and 100-KE Water Plants

Over-all design of water plants remained at 99.8%. Construction progress was as follows: KW progressed 2.4% to a total of 96.4%; KE progressed 4.6% to a total of 82.4%; general facilities progressed 1.7% to a total of 87.2%. Cumulative totals of concrete placed to date were: KW water area 79,953 cubic yards; KE water area 76,394 cubic yards; and general facilities 14,628 cubic yards.

For 181-KW River Pump House, bearings in motors No. 1 and 5 were replaced under supervision of a factory representative. The motors were tested for eight hours during which the lubricating oil was filtered. Pumps No. 1, 2, and 3 have been shut down to allow completion of electrical circuits. All six ball valves are operable.

At 165-KW Building, most equipment was shut down to allow completion of electrical and installation work. These installations were essentially completed.

In 190-KW Building, five primary pumps are complete with new bowls. A new bowl for secondary process pumps was cast in two sections at the vendor's plant on July 23, and information on the results is expected during early August, 1954. Secondary process water pumps Nos. 2, 3, 5, and 6 are installed. All four service water pumps are complete, and the two backwash pumps have been run in conjunction with preliminary operation of the automatic backwash system.

The automatic backwash system for 183-KW Filter Plant has been tested by preliminary operation, and controls are approaching final completion. Cars of chlorine, liquid alum, and dichromate have been received and unloaded. The major equipment and building structure were completed.

Final inspection of the 151-KW Building was completed with the exception of air switches in the substation yard which are being adjusted. The 107-KW Retention Basins have been filled with water for leak tests.

For the 100-KE process buildings, electrical work has been accelerated on switchgear and control wiring which is necessary for the dynamic flow test in 105-KW. Installation of equipment which is not necessary for KW operation has fallen behind schedule.

The concrete floor slabs for Building 1706-K were completed for the - 13' level and 0'-0" level. Structural steel was completed and painted. Wheeler bottoms were placed in filters No. 3 and No. 4. All pump bases were completed. One backwash pump has been set.

105-KW and 105-KE Reactor Facilities

The 2101-M Building was reactivated for machining of graphite required for two test reactors. It is estimated that three weeks will be necessary to prepare machinery and tools; actual shop work is scheduled to begin August 2, 1954. Responsibility for storage of graphite was transferred to Purchasing and Stores Section, with the understanding that no graphite will be released without approval of Engineering Department.

Construction progress on the reactors was as follows: KW progressed 6.2% to a total of 93.3%; KE progressed 5.3% to a total of 77%. Many small placements of concrete were made in the building and for supporting facilities. Replacement of the roofs on 105-KW was about 90% complete.

Acceptance testing of 105-KW Reactor progressed to about 7% complete. The pneumatic test of process tubes began on July 21, 1954. The gas leak test began on July 19, 1954, and repairs have reduced the leak rate to about 450 C.F.H. About 27,000 pounds of balls for the safety system have been inspected. Testing and preliminary run-ins were continued for electrical systems, compressors, and process motors. Instrumentation tests in 115 Building were about one-third complete, and considerable work has been done to correct defective installations.

The Ball 3X hoppers were completed over 105-KE Reactor, and heavy aggregate for the top shield has been placed up to the top of girders and out to side crates. Installation of outlet crossheaders was completed. Electrical motors, load centers, and process equipment are being tested. Lighting systems and communication systems were substantially complete and ready for testing.

Structural progress consisted of completing the concrete brick wall in the Ball 3X Room, installation of partitions, Amercoating, and setting of permanent doors and hardware. Instrumentation work has been reduced to permit greater progress in 105-KW. Installation of downcomers was completed, and all spare parts have been fabricated.

The Tube Shop has been cleared and is being cleaned for turnover to Stores Section in early August, 1954. The Crossheader Shop has been cleaned, and custody of the building has been transferred to 100-H Area Patrol.

CA-513 - Purex Facility - Part "A"

Design completion remained at 99.9%; construction progressed 8.7% to a total of 57.4%.

Design alterations of the 291-A Stack were completed to the stage that fabrication at the vendor's plant is being resumed.

The last major placement of concrete in the 202-A Building structure was made July 28, bringing the total cubic yards of concrete to 86,421. Cell wall kickplates were completed in place on July 21.

Welding of stainless steel piping in the Hot Pipe Trench was about 50% complete, with 1331 welds accepted to date. The stainless steel lines from the south wall of the building to the headers was about 94% complete. Installation of carbon steel piping was started in the Pipe and Operating Gallery.

Equipment installation included 14 vessels: TK-M2, R 1A, 303, 307, 308, 311, 312, 314, 318, 323, 324, U 3, R 6, and 51.

All four elevators were completed except for testing, and the shielded cab of the main crane has been completed except for painting.

Ductwork in the Canyon was 74% complete, and in the Service Area 85% complete. The Service Section supply system was 68% complete, and the exhaust system was 54% complete.

Inside electrical work for the Canyon and Service Area was 60% complete. All graphic panels and transducer racks have been mounted in the Head End Control Room.

In 203-A Storage, stainless steel walls were completed for Tanks P-2, P-3, P-4, and about half of P-1. At 211-A Chemical Tank Farm the first wall rings were completed on Tanks TK-11 and 12. Three concrete tank walls were completed at 241-A Tank Farm, and forms are being set for the tank domes. The two filter beds at 283-E Filter Plant Addition were completed and filled with filter media. Insulation of new boilers at the 284-E Power House Addition was begun on July 17, 1954.

The 2901 Export Water Line was tested, and four leaks were repaired. The excavation was about 60% backfilled.

Modification of the ten cask cars was completed, and they were turned over to Manufacturing Department.

CA-513-D - Hot Semiworks Conversion

Design had been completed previously; construction progressed 13% to a total of 72%. "A" Cell has been completed except for installation of Chempumps and air-operated valves. "B" Cell was about 85% complete, and "C" Cell was about 90% complete. The self-concentrator crib has been completed, and shop fabrication has been started on the self-concentrator.

CA-514 - 300 Area Expansion Program - Production Facilities

Design progressed 2% to a total of 99%; construction progressed 8% to an over-all total of 48%. The heating and ventilating system of 313 Building Addition was completed with the exceptions of air supply tie-ins and final adjusting. The furnace area crane and monorail systems have been installed. To date two canning lines have been wired.

One additional resistance furnace has been set in place. All furnaces for two lines are now in position and are being wired. Installation of service piping and centralized air piping has started.

A 300 Area water study has been completed and is being assembled for comment.

CG-535 - Redox Capacity Increase, Phase II

Design progressed .5% to a total of 96.5%; construction progressed 6% to a total of 70% which is on schedule. Procurement was 95% complete.

CA-539 - Additional Waste Storage for Redox

Design and lump sum construction had been completed previously. The Minor Construction portion of work progressed 1% to a total of 97%. The T.C. rail-

road spur has been removed and the test well location surveyed. Instrument installation was in progress. A punch list of incomplete items has been issued.

CA-546 - Fuel Element Pilot Plant

Design progressed 2% to a total of 94%; construction progressed 2% to a total of 14%. Construction progress consisted of placing equipment foundations, underground piping, and trenches. The contractor has submitted a majority of proposed equipment items for approval.

CG-558 - Reactor Plant Modifications for Increased Production

Prototypes of the special tools and handling equipment for removal of the horizontal rods have been made and satisfactorily tested. Equipment for the horizontal rod replacement is being fabricated in Minor Construction shops. Layout for the burial pits is in progress, and test pits are being dug to determine the extent of contamination in the vicinity of new effluent lines in 100-B Area. A study is being made of production process required for absorbing rings.

CG-573 - Hanford 3X Program - 300 Area

Design progressed 2% to completion; construction progressed 3% to a total of 96%.

Revision No. 2 to the project proposal is being routed for signatures. The total estimated project cost was $863,000, representing a reduction of $23,000 because of transfer of excess equipment to other projects.

A portion of the 313 Building, hot press canning area, was released to the Metal Preparation Section during the latter part of July, 1954. All work was complete in 303-J Building except for hanging doors.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design completion remained at 55% as compared to 86% scheduled. Construction progressed 2% to a total of 16%. Procurement was 28% complete.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design of both phases had been completed previously, and both lump sum construction and that to be performed by Minor Construction was completed. Revision No. 10 of the project proposal was approved by AEC on July 23, 1954. The Phase II work, including installation of a crib and associated piping, is now out for bid.

CA-431-C - Metal Examination Facility - 105-C

Design had been completed previously; construction completion was revised downward to 19% in order to include General Engineering Laboratory equipment. Work has been started by Minor Construction on temporary construction required for painting the basins. Cleaning of the basins was scheduled to begin in early August, 1954, after which an evaluation of the situation can be made.

CA-434 - New Bio-Assay Laboratory

Both design and lump sum construction had been completed previously. Since no additional bids were received for furnishing hot plates, specifications are being rewritten so that vendors may comply with them.

CA-441 - Solvent Building

Design had been completed previously; construction began and progressed to 10% complete. The contractor has placed footings for the building and has set the inside wall forms.

CA-516 - Gable-Butte Railroad

Design had been completed previously; construction progressed 42% to a total of 80%. The placing of ties and rails was essentially completed, and preparations were made for placement of ballast. The work is expected to be essentially completed by the middle of August, 1954, which is within the directive completion date.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Construction remained at 3% complete. Review of the revision No. 2 to the project proposal is expected to be completed during early August, 1954, after which the contractor can begin work. Modification of piping and equipment at the 100-D Area Power House was essentially completed.

CA-533 - Hanford Works Official Telephone Exchange

Construction was about 6% complete. The proposed floor plan has been approved. The existing frame building has been partially removed, and underground telephone lines have been encased in concrete.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

Design progressed 15% to completion, and this includes a complete review of the new type effluent disposal field. Minor revisions were made to the drawings and specifications.

CA-544 - Central Distribution Headquarters

The project proposal was 50% complete, and preliminary design was 15% complete. The Plant Auxiliary Operations Department has not made final decision regarding the use of a portion of the White Bluffs Ice House for records storage.

CA-548 - (ER A-1211) Reactivate Project Proposal for New VSR Test Tower

The project proposal was not approved by the AEC, and the project is to be reviewed by the Engineering Department.

CG-549 - Activate Task I, RMA Line - Building 234-5

Completion status remained at design 100%, construction 6%. Procurement of miscellaneous material needed for Minor Construction work has been nearly completed. Fabrication has commenced on part of the Conveyor Hood, and the utility platform is being constructed in the Minor Construction shops.

CG-551 - Expansion of 234-5 Building Facilities

Design had been completed previously; construction progressed 9% to a total of 40%. Satisfactory progress was made on installation of instruments and electrical wiring, pipefitting, and panel control boards. Minor Construction continued excavation and removal of concrete for installation of the Radiography Unit in Room 192.

CA-555 - Graphite Hot Shop and Storage Building

Detailed design began and progressed to 15% complete. The project proposal was transmitted to AEC on July 22, 1954.

CG-556 - X-Level Controlling and Recording Equipment

Design had been completed previously; construction progressed 11% to a total of 40%. Shop fabrication of electrical conduit for the inner rod room was completed during the latter part of July, 1954.

CG-562 - Waste Metal Recovery Plant Modifications

Design completion status remained at 100% complete; construction completion status was re-evaluated and revised downward to 74%. Work is to be resumed during the first part of August, 1954.

CG-563 - Modification to 314 Building and Installation of Electroplating Pilot Plant

Design had been completed previously; construction progressed 36% to a total of 72%. The cooling units are in operation. Other completed work consisted of stainless steel exhaust duct, trench for the conduit, setting of the pallet rack, and sealing of the roof. The penetration etch equipment is being installed.

CA-566 - Building for Prototype Physical Constants Test Reactor

Design had been completed previously. The bids are being evaluated before decision to proceed with any phase of construction.

CG-569 - Replacement of Catch Tanks 311-ER and 302-BR - 200-E and W

Design had been completed previously; construction progressed 25% to a total of 95%. Both tanks have been installed and are in operation. Work progressed on repairs to roadway and fencing.

CG-572 - Particle Problem Animal Exposure Equipment

Completion status remained at design 100%, construction 1%. All remaining construction funds have been released to Minor Construction. All engineered materials have been ordered.

CG-574 - Irradiation

Following request by AEC to re-direct the scope of the project, the work is being reviewed before submittal of a revised project proposal.

CG-576 - General Improvements to Laboratory Area - 300 Area

Design progressed 15% to a total of 90%; construction progressed 12% to a total of 60%. Section 14-A to 22-A of the 326 Building has been completed. The sump pump has been installed, and this section was turned over to Technical Section during late July, 1954. Other work consists of mechanical piping, ventilating ductwork, and installation of fume hoods and related ductwork.

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

An order for the turret motor and reducing gear units was placed during late July, 1954.

CG-579 - Effluent Water Monitoring Improvements 100-C Area

An order for the turret motor and reducing gear units was placed during late July, 1954.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design had been completed previously; construction progressed 3% to a total of 74%. Construction was delayed because of other work with higher priority.

CG-587 - TBP Waste Scavenging

All material, except electrical, is out for bid or on order. Some procurement is proceeding on an emergency basis. Four drawings have been approved and issued for construction, and four more drawings covering the most important part of the work are being approved. Minor Construction can start excavation as soon as these drawings are issued for construction.

CG-588 - Ammonia Scrubbers, Redox

The AEC authorized construction during the latter part of July, 1954; however, construction is being delayed until more of the design work has been accomplished.

CG-589 - Dejacketing and Ultrasonic Equipment - 105-C Building

Preliminary design was 50% complete, and detailed design was 1% complete. Preliminary

and detailed design funds totaling $23,000 were authorized during the first part of July, 1954.

CA-590 - (ER A-756) Fly Ash Collection Equipment, Building 384

Preliminary design was 15% complete. The AEC is withholding approval pending further investigation of the scope.

CG-592 - (IR-172) Laboratory Supply Space, 3706 Building

Preliminary design was completed, but the project proposal was not approved by the AEC Review Board.

CG-594 - (ER A-2748) 221-T Building Roof Repair

The project proposal has been approved by AEC.

CA-595 - (ER A-760) Car Pullers 183 Building Coal Yard - 100-B, D, F, and H Areas

The AEC has approved funds, and detailed design is to begin as soon as the Work Authority is received.

IR-162 - Fire Protection Buildings, 272-E and W

Design had been completed previously; construction progressed 97% to a total of 98%. Installation of the sprinkler system progressed very rapidly and is nearing completion.

IR-178 - 440-Volt Substation - 189-D Building

Detailed design was completed, and construction was 39% complete. Three transformers were placed on the pad. Notice was received that the pole top disconnect was shipped on July 23, 1954.

IR-181 - (ER A-757) Temperature Control Improvement - 108-F Building

With design completed, the necessary authorizations have been received to permit the start of procurement and construction.

* * * * * * * * * * *

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 was returned unapproved by AEC on July 29, 1954.

ER A-758 - Mechanical Maintenance Shop Centralization - 100 Areas

Preliminary design was completed. The revised project proposal is being routed for signatures.

ER A-761 - Decontamination Facilities, First Aid Station - 100-H and 200-W Areas

No work was performed during the month because of other higher priority work.

ER A-1212 - Diversion Outlet from Retention Basins, D and F Areas

No work was performed during the month because of higher priority work.

ER A-1213 - Metal Loading Facility, 105 Buildings

Since the project proposal is being accomplished by the Design Section, no work was performed by Project Section.

ER A-2749 - Sheltered Welding Manifolds - 200 Areas

The scope has been increased to include welding manifolds and shelters for 221-T Building. The revised project proposal is being prepared.

ER A-3106 - 300 Area General Improvement Program

With scope and preliminary design each 77% complete, the revised project proposal is being routed for signatures.

ER A-3107 - Hanford Works Laboratory Exceptions

Work Order No. EE-6024 was re-opened to permit repair of the refrigeration compressor unit.

ER A-3108 - Replacement of 313 Building Roof

With scope and preliminary design each about 70% complete, the Manufacturing Department is reviewing justification.

ER E-488 - Tocco Induction Heating Unit, 314 Building - 300 Area

The rough draft of the informal request was reviewed, and the request is now being prepared for approval signatures.

C. RELATED FUNCTIONS

A very large completion of orders marked the inspection work during the month. In spite of the apparent reduction of work load, the current orders involved a comparably greater amount of time. The Corrosion Testing Program decreased by about 20% to a total of 420 coupons evaluated during July, 1954. There has been a marked increase of operations orders requiring inspection.

The problem of process water pumps for 100-K Area now consists of castings for the secondary process pumps. The first bowl was cast in two sections on July 23, 1954, and the parts will be inspected about mid-August 1954.

The first Purex concentrator has been shipped via the Panama Canal. One concentrator and one fractionator were shipped later in the month. Part of the problem of faulty welding pipe was solved by purchasing seamless pipe, and 6000 feet of welded pipe has been returned to the vendor for re-working.

Several pulse generator units have been rejected because of excessive noise in the gearing. The final acceptance or rejection has been referred to the Purex Design Unit.

Delivery of Recuplex vessels and valves was essentially completed.

Following is a resume of inspection activities during the month:

Item	Number
Total orders on hand requiring inspection	1012
Cumulative number of orders assigned to inspectors	931
Number of orders assigned to inspectors this month	91
New orders received by Inspection during the month	125
Orders completed	392
Total requisitions for engineered equipment transmitted for Expansion Program	40
Total orders of engineered equipment placed for Expansion Program	119

At the end of July there had been grand totals of 3085 Expansion Program requisitions for engineered equipment transmitted, and 3056 placed.

Reproduction output was 402,984 square feet during the 24 regular working days, including 116 hours overtime. The largest order processed during the month was 4408 prints for 100-K Reactor.

Estimating completed 28 estimates during the month. The completed estimates comprised the following: project proposal - 12, fair cost - 4, and scope - 12.

Field Surveys continued to obtain field data for design on modification work in the 100 Areas, and to give routine assistance with surveying and testing.

D. CRAFT LABOR

The possibility that reactivation of the 2101-M Building would complicate settlement of the jurisdictional dispute between construction machinists and millwrights caused AEC to request a two-weeks delay in that reactivation. On July 20, 1954, a letter from AEC authorized General Electric to proceed with machining of graphite required for two test reactors.

The dispute between pipefitters and millwrights concerning installation of piping and horizontal control rod equipment at 105-K Reactors was settled by assignment of the work to pipefitters.

As a result of jurisdictional disputes, boilermakers and millwrights walked off the Purex job site on July 23, 1954. The boilermakers returned to work on July 26, but the millwrights remained on strike.

About 700 pipefitters were terminated from the Purex project beginning on July 29, 1954, for failure to perform assigned work. The issue centered on installation of pipe assemblies which had been fabricated in the vendor's shop.

Percentages of voluntary terminations from the two major contractors decreased slightly. Kaiser Engineers and associated contractors lost 6.8%; Blaw-Knox and associated contractors lost 8.2%. Voluntary terminations from J. A. Jones Construction Company increased slightly to 2.7%.

REPORT OF VISITORS

To Hanford

R. S. Yeandle, G.E. Electronics Department, Schenectady, New York, visited W. B. Webster and F. H. Ames, Separations Projects Sub-Section, to discuss color television requirements of the Purex project.

Official Trips to Other Installations during July, 1954

R. W. Copeland and H. H. Hubble visited Electric Boat Company, Groton, Connecticut, from July 11 to July 15, to witness tests and consult regarding inspection.

W. A. Graf visited E. F. Hauserman Company, Los Angeles, California, from July 8 to July 12 to approve drawings.

J. R. Kelly visited G.E. Company, Schenectady, New York, from July 22 to July 31 to attend management conference, Association Island, New York.

J. S. McMahon and J. C. Hamilton visited Blaw-Knox Company, Pittsburgh, Pennsylvania, from July 13 to July 14 to coordinate inspection, purchasing, and expediting activities.

K. E. Kolb visited Van Vetter, Incorporated, Seattle, Washington, on July 29 to inspect material for Project CG-549.

J. M. Heffner visited the following companies from July 27 to July 31 for the purposes indicated: duPont Company, Wilmington, Delaware, for personnel conference; G.E. Company, Schenectady, New York, for tour of plant; and Association Island, Pierrepont Manor, New York, to attend management conference.

R. J. Cavanaugh visited Fruit Packers Supply & Equipment Company, Yakima, Washington, on July 2 to inspect mock-up for Project CA-514.

E. S. Davis visited Udylite Corporation, Detroit, Michigan, from July 27 to July 30 to approve design drawings.

[redacted]

J. W. Brands visited the following companies from June 28 through July 2 to coordinate inspection activities: Panelit Corporation, Chicago, Illinois; Rempe Corporation, Chicago, Illinois; Carpenter Steel Company, Newark, New Jersey; Swepco, Newark, New Jersey; Steel & Alloy Tank, Newark, New Jersey; and Alloy Fabricators, Perth Amboy, New Jersey. For the same purpose, J. W. Brands visited Electric Boat, Groton, Connecticut, from July 8 to July 10.

J. W. Brands visited G.E. Company, Schenectady, New York, from July 5 to July 7 to attend management conference, Association Island, New York.

G. C. Gabler visited G.E. Company, Schenectady, New York, from July 7 to July 9 to attend management conference, Association Island, New York.

J. S. McMahon visited G.E. Company, Schenectady, New York, from July 14 to July 16 to attend management conference, Association Island, New York.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - JULY 1954

PERSONNEL PRACTICES SECTION

The number of applicants interviewed in July was 1,940 as compared with 2,002 for June. In addition, 139 new applicants applied by mail. Open, nonexempt, nontechnical requisitions increased from 260 at the beginning of the month to 329 at month end. One hundred and twenty-nine employees were added to the roll and 97 removed during the month. Separations rate decreased from 1.19% for fiscal month of June to .67% for fiscal month of July. These rates when converted to annual basis are 12.41% and 8.74%, respectively. During July 36 new requests for transfer to other type work were received by Employment, and 22 transfers were effected. Attendance recognition awards were distributed to 222 employees in July, including 56 who qualified for four-year awards.

Eight employees retired during the month and two employees died. Eighty-five visits were made to employees confined to Kadlec Hospital, and 37 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 97.8%, in the Insurance Plan 99.2%, and the Employee Savings and Stock Bonus Plan 49.4%. At month end there were 852 registered under Selective Service and 792 military reservists were on the roll. Since August 1, 1950, 348 employees have terminated to enter military service, of which 107 have returned, 19 have not claimed reemployment rights, leaving 222 still in military-leave status. There are still practically 130 young technical men who are subject to Selective Service.

A total of 109 new employees attended orientation meetings. Of this number, 97.2% have signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 95.4% in the Good Neighbor Fund.

In June and July six claims were forwarded to the Department of Labor and Industries covering alleged hearing loss sustained by employees in the Reactor Power Unit. Orders have been issued by the Department on five of the cases rejecting the claims. It is interesting to note that on four of the claims one of the reasons given for rejection was: "That claimant's condition is not an occupational disease as contemplated by Section 51.08.140 R.C.W. 6-7-51." The sixth claim remains undetermined.

The effectiveness of the orientation film "Here's Hanford" has been analyzed by the Applied Mathematics Unit, and results indicate that the film is doing a very effective job.

Fifty-eight adopted suggestions were approved for awards in July, resulting in cash awards totaling $945 with a total net savings of $6,975.05.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

The News Bureau issued 42 news releases during the month, and signed articles were submitted to six national technical and trade magazines. Work on HAPO scientific accomplishments also was begun this month on preparation of the story of HAPO's 1954 engineering accomplishments for publication in the January 1955 issue of the General Electric Review.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS (Continued)

The first of a series of eight or ten full-page illustrated articles based on the work of various General Electric Departments at Hanford appeared in the Columbia Basin News during the month. The articles are based on interviews and illustrated with photographs arranged for the newspaper at their request.

The "Photo Tour of Hanford" exhibit was set up at the picture fair of the Pasco Water Follies. Arrangements have been made for the same display to be included in the Atomic Frontier Days exhibit room. A GE float, featuring the "plastic man" and calling attention to the fact that this year marks the 10th Anniversary of the start of operation of the first Hanford reactor, will be entered in the Atomic Frontier Days parade.

Four HAPO-produced documentary training motion pictures were requested by Hanford Operations, AEC, for shipment to the Savannah River project. The films are to be reviewed by the Health Physics and Biology Branches at Savannah and Oak Ridge with the thought that they may wish to purchase additional prints for their own use.

Material for the production of four complete "Inside Hanford" radio programs were developed, recorded, and rough-edited this month.

A total of 289 assignments were completed by the Photography Unit during the month, and 10,174 prints were produced.

SALARY AND WAGE ADMINISTRATION

The normal administrative work of the Salary Administration group was somewhat delayed because of the large number of papers to be processed in connection with changes in organization. The delay was minimized by overtime work.

Adjustments were made in the distribution of positions involving professional work at HAPO to bring them into agreement with the Company salary plan.

The second draft of the Salary Administration Manual to accompany the new salary plan was completed.

Reimbursement Authorization No. 227, covering the establishment of a new classification entitled "Graphic Designer 3", was received from the A.E.C.

A request was received from the Aircraft Nuclear Propulsion Department for help in solving problems in connection with the classification and evaluation of design and drafting jobs at the Company's Idaho Falls project. A member of the Wage Rates Unit reviewed work performed by draftsmen and designers employed by the various contractors at Arco and Idaho Falls, and recommendations have been forwarded to the Cincinnati office of ANP.

UNION RELATIONS SECTION

Formal agreements with the Hanford Atomic Metal Trades Council were executed on July 19, which action concluded 1954 contract negotiations with the three

UNION RELATIONS SECTION (Continued)

principal collective bargaining units at HAPO. A determination regarding the status of the contract for the one remaining unit (Community Firemen) is anticipated in the near future.

Delays have resulted in the processing of the Council's request for arbitration of a dispute involving requests for transfer to jobs within the bargaining unit because of additional information that came to light during the preparation of a stipulation of facts to be presented to the arbitrator.

After a two week delay, notice was received from the Atomic Energy Commission on July 20 to proceed with the reactivation of the 2101 Building to accomplish the machining of certain "pieces" required in our research program.

EDUCATION AND TRAINING SECTION

Plans are now being made for the fall semester of the Graduate School of Nuclear Engineering, and 16 courses have now been established and instructors have been obtained for all courses. Course information and instructor qualification reports have been sent to the University of Washington and the State College of Washington for approval. The course announcement bulletin is now being prepared for distribution during August.

The following training programs were held during the month: Job Instruction Training, Supervisor's Accident Prevention Program, Exempt Orientation, Labor Management Relations, Principles and Methods of Supervision, HOBSO II, Conference Leading, and Effective Human Relations.

HEALTH AND SAFETY SECTION

The Public Administration Service study and recommendations on Kadlec Hospital have been received, and a preliminary study has been made. Briefly, they find hospital transfer to a community non-profit corporation feasible and say that the $275,000 deficit may be converted to a $103,000 profit essentially by:

(1) Reducing salaries of presently employed people by 26% to gain $225,000.
(2) Eliminating 12 employees--mostly administrative--to gain $54,000. We feel that at most two employees may be eliminated in that the report contained erroneous information as to the number of administrative employees.
(3) Sale of x-ray, laboratory, physiotherapy, to Industrial Medicine at a profit of 25% plus an additional $40,000. We question such bookkeeping gains.
(4) Additional anticipated revenue over the 1954 fiscal revenue due to increased hospital patient load $61,000. There is no reasonable way of guessing whether the load will increase or not.

We feel that the only actual gain which could be counted on would be that from salary reduction, and such drastic reductions would seem entirely unwarranted.

The report further agrees with us that 22 additional hospital beds are needed but recommends securing this space and space for industrial medicine, and a new

HEALTH AND SAFETY SECTION (Continued)

laundry and steam plant, by such changes in present efficient operation that their wisdom is questioned, and we propose that a hospital planning consultant be secured to suggest more acceptable planning.

There were no major injuries in Operations or Community, and there were 310 minor injuries during July, as compared to 284 in June.

COMMUNITY SECTION

A recent court award which requires the payment of overtime for Firemen working on the two-platoon system has caused a problem as to proper salary differential between Firemen and Lieutenants, Captains, and Assistant Chiefs in the Community Fire Unit. Since rates paid to Firemen are substantially higher than those paid in surrounding communities, steps are being taken to resolve this matter with the Union.

ORGANIZATION AND PERSONNEL

Effective July 1, 1954, the Employee and Public Relations Department was reorganized in conformance with the new organization structure and nomenclature.

Total on roll July 1, 1954	896
Accessions	53
Separations	53
Total on Roll July 31, 1954	896*

*Totals include 59 Rotational Trainees, 1 ANP Trainee, and 10 Summer Program Trainees.

Employee and Public Relations

PERSONNEL PRACTICES

Employment

	June, 1954	July, 1954
Applicants interviewed	2,002	1,940

688 of the applicants interviewed during July were individuals who applied for employment with the Company for the first time. In addition, 139 applications were received through the mail.

	June, 1954	July, 1954
Open Requisitions		
Exempt	—	—
Nonexempt	260	329

Of the 260 open, nonexempt, nontechnical requisitions at the beginning of the month, 135 were covered by interim commitments. Of the 329 open, nonexempt, nontechnical requisitions at month end, 195 were covered by interim commitments. During July, 74 new requisitions were received requesting the employment of 173 nonexempt, nontechnical employees.

	June, 1954.	July, 1954
Employees added to the rolls	212	129
Employees removed from the rolls	117	97
NET GAIN OR LOSS	+ 95	+ 32

Separation Rate:

Fiscal Month June, 1954		Fiscal Month July, 1954	
Male	Female	Male	Female
.65%	3.57%	.41%	1.84%

Over-all Separation Rate:

Fiscal Month June, 1954	Fiscal Month July, 1954
1.19%	.67%

During July, 9 employees left voluntarily to accept other employment, 7 left to enter military service, and 1 left to enter business for self.

Employee and Public Relations

PERSONNEL PRACTICES

Transfer Data

Accumulative total of requests for transfer received since 1-1-54	393
Number of requests for transfer received during July	36
Number interviewed in July, including promotional transfers	37
Transfers effected in July, including promotional transfers	22
Transfers effected since 1-1-54 including promotional transfers	318
Transfers effected in July for employees being laid off	3
Number of stenographers transferred out of steno pool in July	12
Transfer requests active at month end	286

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	4	103	—	107
Re-engaged	-	—	—	—
Reactivates	1	21	—	22
Transfers	-	—	—	—
TOTAL ADDITIONS	5	124	—	129

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	14	48	1	63
Removals from rolls (deactivates)	3	30	-	33
Transfers	1	—	-	1
TOTAL TERMINATIONS	18	78	1	97

GENERAL

	6-1954	7-1954
Photographs taken	374	208
Fingerprint impressions	258	165

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	6-1954	7-1954
General Electric cases	145	68
Facility cases	32	20
Total	177	88

Employee and Public Relations

PERSONNEL PRACTICES

A representative of the Employment Unit attended a meeting of the Tri-City Veteran's Advisory Committee, Thursday evening, July 29, 1954. The employment of veterans in this area, the possibilities of schooling and training, and the possibility of attracting industry to the Tri-City area, in order to afford additional employment for veterans and others, were the major problems discussed. Delegates invited and attending were from such organizations as the Veterans, Organized Labor, Civil Service, Pasco Chamber of Commerce, Construction Contractors, Union Representatives, and the State Employment Security Department. Future meetings will be scheduled from time to time in which we will participate.

Clerical - The Minnesota Clerical Test and the Wonderlic Personnel Test were used in 37 cases to aid in the selection of clerical applicants.

Instrument Trainees - Two instrument trainees were tested and both are being processed for further consideration.

Supervisory Selection - During the month, eleven supervisory candidates were tested, nine of which were from the Telephone Section.

Personnel Records and Investigation

INVESTIGATION STATISTICS	6-1954	7-1954
Cases received during the month	171	143
Cases closed	190	196
Cases found satisfactory for employment	182	117
Cases found unsatisfactory for employment	11	9
Special investigations conducted	10	10
Cases closed before investigation completed	31	21

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6689
One-year awards made in July for those qualifying in June	58
Total two-year awards to date since January 1, 1950	2351
Two-year awards made in July for those qualifying in June	56
Total three-year awards to date	1113
Three-year awards made in July for those qualifying in June	52
Total four-year awards to date	324
Four-year awards made in July for those qualifying in June	56

SERVICE RECOGNITION

Total Service Recognition Pins presented to date	4207
Five-year Service Recognition Pins presented during July to exempt personnel	4
Five-year Service Recognition Pins presented during July to non-exempt personnel	23

During July, 11 people whose continuity of service was broken while in an inactive status were so informed by letter.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	85
Salary checks delivered to employees at Kadlec Hospital	32
Salary checks delivered to employees at home	5

At month end, participation in the Benefit Plans was as follows as compared with last month's participation:

	June	July
Pension Plan	97.8%	97.8%
Insurance Plan	99.1%	99.2%
Savings and Stock Bonus Plan	49.1%	49.4%

Fourteen letters were written concerning deceased employees and their families during July, regarding payment of monies from the Company and answering questions.

Two employees died during the month, namely:

Manufacturing	7-6-54
Plant Auxiliary Operations	7-24-54

Since September 1, 1946, 151 life insurance claims have been paid totaling $956,013.

Eight employees retired during the month of July, namely:

John Farris	W-9108-616	Normal Retirement
Carlton G. Harris	W-6302-627	Normal Retirement
Bertha G. Johnson	W-9256-722	Normal Retirement
Charles I. McGuff	W-9048-410	Normal Retirement
Jessie C. Dopp	W-8326-410	Normal Retirement
John I. Israel	W-3564-637	Normal Retirement
Thomas L. Matney	M-13188-542	Optional Retirement
Alzena C. Dickey	W-3109-752	Optional Retirement

During July, 29 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date, 307 employees have retired at Hanford, of which 163 are continuing their residence in this vicinity.

A total of 109 new employees attended Orientation Programs given by members of this group during the month of July. Of this number, 97.2% have signed up to participate in the Pension Plan, 100% have signed up to participate in the Insurance Plan, and 95.4% have signed up to participate in the Good Neighbor Fund.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

During the month preparations have begun to conduct a concerted drive for membership in the Nucleonics Employees Good Neighbor Fund. Much of the groundwork for this drive has been laid. The present percentage of participation in the Good Neighbor Fund is 67%.

A statistical analysis of the Orientation film was made by the Plant Auxiliary Operations Department. The results of the analysis indicated that the film is doing an excellent job in conveying information to new employees about the General Electric Company and their plans and policies, the Hanford Atomic Products Operation, and the community. Only one phase of the film, that relating to the Absence Plan, appeared to need further emphasis, which is being given.

It is not possible to obtain the services of Radiologists directly through some of the hospitals in the area, although they are available in the community. This has posed somewhat of a problem for those of our employees hospitalized, particularly in Kennewick and Walla Walla, where it has been necessary for the Radiologist to bill for his services through a hospital. Heretofore, special arrangements were made with Metropolitan to remedy this situation insofar as it relates to Kadlec Hospital and at a time when our Radiologist and Pathologist entered private practice. Recently Metropolitan has adopted a general practice in their Claims Division whereby they are willing, under certain circumstances, as an exception, to recognize these expenses and thus make direct payment to such specialists rather than have their charges billed through a hospital. Stipulations are that the patient must first qualify in all other respects for hospital expense benefits, and the service rendered by other than hospital personnel must be what could be considered a normal practice. Furthermore, it must be stablished that the hospital was not in a position to furnish the service, and it was necessary for the patient to look to an outside agency for help. J. F. Duncan, Employee Benefits Procedures, has requested Metropolitan to work up an amendment to our contract covering the Kadlec Hospital arrangements which will be general enough to cover the same situation at other hospitals so that all of our people will be treated on the same basis.

During the month the 300th employee retired from General Electric Company at Hanford Atomic Products Operation. He left our rolls July 30. Appropriate publicity concerning this individual will appear in the GE News in the August 6 issue.

Notification from the East and local approvals have been obtained to deviate from the rule of one major appliance in a thirty-six month period for refrigerated room air conditioners. Employees can purchase up to four of these items in that period of time. Proper publicity is being given to this change in regulation, and the Organization and Policy Guide will also be changed at an early date.

Employee and Public Relations

PERSONNEL PRACTICES

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		792
Number of reservists classified in Category A	118	
Number of reservists classified in Category B	79	
Number of reservists classified in Category C	63	
Number of reservists classified in Category D	532	
Number who returned to active duty to date		141
Number who returned to active duty in July		3
Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	2	
Number of reservists classified in Category D	40	
Delays requested (including renewals)		114
Delays granted		106
Delays pending		0
Delays denied		5
Delay requests recalled		3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		852
Employees registered who are veterans		296
Employees registered who are non-veterans		556
Deferments requested to date (including renewals)		1343
Deferments granted		1057
Number of employees for which deferments have been requested		153
Number of employees classified in Category B	0	
Number of employees classified in Category C	1	
Number of employees classified in Category D	152	
Deferments denied and appealed at state levels		16
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		3
Deferments denied by local board and not appealed		0
Deferments denied by state board and not appealed		1
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		2
Deferments requested, later withdrawn		1
Deferments pending		73

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Service

Military terminations since 8-1-1950 are as follows:

Reservists recalled		117
Selective Service		226
Women employees enlisted		5
	TOTAL	348

Employees returned from military service:

Reservists		61
Selective Service		46
	TOTAL	107

Known number not claiming reemployment rights	19
Number of employees still in military-leave status	222

Workmen's Compensation, Liability Insurance and Suggestion Plan

Suggestion Plan	June	July	Total Since 7-15-47
Suggestions Received	169	125	14274
Acknowledgements to Suggesters	184	120	
Suggestions Pending Acknowledgement	12	17	
Suggestions Referred to Depts. for Investigation	376	207	
Suggestions Pending Referral to Departments	29	41	
Investigations Completed and Suggestions Closed	431	168	
Suggestions Adopted - No Award	4	2	
Adopted Suggestions Approved by Committee for Award	83	58	
Total Net Cash Savings	$ 7,404.09	$6,975.05	
Total Cash Awards	$ 1,105	$ 945	
Total Suggestions Assigned to Field for Investigation	674	695	
Total Number Suggestions Outstanding to Departments	655	679	

The highest award of $100 was paid to an employee in the Metal Preparations Section for his suggestion to purchase aluminum silicon in smaller ingots thereby eliminating the necessity of cutting the former large ingots. Savings in labor and material was realized through adoption of this suggestion.

An employee in the Separations Section received the second highest award of $85 for his suggestion regarding paper cylinders for covering cask car trunions. This suggestion resulted in labor and material savings.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 42 insurance companies and investigation agencies during the month of July, 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	June, 1954 Long Forms	June, 1954 Short Forms
	46	366

	July, 1954 Long Forms	July, 1954 Short Forms
	44	394

Total Since Sept., 1946 - 21,499

Claims reported to Travelers Insurance Co.	June, 1954	July, 1954
	14	* 10

Total Since Sept., 1946 - 871

*Of the claims reported to Travelers Insurance Company during the month of July three were bodily injury claims and seven were property damage claims.

Employee and Public Relations

PRIVACY ACT MATERIAL REMOVED

PERSONNEL PRACTICES

Workmen's Compensation - General

In June and July six claims were forwarded to the Department of Labor and Industries covering alleged hearing loss sustained by employees in the Reactor Power Unit. Orders have been issued by the Department on five of the cases rejecting the claims. It is interesting to note that on four of the claims one of the reasons given for rejection was, "That claimant's condition is not an occupational disease as contemplated by Section 51.08.140 R.C.W. 6-7-51." The sixth claim remains undetermined.

Liability Insurance

vs. General Electric Company and Phillip A. Fuqua,

On May 4, 1954 a Summons and Complaint was served upon the General Electric Company and Dr. P. A. Fuqua on behalf of the plaintiff The action was based on alleged negligence of the defendants in that they allegedly advised the plaintiff that physical examinations revealed no serious abnormal conditions whereas active pulmonary tuberculosis was present. The Complaint was subsequently amended abandoning the theory that the defendants were responsible to the plaintiff under

Employee and Public Relations

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During the month of June, the News Bureau issued 42 news releases. The breakdown by category, distribution and content was as follows:

Subject		Distribution	
Pay and Benefits	5	Local	34
Employment Services	13	Daily	1
Good Will	4	Tri-City HERALD	4
Technology & Research	4	Columbia Basin NEWS	1
Safety and Fire	4	Special	2
Real Estate	2		
Administration & Legal	2	Content	
Richland-Hanford Protection	2		
Education and Library	1	Information	4
Health, Medicine	1	Pictures	3
Organization Changes	2	Short releases	26
Richland	1	Long releases	9
Other Communities	1		
Total	42		

Of the 34 local releases listed above, five were also sent to the science engineering list, one was sent to the construction list, and one also was sent to the business list.

Gathering information for the Hanford portion of the January, 1955, issue of the General Electric REVIEW has begun. Significant unclassified scientific and engineering accomplishments made during the year will be included in the article we will submit.

Articles were submitted for publication during the month to the General Electric REVIEW, PACIFIC FACTORY, MILL AND FACTORY, METAL PROGRESS, NUCLEONICS, and INSTRUMENTS. In addition, an article is being written for INDUSTRIAL SPORTS AND RECREATION. Also, SCIENTIFIC AMERICAN was queried about an article, and they have indicated interest in it.

The first of a series of eight or ten full-page illustrated articles based on the work of various General Electric departments at Hanford appeared in the Columbia Basin NEWS during the month. The articles are based on interviews arranged in reply to the newspaper's request, and are illustrated with photographs of HAPO activities and personnel. Each story was returned by the reporter for clearance by the department concerned.

A meeting was held with editorial personnel of the Columbia Basin NEWS concerning the relationship between that paper and the Company. Some misunderstandings were cleared up and dissatisfactions of the paper were discussed thoroughly and generally resolved.

The "Photo Tour of Hanford," exhibit was set up at the picture fair of the Pasco Water Follies. Arrangements have been made for the same display to be included in the Atomic Frontier Days exhibit room.

Employee and Public Relations Department

Approval was obtained to enter a float in the Richland Atomic Frontier Days parade on August 7. The float will feature the "Plastic Man" and will draw attention to the 10th Anniversary of the start up of operation of the first reactor at Hanford.

At a meeting in Pasco between representatives of the Tri-City HERALD, administrators of the three local hospitals, the Executive Secretary of the Washington State Hospital Association, and a representative of Employee Communications and Public Relations, Kadlec Hospital's press policy was re-examined. It was agreed that Kadlec Hospital's press policy is agreeable to everyone concerned.

It was reemphasized during the month that R. F. Mackness is the proper person at Hanford to promise an exclusive story or a "break" on a story to a reporter. This arrangement has been agreed upon to eliminate the possiblity that more than one reporter might inadvertently be promised advantageous timing on the same story.

The following speeches were cleared this month:

Presentation or Submission Date	Subject and Organization or Publication	Author
8/4/54	"The Atomic Energy Act of 1954;" Richland Kiwanis Club, Richland	W. E. Johnson
8/4/54	"Customer Relations;" Pasco Rotary Club, Pasco	W. J. Byron
9/23-25/54	"Personnel Protection in Atomic Industry;" Industrial Health Conference, Houston, Texas	W. D. Norwood

Safety topic for August, "Part of Everybodys Job," was written, approved and sent to Printing for production.

Safety Program Activities meeting was attended and minutes were prepared.

Inserts were prepared announcing the winner of the Area Reduction Award Contest.

The Health Activities Committee meeting was attended in an advisory capacity.

The August health bulletin, "Check Up," was written, approved--by both Medical and Legal--and sent to Printing for production.

Page proofs of the employee handbook, "You and General Electric at Hanford," were corrected and returned to the vendor for final printing.

Page proofs of the HGU-GE Agreement booklet were corrected and returned to the vendor for final production.

Printer's copy was prepared for the revision to the HAMTC-GE Agreement booklet and sent to Stores, which will order the reprinting.

A recruiting advertisement for an Assistant Reference Librarian was prepared, at the request of Technical Recruiting, and sent to the "College and Research Libraries"

magazine, for insertion in one issue.

Operation 4 S booklets # 1, 2 and 4 were proofread: copy was submitted to the printer for # 3.

All copy has been written, all photographs taken and a rough layout prepared for the Community Operations Annual Report.

The July issue of "Your Manufacturing Month" was prepared for distribution to all Manufacturing exempt employees.

The second and third full-page messages in the "Your Company" series were published in GE NEWS issues during the month.

Three Management NEWS Bulletins were issued during the month. Subjects discussed were classified documents, and the new HAMTC-GE Agreement.

Twenty projection engagements were met during the month with showings to approximately 650 people.

Ten films were secured from off-site for plant showings.

Booklets distributed through employee information racks were: 400 copies of GE Annual Report, 200 copies of "Adventures In Electricity," 100 copies of "Adventures Inside the Atom," 100 copies of "The Passing Scenes" and 25 copies of "Atomic Power."

In addition to the weekly Sheldon-Clair posters, 100 copies each of three Elliott Service Company posters, 18 copies of a Credit Union poster; 100 copies of a GE TV Program poster; 100 copies of "retirement plan" posters and 75 copies of a Suggestion System poster were distributed throughout the plant.

A double-page GE NEWS photo feature was devoted to Financial Department activities. This was the fifth in a series. The final feature, which will cover the Employee and Public Relations Department, also was planned.

In order to increase awareness of opportunities for advancement at Hanford, it was decided to publicize all promotions from nonexempt to the exempt roll, exclusive of technical graduates. Heretofore, only promotions from non-exempt to foreman or other supervisory status have been published in the GE NEWS.

A report of economies achieved in the Employee and Public Relations Department during FY 1954 was developed at the request of the Financial Department, and extensive discussions on the report of economies were held with a representative of that department.

Organization changes effective as of July 1 were announced, including specific changes at the Section level, in the July 9 GE NEWS.

Constructive comments on the new Radiological Sciences booklet, "Radiation Protection for You," were given at the request of the Manager--Administration and

Employee and Public Relations

Communications Section, Radiological Sciences Department.

Information on the number of information meetings and round table meetings was requested from all Departments. From this information a report on employee meetings at Hanford during the first half of calendar year 1954 will be prepared.

Achievement of an injury-free work record sufficient to earn the Central Safety Council Award was announced in a GE NEWS lead story accompanied by pictures of all the gifts. The pictures were republished at the request of Purchasing.

Lead GE NEWS story advised employees that the plant is approaching the General Manager's Safety Award. The entire Safety Award Plan was reviewed, with emphasis on the new division of employees into production and community groups for award purposes.

To call attention of HAPO bus riders to the safety hazards and damage to equipment involved in placing trash in the bus collection boxes, a feature was published in the GE NEWS. Pictures were taken of actual trash put in collection boxes.

Suggestion Plan was given promotion in two different issues of the GE NEWS. Unique treatment was given in one issue to provide different approach to promotion.

Full page feature was devoted to publicizing steps being taken at HAPO through training to reduce costs. Pictures and accompanying copy traced students in course giving attention to specific jobs with results of their job analysis.

Outstanding safety construction record of over 1,000,000 man-hours worked without a major injury was reported in lead GE NEWS story.

Photo of the signing of the GE-HAMTC Agreement was published to inform employees that payment of current wage increase would start on a current basis for people represented by the HAMTC, and that retroactive payment would be made.

A recreation magazine requested more pictures and information on the recent GE NEWS story on banding geese on the project. Letter was turned over to the News Bureau for an answer.

Lead story in GE NEWS called attention to the impending move of the 1131 Area Bus Lot to the new transportation facility, and advised bus patrons to watch for an announcement of the move date and possible changes in bus schedules and routes.

Lead safety story in the GE NEWS was devoted to novel displays and ideas for monthly safety program of people in B shift, Operations.

Double page spread in GE NEWS was devoted to organization chart, with photos of all top management through those reporting to Department Managers.

Booklet art work prepared during July included: final art for "Operation 4S" booklet #3, copy paste up for Operation 4S booklets #2 and #4 and rough color dummy for a forthcoming Community Operations Annual Report booklet, which will consist

of 10 pages plus cover.

One thousand feet of Kodachrome film on the Purex Model was received from the Studio in Hollywood. This will be rough-edited and put into proper sequence. Model was incomplete and only showed 65% completion of the project. When the model is complete the balance of shooting will be done.

A very difficult and important phase of filming on the interior of the Purex Building was begun this month. This entailed shooting from the top of the inner walls of the building, 90 feet from ground level. Subject being filmed was lowered into a very deep pit-like enclosure which was difficult to light. Camera and lighting arrangements were very complex and time-consuming.

Representatives of the Engineering Division of HOO, AEC, reviewed a 1200 foot reel of 16mm motion picture workprint on the early stages of Purex Construction. Rough-editing of these sequences was done locally to reduce cost of final processing studio services. The AEC people have requested that an 800 foot finished film with narration be prepared as soon as possible from this footage and some other that is awaiting developing and processing by the film studio. They are pleased with the work done on this footage in addition to some special color work made on the Purex Scale Model.

The film, "Getting the Job Done," was reviewed by representatives of AEC Security, Non-Technical Review Board, and Project Section for the purposes of bringing the security classification up-to-date. It was the concensus that the film bear the classification "For Official Use Only," and its use be limited to audiences falling within this category. New security titles will be made up for the films produced at HAPO to date.

A speaker and film program to be presented to schools and organizations in addition to television uses of these films also was planned.

Four HAPO produced documentary-training motion pictures were turned over to the Operations Division of the AEC at Hanford for shipment to the Savannah River project. The films are to be reviewed by the Health Physics and Biology Branches at Savannah and Oak Ridge for the possibility they may wish to purchase additional prints for their own use. The Chief of Division at Hanford Operations Office is recommending the purchase of the films by these other installations in view of the excellent coverage given radiation zone subjects.

The previously produced trial television program, "An Atomic Style Show," was sent to Public Relations Services Division for review and possible TV release. This was a seven-minute film release, edited into a composite of previously produced HAPO films. It featured dress and styles of special equipment worn by HAPO employees whose functions require working in radiation zones.

A letter of proposal and a tentative script for a new sound slidefilm to be used for the purpose of familiarizing new employees with the broad, General Electric Employee Security Program, was submitted to Employee Benefits for approval. The color slidefilm, when approved, will be used to aid in the conducting of new employee orientatinn to uniformly describe the vast Employee Security Program and

help accomplish the "selling job" required by presenting the material in a warm, human manner.

Material for the production of four complete "Inside Hanford" radio programs was developed, recorded and rough-edited this month. These included a Hanford Rail Operation feature, a Hanford Bus Operation feature, a feature concerning the early days at Hanford to be titled "Vignettes of Old Hanford" and a feature on the Suggestion Plan. The final finish recording and assembly on these four programs will be accomplished by mid-August when the "rack-mounted" sound system will be available for delivery.

A conference was held with a staff assistant of the Manager, Metal Preparations Section, for the purpose of developing a series of "Inside Hanford" programs concerning the 300 Area. Material for five programs was discussed and briefly outlined.

The Richland Junior Chamber of Commerce was advised that sound equipment requested for Atomic Frontier Days Celebration will be made available to them.

A total of 289 assignments were completed by the Photography Unit during the month and 10,174 prints were produced, of which 5,406 were "A" and "B" employee identification photographs. A total of 4,768 prints were Area and news work.

A total of 1600 feet of 16mm motion picture film was exposed on Purex Construction (A.E.C.), and 2,300 feet of 16mm motion picture film on 100-K Construction Project,

The Photography Unit's Technical Photo Lab completed twelve reports of which ten to seventy-five copies of each were produced for the Technical Section. With the addition of our new contact printer and copy stand a marked improvement in report making has resulted. With this improvement of finished work an increase in the request for service is noted. Each request for the reproduction of a technical report was carefully inspected to see if it could not be done by normal printing methods. Each report accomplished and completed by the Photography Unit's Technical Photo Lab required such fine detail that it was necessary to produce or reproduce the reports by one step photographic methods.

<u>See attached Statistical Report for Photography Unit.</u>

PHOTOGRAPHY UNIT
MONTH JULY, 1954

	2" X 2"	2 X 4"	4 X 5"	5 X 7"	8 X 10"	"	11 X 14"	16 X 20"	20 X 20"	NEG.	35mm Color Slides	3¼ X 4 B&W Slides	3¼ Col Sl	3	16 mm B&W
EMPLOYEE & PUBLIC RELATIONS DEPT.															
COMMUNITY OPERATIONS															
Police			367		6					101					
Recreation		10		10	6					18					
Community Engineering					196	56				72					
PUBLIC RELATIONS															
News Bureau		138	6	26	396					46					
Public Information		21	12		37			2		49					
EMPLOYEE RELATIONS															
G.E. NEWS		64	84	12	126					144					
SPECIAL Programs				12	189		18			121					
Training					3					3					
Employment	860									172					
TECHNICAL PERSONNEL			15		55					9					
HEALTH & SAFETY															
Industrial Medicine											8	21			
Public Health				20								2			
ENGINEERING DEPT.															
DESIGN			28		65	113				129	53				
Process Engineering					6	30				8					
TECHNICAL															
Applied Research					32	209				35		10			
Fuel Technology				7		166	3	11		46					
Pile Technology			572		2	129			3	101					
Metallurgy						14				4		1			
Separations Tech.			45		10	5				20					
TECHNICAL INFORMATION					9	2				9					
PROJECT			34		35	16				22		2	8		
Minor Projects						51				17					
Drafting					2	14				2					

(Continued) Gb-7

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PHOTOGRAPHY UNIT MONTH OF JULY, 1954	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	X 11"	11" X 14"	16" X 20"	20" X 20"	N E G.	35mm Color Slides	3¼" X 4" B&W Slides	3¼ 4" Color Slides	16 mm B&W
MANUFACTURING DEPT.			6		8					11				
METAL PREPARATION				12		125				2				
Power & Maintenance					19	143				9		17		
SEPARATIONS		21		28	76	35				52	4			
PROCESS						6				2				
REACTOR			12		6	9				14				
RADIOLOGICAL SCIENCES DEPT.														
BIOLOGY														400 ft.
BIOPHYSICS			134			94				60				
PLANT AUX. OPERATIONS DEPT.														
SECURITY	2,071	2,440			66					40				
LANDLORD FUNCTIONS					2					1				
PURCHASING					12									
ELECTRICAL UTILITIES					8					10				
A.E.C. SECURITY	35									7				
A.E.C. SAFETY					142					24				
A.E.C. OPERATIONS						34				2				
TOTALS	2,966	2,964	1,315	127	1,514	1,251	21	13	3	1,362	65	53	8	400 ft.

	MAY	JUNE	JULY
TOTAL ASSIGNMENTS	296	279	289
TOTAL NEGATIVES	1,737	1,380	1,362
TOTAL PRINTS	9,541	13,289	10,174

Employee and Public Relations

UNION RELATIONS

Union Relations - Operations Personnel

By letter of July 15, 1954, the Hanford Atomic Metal Trades Council advised the Company that ratification of the Company's offer of wage and other contract improvements by members of the various Locals had been accomplished. Formal agreements were executed on July 19, which action concluded 1954 contract negotiations with the three principal collective bargaining units. The status of the contract with the one remaining unit (Community Firemen) is somewhat clouded at the present time as a result of the recent court decision concerning hours of work. A determination in this regard is anticipated in the near future. At the request of area management, information meetings are being scheduled as time will permit to discuss with supervision the substance and intent of the contract modifications.

We reported last month regarding a timetable that had been established to proceed with the Council's request for arbitration of a dispute involving the Company's refusal to recognize bargaining unit employees as being entitled to preferential consideration over non-bargaining unit employees when requests for transfer to jobs within the bargaining unit are involved. The delays have resulted because of additional information that came to light during the preparation of a stipulation of facts to be presented to the arbitrator. On the basis of these facts, we have expressed our reluctance to proceed with the matter on the present state of the record. The issues in the instant case appear to be so shrouded by technicalities that no well-defined case can be uncovered that will embody the principle that the Council is enunciating or if presented to the arbitrator can reasonably be expected to result in an award that will resolve the matter in dispute.

It is our understanding that, as a result of the recent strike involving operational employees at Oak Ridge and Puducah, the Secretary of Labor has scheduled meetings at Oak Ridge during the first week in August to discuss health, housing, and community problems with the Atomic Energy Commission. Our New York office has been in close touch with the Oak Ridge situation and has indicated that they will provide details of the situation at an early date.

Grievance Statistics:

A total of twenty (20) grievances were received and five (5) Step II grievance meetings were held during the month. A breakdown of the grievances received and processed follows:

	ALL DEPARTMENTS				
	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Received this month	19	1	0	20	0
Received this year	170	39	1	210	24

Employee and Public Relations

UNION RELATIONS

Grievance Statistics (Contd.):

ALL DEPARTMENTS

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Step I					
Pending June 30	3	1	0	4	1
Settled this month*	14	0	0	14	0
Settled this year	120	10	1	131	22
Pending July 31	0	0	0	0	0
Step II					
Pending June 30	8	1	0	9	0
Settled this month**	5	1	0	6	2
Settled this year	49	27	0	76	3
Pending July 31	14	1	0	15	0
Arbitration					
Pending June 30	2	0	0	2	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending July 31	3	0	0	3	

BY DEPARTMENTS

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Manufacturing						
Reactor - Unit	10	72	6	52	2	22
- Nonunit	0	5	0	4	0	0
Separations - Unit	4	34	5	25	0	9
- Nonunit	0	4	0	2	0	1
Metal Preparation - Unit	1	21	0	16	0	4
Plant Auxiliary Operations						
Transportation - Unit	3	12	2	7	0	5
Plant Protection - Unit	1	48	0	18	1	29
- Nonunit	0	1	0	1	0	0
Stores - Unit	1	2	0	2	0	1
Electrical Distribution - Unit	0	3	0	2	2	2
- Nonunit	0	1	0	0	1	1

*Grievances brought to Step II prior to May 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 May 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

Grievance Statistics (Contd.):

BY DEPARTMENTS (Contd.)

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Employee and Public Relations						
Community - Unit	0	11	1	6	0	2
Hospital - Unit	0	1	0	1	0	0
- Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	0	6	0	5	1	1
- Nonunit	0	4	0	3	0	0
Engineering - Nonunit	0	5	0	7	0	0
Financial - Nonunit	0	3	0	2	1	1

*Grievances brought to Step II prior to May 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 May 1, 1954, are, for the purpose of this report, considered settled at Step II.

BY SUBJECTS

	Manufacturing		Plant Aux. Operations		Emp. & Pub. Relations		Radiological Sciences		Engineering		Financi	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	Th Y
Unit												
Discrimination	0	0	0	1	0	1	0	0				
Jurisdiction	6	50	2	18	0	5	0	3				
Health-Safety-San.	0	7	0	2	0	2	0	0				
Hours of Work	0	6	1	24	0	0	0	0				
Overtime Rates	2	13	0	3	0	0	0	0				
Holidays	1	2	0	0	0	0	0	0				
Sick Leave	2	6	0	0	0	1	0	0				
Seniority	0	6	1	5	0	0	0	1				
Grievance Procedure	1	3	0	0	0	0	0	0				
Wage Rates	2	17	1	5	0	2	0	1				
Miscellaneous	1	18	0	6	0	1	0	1				
Nonunit												
Health-Safety-San.	0	0	0	0	0	0	0	0	0	1	0	0
Overtime Rates	0	4	0	1	0	0	0	2	0	0	0	0
Vacation	0	0	0	0	0	0	0	1	0	0	0	0
Seniority	0	1	0	0	0	0	0	0	0	0	0	0
Continuity 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	0	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

UNION RELATIONS

Construction Liaison

On Thursday, July 29, Blaw-Knox discharged their entire force of 900 Pipefitters as a result of their refusal to install a handful of pipe hangers that had been fabricated off-site. Three other issues of a jurisdictional nature were also involved in the dispute. Work was resumed on Monday, August 2, as a result of meetings over the week end in which the Fitters won all points of any consequence.

A recommendation that Cisco Construction Company's complaint against the Pasco-Kennewick Building Trades Council be dismissed was made by the National Labor Relations Board Examiner who conducted a hearing on the matter at Richland on June 8-11. The recommendation ruled that neither the Council nor the 17 unions had engaged in unfair labor practices and that the purpose of the May 5 walkout ordered by the Building Trades Council was to force the A.E.C. to remove Cisco's nonunion help from the job Cisco had contracted to perform. The Examiner also found that the Commission was not an employer or person within the meaning of the Taft-Hartley Act, hence no finding of unfair labor practices could be made in connection with the incidents involved in the action.

A two-week delay in the reactivation of the 2101 Building to accomplish the machining of certain "pieces" required in our research program was requested by the Commission because of the possible disturbing effect that GE's operation of the building might have on the settlement of a jurisdictional dispute between construction millwrights and machinists who formerly operated the building. By letter of July 20, we were given notice to proceed. The matter has been thoroughly discussed Hanford Atomic Metal Trades Council in an effort to avoid becoming involved in a dispute that is of strictly construction derivation.

Employee and Public Relations

SALARY AND WAGE ADMINISTRATION

1. Effective July 1, 1954, the Wage Rates Unit was transferred from the Union Relations Section and became part of the Salary and Wage Administration Section.

2. The normal administrative work of the Salary Administration group was somewhat delayed because of the large number of papers to be processed in connection with changes in organization. The delay was minimized by overtime work.

3. L.L. Ferguson, Consultant in the Salary Administration Services Department, visited HAPO during the week of July 12 for the purpose of reviewing HAPO plans for meeting the requirements of the Company salary plan.

4. Adjustments were made in the distribution of positions involving professional work at HAPO to bring them into agreement with the Company salary plan.

5. The second draft of the Salary Administration Manual to accompany the new salary plan was completed.

6. Reimbursement Authorization No. 227, covering the establishment of a new classification entitled "Graphic Designer 3", was received from the A.E.C.

7. A request was received from the Aircraft Nuclear Propulsion Department for help in solving problems in connection with the classification and evaluation of design and drafting jobs at the Company's Idaho Falls project. A member of the Wage Rates Unit reviewed work performed by draftsmen and designers employed by the various contractors at Arco and Idaho Falls, and recommendations have been forwarded to the Cincinnati office of ANP.

8. Following the signing of supplemental agreements by Company and union officials on July 19, 1954, the 3% general increase offered to bargaining unit employees last month was put into effect during July, retroactive to June 10, 1954.

Employee and Public Relations
Education and Training Section

TECHNICAL RECRUITING

This Section is continuing to handle on an interim basis recruitment activities primarily involving experienced engineers and PhD candidates. As soon as the new organization is established in the Personnel Practices Section, these activities will be transferred and whatever additional assistance is required will be continued by our Section.

As listed previously, the spring recruiting of new technical graduates resulted in 33 acceptances whereas the quota was 40. In a further effort to meet this quota with qualified personnel, letters were sent to 1952 graduates who were in our employ for short periods before entering Military Service and who are now scheduled to be released. Preliminary indications are that the majority of these men will return to school under their Military Service education bill, although answers from all of the men have not been received as yet.

Data on 4 new PhD candidates was referred to our office by Schenectady during the month making a total of 345 considered from this source during the 1953-54 season. There have now been 9 acceptances of PhD candidates with 7 offers outstanding. Every effort is being made to secure answers from these 7 within the next month. 8 candidates are still scheduled to visit Hanford within the next few weeks.

ROTATIONAL TRAINING PROGRAM

During July, 1 rotational trainee was placed off the program and indications are that these placements will be accelerated within the next few weeks, as young technical men are called into the Service and as occasional changes are completed. 2 graduates reported during July so that all of the new graduates hired this spring have now been added to the roll making a total of 59 men now on the Program.

There were 6 young technical men lost to the Military Service during July making a total of 22 lost to this source since September, 1953, when military losses began. The attitude of the men vulnerable to Selective Service continues to be one of awaiting the draft call rather than enlisting. There are still practically 130 young technical men who are subject to Selective Service.

All the junior students hired for the summer program have now received security clearance and have been placed in the departments as follows:

Radiological Sciences	2
Manufacturing	5
Engineering	3

A series of luncheons are being held at suitable intervals for these men with various members of management to better acquaint them with the organization.

Employee and Public Relations
Education and Training Section

EDUCATION - SCHOOL OF NUCLEAR ENGINEERING

Plans are now being made for the fall semester of the Graduate School of Nuclear Engineering and 16 courses have now been established and instructors have been obtained for all courses. Course information and instructor qualification reports have been sent to the University of Washington and the State College of Washington for approval. The course announcement bulletin is now being prepared for distribution during August. Means for attracting more students in engineering and metallurgy courses are being formulated.

COUNSELING, TRANSFERS AND LOSSES

During July 4 employees resigned and 6 entered Military Service. There were 2 transfers, both to Schenectady.

Employee and Public Relations
Education and Training

TRAINING

JOB INSTRUCTION TRAINING workshop was completed Friday, July 2, with 7 supervisors participating. The course was conducted during the week of June 28-July 2.

SUPERVISOR'S ACCIDENT PREVENTION program was held in 300 Area July 1, 6, 7, 8, 9, 12, 13, 15, and 16, with 84 supervisors in attendance. These four-hour meetings give supervisors an apportunity to discuss the problems of accident prevention and how they as supervisors can develop their employees' awareness of the desirability of performing their jobs safely.

EXEMPT ORIENTATION was presented Tuesday, July 6, with 8 new non-supervisory exempt personnel attending. The Manager of Employee and Public Relations was guest speaker at a luncheon for the group at the Desert Inn. This program covers Company organization, sources of information, salary plan, labor laws, and human relations in industry.

LABOR MANAGEMENT RELATIONS was held Wednesday, July 7, with 8 supervisors attending. This program is a clause-by-clause discussion of the HAMTC and other local agreements with the Company.

PRINCIPLES AND METHODS OF SUPERVISION was presented to Group #72 during the two weeks July 12-23, with 17 supervisors completing the course.

HOBSO II was presented Tuesday, July 13, with 10 supervisors participating. This discussion meeting covers the effects of war-time economy, government controls, and post-war economy.

CONFERENCE LEADING was conducted Tuesday, July 27, with 14 supervisors participating. This program is directed toward stimulating interest in learning the techniques of leading group discusaion.

EFFECTIVE HUMAN RELATIONS Groups #17, 18, 19 began their conferences Tuesday, July 20, Wednesday, July 21, and Wednesday, July 28, with an attendance of 30 supervisors. This 12-hour program of three conferences deals primarily with actual human relations case studies. These cases are presented through various films, records, and written background, allowing group discussion of these and other on-the-job cases of the supervisors attending.

A member of Training was guest speaker Thursday, July 1, for the Introductory Tech Grad Program of the Technical Personnel Section. His talk was on training activities at HAPO.

Employee and Public Relations
Education and Training

Two members of Training met with the Training Officer of Camp Hanford Thursday, July 22, for discussion of their speed reading course. It is anticipated that the program may be offered at HAPO at a later date.

Complete summaries of all current training programs were prepared during the week of July 26-30 for the Manager of Education and Training Section.

Training program attendance transcripts were prepared during the week of July 26 for all units, Separation Section, Manufacturing Department, to include attendance from January 1, 1954 to July 15. Total attendance of section was 186. Other unit requests for transcripts this month totalled 64.

There were 11 requests during the month for Business English reference sources.

Supervisor's Handbook Record -

Number issued during July - - - -	2
Number returned during July - - -	10
On Hand - - - - - - - - - - - - - -	186

Of the 186 on hand 69 are not usable because of missing pages. The remaining 117 are ready for issuance.

At the request of the Supervisor of Employee Services Section, General Electric West Lynn, Massachusetts, a Supervisor's Handbook was mailed for his use.

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
JULY 1954

General

Personnel Changes

Four additions and six deletions resulted in a reduction of two and a roll of 263.

Visits

Dr. Scudder and Dr. Norwood attended the General Electric Association Island Conference. Dr. Scudder also visited the Schenectady Plant, the Research Laboratory and KAPL, while Dr. Norwood discussed problems with Mr. L. Newman of the New York office.
Messrs. Jorgenson and Healy of the Department of Labor and Industries visited the Industrial Medical sub-section. Mr. Art Gorman, Sanitary Engineer, Division Biology and Medicine, U.S.A.E.C. visited regarding environmental installations.

Employee Relations

Employee attendance at 22 meetings was 174.

Industrial Medicine

A total of six claims alleging hearing loss arising out of occupational exposure to noise have been transmitted to the State Department of Labor and Industries. All six have been rejected by the supervisor of Industrial Insurance for the Department. Two more claims are in process.
Medical examinations decreased from 1265 to 953, while dispensary treatments changed little from 4365 to 4362.
The monthly health topic discussed medical examinations, their benefits and limitations.
Sickness absenteeism was 1.15% as compared with 1.39% for June, while total absenteeism was 1.81% as compared with 2.28% for June.

Safety and Fire Prevention

No major injuries occurred in Operations or Community and minor injuries continued low.

	Minor			Sub Major			Major		
	June	July	To Date	June	July	To Date	June	July	To Date
Plant	284	310	2117	2	2	15	0	0	3
Community	24	22	151	0	0	0	0	0	1
Plant and Community 1953			2661			15			8

Supervisory Safety Training is now in full swing and is being well received. The New York office has made available a similar program for all General Electric installations.

Kadlec Hospital

The P.A.S. consultant study was completed. Several days before the study was made available to us for review it was turned over to the local newspapers. This resulted in some very erroneous impressions being passed on by the newspapers, who referred to great savings being made by drastic reduction in

General (Continued)

Kadlec Hospital (Continued)

administrative costs with the recommended change at an early date before community incorporation, to an incorporated entity of interested citizens. The report is in process of detailed analysis and when errors and unrealistic premises are eliminated still boils down to the recommendation that the budget be balanced by a reduction of salaries of hospital employees by some 26% to save $225,000 annually. The large number of administrative employees to be saved reduces to at most two we feel, when such errors as counting five employees twice, etc. are eliminated.

As soon as our detailed analysis of the P.A.S. report is completed a reply to the Commission's request for our opinion will be submitted.

The average daily census increased from 60.3 to 70.1 as compared to 72.4 a year ago. The occupancy percentage for the mixed services was 64.3.

One hundred and two live births at Kadlec was a record month.

Public Health

Complaints because of mosquitoes were numerous. New problems have been created by McNary Dam and lack of the government plane formerly available to spray inaccessable areas of stagnant water left by the receding Columbia. Some assistance may be expected from the U.S. Army Engineers and for next year the possibility of contracting for some airplane spraying is being considered.

Costs-June

	May	June	June Budget
Industrial Medicine	$42,253	$43,635	$42,803
Public Health (Oper.)	10,801	10,551	12,221
Kadlec Hospital (Net)	25,159	27,688	29,518
Hospital Expense Credits	579	2,462	2,500
Safety & Fire Prevention	13,440	13,911	32,574
Sub-Total-Health & Safety (Oper.)	92,232	98,247	119,616
Construction Medical (Industrial and Public Health)	1,074	1,122	1,665
Total-Operations & Construction	$93,306	$99,369	$121,281

The net cost of operating the Health & Safety Section before charges were assessed to various departments was $99,369, about $6,000 more than May but some $22,000 under the budget. The underrun was largely due to unused funds for safety prizes. The low hospital census in June accounted for the drop in hospital revenue of nearly $9,000. This was partially offset by decreased costs of some $4,300.

HEALTH & SAFETY SECTION

JULY 1954

Industrial Medical Services

The total number of examinations decreased from 1265 to 953. Dispensary visits decreased slightly from 4365 to 4362. General Electric employees sustained no major injuries and two sub-major injuries. Contractor employees sustained no major or sub-major injuries. Nurses on the non-exempt roll numbered 26.

There was one information meeting for industrial physicians held during the month.

Three additional claims for hearing loss due to noise exposure were filed during the month making a total of eight claims filed to date. Six rejections by the Department of Labor had been received by the end of the month. They were based on the fact that there was no proof of a specific injury at a definite time and place in the course of employment. The fitting of ear plugs for workers in the 182 and 190 buildings was nearing completion by the end of the month. No locations in the 200 Areas have yet been established as requiring personnel hearing protection due to noise levels. Mr. Jorgenson and Mr. Healy were visitors from the Department of Labor during the month and the hearing claims problem was briefly discussed with them.

A contract with the University of California has been negotiated and awaits Commission approval. The contract is for specialized services directed at accident and absentee repeaters.

The Health Activities Committee met on July 22 and the topic on "Medical Examinations, Their Benefits and Limitations" was presented. Material on this subject was prepared for distribution throughout the plant. The sickness absenteeism was 1.15% as compared to 1.39% for June.

Dr. Scudder visited the Schenectady Plant, KAPL and the Research Laboratory during the month. Noise problems were discussed along with other mutual industrial medical problems. Dr. Martin passed the medical examinations for licensure to practice medicine and surgery in the State of Washington.

Net costs incurred during June amounted to $34,405, an increase of $1,926 from the previous month. Salaries increased nearly $2,500 as a result of there being two more employees on the roll and the fact that an additional 3% was added to the overriding percentage. Other fluctuations occurred but were, for the most part, offsetting changes.

Costs-Operations

	June	May	Increase (Decrease)
Salaries	$32,695	$30,200	$ 2,495
Continuity of Service	3,270	3,020	250
Laundry	220	276	(56)
Utilities, Transportation, Maintenance	6,053	4,916	1,137
Supplies and Other	2,427	5,301	(2,874)
Total Gross Costs	44,665	43,713	952
Less: Revenue	1,030	1,460	(430)
Expense Credits	9,230	9,774	(544)
Net Cost of Operation	$34,405	$32,479	$1,926

1215648

Industrial Medical Services (Continued)

Costs-Operation (Continued)

Fiscal year 1954 net expenses amounted to approximately $44,000, or $1,000 less than was anticipated at the time the budget was prepared. Gross costs exceeded the budget slightly but were offset by the greater than estimated charges to other departments for services rendered.

Industrial Medical Services (Continued)	June	July	Year to Date
Physical Examinations			
Operations			
Pre-employment	175	108	608
Rehire	53	19	192
Annual	115	108	1893
Interim	280	299	982
A.E.C.	47	27	222
Re-examination and recheck	282	190	1482
Termination	111	101	549
Sub-total	1063	852	5928
Contractors			
Annual	26	9	99
Pre-employment	91	32	458
Recheck	54	23	234
Termination and Transfer	31	37	155
Sub-total	202	101	946
Total Physical Examinations	1265	953	6874
Laboratory Examinations			
Clinical Laboratory			
Government	199	119	944
Pre-employment, Termination, Transfer	2658	1662	11092
Annual	708	593	10381
Recheck (Area)	1243	1293	4681
First Aid	1	0	64
Clinic	376	259	2672
Hospital	3675	4100	30434
Public Health	0	3	3
Total	8860	8029	60271
X-Ray			
Government	19	17	115
Pre-employment,Termination, Transfer	348	199	1515
Annual	451	445	3170
First Aid	81	67	615
Clinic	185	204	1427
Hospital	269	282	2109
Public Health	1	7	54
Total	1354	1221	9005
Electrocardiographs			
Industrial	76	64	510
Clinic	3	0	8
Hospital	28	31	237
Total	107	95	755

HEALTH & SAFETY SECTION

JULY 1954

Industrial Medical Services (Continued)	June	July	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	353	592	2672
Occupational Case Retreatments	1376	1238	9088
Non-occupational Treatments	2251	2117	17920
Sub-total	3980	3947	29680
Construction			
New Occupational Cases	76	85	478
Occupational Case Retreatments	248	273	1328
Non-occupational Treatments	61	57	360
Sub-total	385	415	2166
Facility Operators	0	0	149
Total First Aid Treatments	4365	4362	31995
Major Injuries			
General Electric	0	0	4
Contractors	0	0	0
Total	0	0	4
Sub-Major Injuries			
General Electric	2	2	17
Contractors	0	0	1
Total	2	2	18
Absenteeism Investigation			
Calls Made	1	2	31
Employee Personal Illness	1	2	23
No. absent due to illness in family	0	0	1
No. not at home when call was made	0	0	7

Kadlec Hospital

The average daily adult census increased from 60.3 to 70.1 as compared to 72.4 a year ago. This represents an occupancy percentage of 64.3 broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 63.3; Obstetrical Service 68.6.

The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	37	74
Obstetrical Service	9	21
Total Adult	48	93

The average daily newborn census increased from 11.8 to 13.4, as compared to 12.2 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.92
Obstetrical	3.74
Newborn	2.68

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of June was 2.69. When newborn infants are included, the ratio is 2.25.

The net expense for operation of Kadlec Hospital for June was $27,688 as compared to $25,159 for May. Summary is as follows:

Kadlec Hospital net expense $27,688
This represents an increase of approximately $2500 due primarily to a drop in patient census. While costs decreased about $4300 and expense credits increased approximately $1900, revenue dropped about $8700 causing the net increase in expense.

A new record was established during July for number of babies born in any one month. There were 102 live births which compares with our previous high of 95 which occurred in September, 1952.

Following is a summary of employee relations meetings held in the Health and Safety Section during July.

	Meetings	Attendance
Hospital	12	97
Industrial Medicine	2	10
Public Health	5	45
Safety & Fire Prevention	1	12
General	2	10
Total	22	174

Hospital Unit (Continued)	June	July	Year to Date
Kadlec Hospital			
Average Daily Adult Census	60.3	70.1	76.3
Medical	15.1	21.0	21.2
Surgical	20.0	25.1	30.7
Pediatrics	11.1	9.6	12.1
Mixed	46.2	55.7	64.0
Obstetrical	14.1	14.4	12.3
Average Daily Newborn Census	11.8	13.4	11.4
Maximum Daily Census:			
Mixed Services	59	74	99
Obstetrical	18	21	21
Total Adult Census	81	93	116
Minimum Daily Census:			
Mixed Services	28	37	28
Obstetrical Service	10	9	4
Total Adult Census	39	48	39
Admissions: Adults	513	524	3869
Discharges: Adults	504	523	3875
Medical	124	154	1018
Surgical	184	191	1621
Pediatrics	89	74	611
Mixed	397	419	3250
Obstetrical	107	104	625
Newborn	94	91	558
Patient Days: Adult	1810	2173	16174
Medical	452	652	4499
Surgical	600	777	6508
Pediatrics	334	298	2567
Mixed	1386	1727	13574
Obstetrical	424	446	2600
Newborn	354	416	2423
Average Length of Stay: Adults	3.6	4.2	4.2
Medical	3.6	4.2	4.4
Surgical	3.3	4.1	4.0
Pediatrics	3.8	4.0	4.2
Mixed	3.5	4.1	4.2
Obstetrical	4.0	4.3	4.2
Newborn	3.8	4.6	4.3
Occupancy Percentage: Adults	55.3	64.3	70.0
Medical	40.8	56.8	57.3
Surgical	62.5	78.4	95.9
Pediatrics	58.4	50.5	63.7
Mixed	52.5	63.3	72.7
Obstetrical	67.1	68.6	58.6
Newborn	45.3	51.5	43.8

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

Hospital Unit (Continued)	June	July	Year to Date
Kadlec Hospital (Continued)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	5.21	3.92	
Obstetrics	3.88	3.74	
Newborn	3.05	2.68	
Avg. No. Employees per Patient (excluding newborn)	2.69		
Operations: Major	62	68	549
Minor	70	72	616
E.E.N.T.	64	39	459
Dental	0	0	10
Births: Live	94	102	565
Still	0	2	6
Deaths	5	3	35
Hospital Net Death Rate	.16%	.16%	.36%
Net Autopsy Rate	60.0	33.3	45.7
Discharged against advice	3	2	11
One Day Cases	164	140	1073
Admission Sources:			
Richland	70.2	69.5	72.5
North Richland	11.9	11.6	12.5
Other	17.9	18.9	15.0
Admissions by Employment:			
General Electric	64.1	64.9	67.9
Government	2.9	2.9	3.1
Facility	7.0	7.6	5.5
Contractors	18.7	18.5	17.9
Schools	2.5	.4	1.3
Others	4.8	5.7	4.3
Hospital Outpatients-F.A.	465	654	3809
Recovery Bed Patients-F.A.	0	0	71
Physical Therapy Treatments			
Clinic	273	265	2232
Hospital	24	113	633
Industrial: Plant	192	152	1270
Total	489	530	4135
Pharmacy			
No. of Prescriptions Filled	2562	2993	38432
No. of Store Orders Filled	526	584	3672

Hospital Unit (Continued)	June	July	Year to Date
Kadlec Hospital (Continued)			
Patient Meals			
Regulars	3017	3408	25161
Children under 8	325	403	2933
Specials	882	1240	8064
Softs	553	630	5900
Tonsils	103	52	850
Liquids	99	171	1217
Surgical Liquids	104	178	699
Total	5083	6082	44824
Cafeteria Meals			
Noon	1686	1791	12802
Night	319	387	2248
Total	2005	2178	15050

HEALTH & SAFETY SECTION

JULY 1954

Public Health Unit

Communicable diseases reported again declined with chickenpox leading the list. Incidence of other diseases remained at about the same level. The number of home nursing visits accomplished increased slightly due to the return of some of the staff nurses from vacation.

Miss Catherine Vavra, University of Washington, Department of Public Health, and Miss Marjorie Eastabrooks, State of Washington Department of Public Instruction, attended a meeting held to review the work of the local school teachers. This terminated the local teachers course sponsored by the University of Washington Extension Service and the local Health Department.

Two new student nurses were temporarily added to the staff for field experience in public health nursing. Miss Julia Anderson, University of Washington, School of Nursing, Field Consultant, made a routine visit.

Mr. Art Gorman, sanitary engineer, from the Division of Biology and Medicine, of the United States Atomic Energy Commission, visited the department concerning environmental installations.

Miss Pearl Fink, clerk consultant from the State Department of Health, visited our department during the month also, in terms of health department records and files.

Social service again concentrated a large portion of time in the area to helping with family problems. Of the 262 interviews held, 182 were directly focused on improving parents' relationships with their children and on solving marital conflict. There were 74 direct conferences with adolescents and adults who were concerned about personality difficulties. In 6 instances, help was given in meeting problems caused by physical or mental illness.

Results of food handling inspections were satisfactory. A decrease in the prevalence of flies is being noted in restaurants and is largely due to proper handling of garbage and regular cleaning of garbage receptacles. Eight itinerant restaurant permits were issued during the month. Results of bakery inspections were satisfactory.

Bacteriological results of effluent from sewage disposal plant showed improvement over preceding months. Oder continues to be a problem at the plant. Chlorination of sewer lines which become septic before entering the plant was recommended by the district engineer of the State Health Department as a partial solution to the problem.

Water samples collected on a weekly basis from the swimming and wading pools have been negative for coliform bacteria.

Bacteriological results of pasteurized milk samples were satisfactory. One milk producer was approved for shipping of Grade A milk.

Public Health Unit (Continued)

Rodents were baited at Riverland railroad shop and a good kill was obtained. Housekeeping was found to be very poor and was the major factor for the prevalence of rodents.

Mosquito control operations consisted of larviciding and fogging. There was a large increase in the prevalence of flood water mosquitoes throughout the village. Area in the vicinity of the Yakima River south of town which was inaccessible to spraying proved to be the causative factor. A meeting was held with representatives of the corps of army engineers to outline future preventive measures. A total of 1200 gallons larvicine mixture was sprayed by the mosquito control crew. Residential areas were completely fogged three times with a 10% DDT and 5% Lethane in oil mixture. Results of fogging with this mixture has been satisfactory.

HEALTH & SAFETY SECTION

JULY 1954

Public Health (Continued)	June	July	Year to Date
Education			
Pamphlets distributed	12,016	11,008	88,189
News Releases	12	8	87
Staff Meetings	1	0	8
Classes	5	5	118
Attendance	84	5	3,043
Lectures & Talks	1	0	40
Attendance	35	0	1,980
Films Shown	5	6	87
Attendance	176	111	3,434
Community Conferences & Meetings	21	14	183
Radio Broadcasts	9	0	58
Immunizations			
Diphtheria	8	9	36
Diphtheria Booster	121	105	240
Diptussis Booster	0	2	2
Tetanus	8	9	37
Tetanus Booster	121	105	239
Pertussis	8	4	30
Pertussis Booster	121	104	238
Smallpox	101	53	178
Smallpox Revaccination	97	112	590
Tuberculin Test	3	0	12
Immune Globulin	27	33	754
Other	0	0	4
Social Service			
Cases carried over	97	101	649
Cases admitted	17	14	125
Cases closed	13	16	112
Remaining case load	101	99	662
Activities:			
Home Visits	3	7	52
Office Interviews	334	255	2,176
Conferences	45	38	340
Meetings	8	9	54
Sanitation			
Inspections made	127	141	936
Conferences held	6	27	121
Bacteriological Laboratory			
Treated Water Samples	238	214	1,371
Milk Samples (Inc.cream & ice cream)	32	38	275
Other bacteriological tests	557	538	4,138
Total	827	790	5,784

HEALTH & SAFETY SECTION

JULY 1954

Public Health (Continued)	June	July	Year to Date
Communicable Diseases			
Chickenpox	33	22	276
German Measles	3	3	37
Impetigo	0	0	3
Influenza (U.R.I.)	0	0	4
Infectious Mononucleosis	0	0	1
Infectious Hepatitis	4	4	12
Measles	21	8	1,367
Mumps	3	8	29
Pinkeye	0	0	6
Poliomyelitis	0	1	1
Ringworm	0	0	6
Roseola	0	1	6
Scabies	0	0	1
Scarlet Fever	6	2	62
Streptococcal Infections-Throat	0	0	3
Tuberculosis	0	0	1
Whooping Cough	13	3	60
Total	83	52	1,875
Total No. Nursing Field Visits	364	444	4,621
Total No. Nursing Office Visits	56	49	712

COMMUNITY SECTION

JULY 1954

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Community Administration	1	1	1	1
Maintenance & Renovation Unit	11	135	10	139
Police Unit	17	30	17	31
Commercial & Residential Property Unit	10	22	10	22
Fire Unit	66	0	65	0
Transfer Study	0	0	1	1
COMMUNITY OPERATIONS SUB-SECTION				
Administration	2	1	1	1
Electrical Unit	5	15	5	16
Engineering Unit	6	3	7	3
Recreation Unit	3	4	3	4
Water & Sewerage Utilities Unit	5	22	4	22
Library Unit	4	8	4	8
Public Works Unit	5	54	5	54
	135	295	133	302

	Exempt	Nonexempt
Additions	1	13
Removals	3	6

EXTERIOR PAINT REPORT

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	244	28	52	192
B	288	51	149	139
D	2	0	0	2
E	43	9	31	12
F	115	22	62	53
G	5	0	0	5
H	152	49	92	60
L	39	1	4	35
Tract	20	0	4	16
Total	908 (1440)	160	394	514

141 houses sprayed.

Est. M.H. B. F.	11,651	Actual M.H. B. F.	14,282
Est. M.H. This Mo.	7,924	Act. M.H. This Mo.	7,692
Total Est. M.H.	19,575	Total Act. M.H.	21,974

Total Season Estimate 47,732

PLUMBING SHOP

JOB DESCRIPTION	NO. COMPLETED
Replacements - Major Fixtures	
Electric Water Heaters	10
Plumbing Work Orders	25
Plumbing for floor tile replacement	4
Cleared major sewer stoppages caused by tree roots	43
Plumbing for sink top replacement	45
Steam Work Orders	12

Steam inspection once a week on Government owned dormitories, apartments and commercial buildings.

Excavated with backhoe machine sewer lines, water lines, and all leaking or broken underground piping so repairs could be made.

Overhauled steam lines and radiator valves and traps in the Dental Building.

Dug up and disconnected sewer and water from prefabs to be sold.

Replaced street steps 23

SERVICE ORDER CREW

The following is a status report on service orders:

A.	On hand at the beginning of the month	259
B.	Received during the month	1633
C.	Completed during the month	1707
D.	On hand at the end of the month	119

E. A total of 984.9 manhours were spent on work orders.

F. Backlog of service orders by craft:

Electrical	24
Plumbing	53
Carpentry	42
Total	119

RENOVATION AND LABOR CREW

JOB DESCRIPTION	NO. COMPLETED
Houses renovated	36
Trash pickups	42
Minor carpentry repairs to housing units	43
Minor carpentry repairs to dormitories	9

Sprayed entire dormitories W-2, W-3, W-6, and W-7 for silver fish.

Dormitory rooms redecorated	0

All occupied dormitories serviced with linen and janitorial supplies weekly.

Eight (8) of the houses renovated were complete paint jobs.

MECHANICAL SHOP

A. Millwright Crew:

Service Orders	62
Routine Furnace Inspections	320
Service air conditioners in men's and women's dormitories	15
Service air conditioners in the Medical Building	4

B. Sheetmetal Crew:

Gutters & flashings - residential	10
Gutters & flashings - commercial	4
Coal hatch flashings	2
Smoke pipes replaced	3
Miscellaneous	10

C. Truck Drivers and Servicemen:

Tree removal orders	30
Top soil deliveries	18
Sidewalks removed	3
Sidewalks repaired	6
Driveways	2

CARPENTER AND LINOLEUM SHOP

JOB DESCRIPTION	NO. COMPLETED
Replace bath wall tile	7
Repair bath wall tile	2
Repair bath wall tile - dormitories	1
Replace bath floor linoleum	5
Replace kitchen floor linoleum	14
Repair kitchen floor linoleum	5
Replace steps and landing linoleum	2
Replace bedroom linoleum	1
Repair bedroom linoleum	2
Replace utility room linoleum	1
Replace dining room linoleum	1
Replace living room linoleum	1
Replace floor tile - Commercial Facilities	1
Replace sink top linoleum	50
Repair sink top linoleum	2
Replace work bench linoleum	7
Replace broken kitchen sinks	5
Replace sash balances	2
Raise slab	5
Repair porches	214
Jack & Shim	1
Repair exterior doors - Shop	9
Repair interior doors - Shop	2
Repair wall	2
Repair floor boards	2
Repair thresholds	10
Sidewalk forms	1
Ranch windows repaired	565
Chempoint - routine	11
Chempoint - work orders	48
Paint touch-ups	50
Interior carpentry repair - houses	2

COMMUNITY SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
JULY 1954

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	17	30
Transfers In	0	0
Transfers Out	0	0
New Hires	0	1
Terminations	0	0
Total - End of Month	17	31

GENERAL

The new traffic street striping and painting program was started Wednesday, July 28. The work is being done by an outside contractor.

Two new three phase traffic lights were installed this month at the intersections of Swift and Wright, and George Washington Way and McMurray.

This department assisted in traffic control during the Kiddie Krate Derby held on Saturday, July 3. We also provided an escort for the Kiddie Krate Parade held on Monday, July 5.

TRAFFIC

	1954 June	1954 July	1953 June	1953 July	1954 Total To Date	1953 Total Same Period
Reportable accidents	11	12	23	12	134	145
Property damage accidents	10	10	19	12	116	126
Injury accidents	1	2	4	0	18	18
Total persons injured	1	2	5	0	18	26
Fatal accidents	0	0	0	0	0	1
Accidents-Daylight hours	11	11	20	11	95	100
Darkness	0	1	3	1	39	45
Accidents-Business dist.	3	5	8	5	38	56
Residential "	7	6	9	7	77	69
Other "	1	1	6	0	19	20
Accidents investigated	9	8	16	4	80	91
Criminal complaints filed	9	6	13	4	58	74
Violations contributing to accidents:						
Negligent driving	2	1	2	0	24	19
Fail.to yield r.o.w.	7	8	9	3	41	51
Following too closely	1	2	4	4	25	25
Drunk driving	0	0	2	0	2	3
Pedestrian violation	0	0	0	0	3	3
Inattention to driving	0	0	0	0	0	1
Reckless driving	0	0	0	0	3	4
Speeding	0	0	1	0	1	3
Unsafe speed	0	0	2	1	20	8
Improper backing	1	0	1	0	7	10
Disregarding stop sign	0	0	0	0	0	4
Hit and run	0	0	0	0	0	1
Improper passing	0	1	0	1	1	3
Improper turn	0	0	2	1	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	1	0	1
Defective equipment	0	0	0	0	0	0
Bicycle violation	0	0	0	0	2	0
North Richland:						
Reportable accidents	6	5	13	7	53	62
Property damage accidents	6	4	11	5	44	50
Injury accidents	0	1	2	2	9	12

Richland	1954 June	1954 July	1954 Ave.Per Accident June	1954 Ave.Per Accident July	1953 Ave.Per Accident June	1953 Ave.Per Accident July
Accident property damage	$2092.00	$3882.00	$190.19	$323.50	$220.22	$204.17

TRAINING

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction was as follows:

38 Caliber Revolver ½ Hour
Total number of men reporting at the range 8
Number of men fired over the Army-L Course 6

Qualifications on the Army-L Course as follows:
Marksman 4 66% Expert 1 17%
Unqualified 1 17%

ACTIVITIES AND SERVICES	June		July	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	7	7	2	7
Bicycles impounded	4	1	7	1
Bicycle violations	0	0	0	0
Bicycles registered	127	0	33	0
Children lost or found	10	1	7	2
Complaints investigated (no enforcement action)	31	2	20	7
Deaths reported	0	0	1	0
Dog, cat, loose stock complaints	9	0	5	0
Dogs, cats, reported lost or found	6	4	11	2
Doors, windows found open in facilities	33	4	92	12
Emergency messages delivered	16	103	19	99
Fires investigated	10	2	12	1
Guns registered	4	0	9	0
Law enforcement agencies assisted	1	0	8	0
Letters of inquiry	112	0	93	0
Miscellaneous escorts	5	4	7	3
Persons injured by dogs	0	0	1	0
Plant departments assisted	21	2	15	3
Prisoners processed through Jail	21*	17	13	20
Private individuals assisted	18	4	30	3
Property lost or found	16	6	21	6
Records inquiries	95	0	93	0
Reports processed through Records	250	149	227	155
Street lights out reported to Electrical	107	22	93	21
Traffic safety meetings (July attendance - 215)	5	0	5	0
Total	908	328	824	342

*Three prisoners handled for W Patrol during June.

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MONTHL. .EPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
JULY 1954

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART I								
1. Criminal Homicide								
a. Murder & Non-Neg. Mans.								
b. Mans. by Negligence								
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break. & Entry	1	2	-	-	-	1	-	-
6. Larceny Over $50.00	1	4	-	-	-	-	-	-
Under $50.00	11	8	1	-	2**	1	1	1
7. Auto Theft	4	1	-	-	4**	1	-	-
TOTAL PART I CASES	17	15	1	-	6	3	1	1
PART II								
8. Other Assaults	2	2	-	-	-	-	2	1
9. Forgery & Counterfeit	-	-	-	-	-	-	3**	-
10. Embezzlement & Fraud	1	1	-	-	-	-	1	1
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons:Carry:Poss.	1	-	-	-	1	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	-	-	-	-	-	-	-	-
15. Offenses Ag.Fam.& Child	1	-	-	-	1	-	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	5	7	-	-	-	-	5	7
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	-	-	-	-	-	-	-	-
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intoxicated	2	4	-	-	-	-	2	4
23. Viol. Rd. & Dr. Laws:								
Fail. to Stop & Identify	2	1	-	-	-	-	-	-
Speeding	8	5	-	-	-	-	8	5
Stop Sign	6	8	-	-	-	-	6	8

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART II								
Reckless Driving	2	1	-	-	-	-	2	1
Right of Way	5	2	-	-	-	-	5	2
Negligent Driving	12	10	-	-	-	-	12	10
Defective Equipment	-	1	-	-	-	1	-	-
Illegal Passing	3	-	-	-	-	-	3	-
24. Parking	24	60	-	-	12	1	12	59
25. All Other Traff. Viol.	9	9	-	-	-	-	9	9
26. All Other Offenses:								
Malicious Mischief	2	-	-	-	2	-	-	-
Vandalism	7	3	-	-	-	-	-	-
Bike Violations	7	1	-	-	7	1	-	-
Public Nuisance	6	-	-	-	-	-	6	-
Investigation	1	1	-	-	1	1	-	-
Prowler	2	1	-	-	1	1	-	-
Disturbance	2	-	-	-	2	-	-	-
Pickup for Outside Ag.	1	-	-	-	-	-	1	-
Viol. of Dog Ord.	1	-	-	-	-	-	1	-
Damage to Property	3	-	-	-	1	-	-	-
Illegal Shooting	1	-	-	-	1	-	-	-
Dog Shooting	2	-	-	-	-	-	-	-
Indecent Exposure	-	-	-	-	-	-	1**	-
27. Suspicion	3	-	-	-	3	-	-	-
TOTAL PART II	121	117	-	-	32	5	79	107
PART III								
28. Missing Persons	1	2	-	-	1	2	-	-
Lost Persons	8	1	-	-	8	1	-	-
Lost Animals	9	1	-	-	2	-	-	-
Lost Property	25	3	-	-	25	-	-	-
29. Found Persons	-	-	-	-	-	-	-	-
Found Animals	9	-	-	-	-	-	-	-
Found Property	26	-	-	-	22	-	-	-
TOTAL PART III	78	7	-	-	58	3	-	-

OFFENSE	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART IV								
30. Fat.M.V.Tr. Acc.	-	-						
31. Pers.Inj.M.V.Tra.Acc.	2	1						
32. Prop.Dam.M.V.Acc.	10	4						
33. Other Traffic Acc.								
34. Public Accidents	No Accurate Statistics Kept							
35. Home Accidents								
36. Occupational Acc.								
37. Firearms Accidents								
38. Dog Bites	1	1						
39. Suicides	1	-						
40. Suicide Attempts	-	1						
41. Sud. Death & Bod. Found								
42. Sick Cared For								
43. Mental Cases								
TOTAL PART IV	14	7						
COMPOSITE TOTALS								
PART I,II,III,IV CASES	230	146	1	-	96	11	79	108

*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 Petit Larceny cleared for previous month. ** One Auto Theft cleared for previous year. ** Three Forgeries cleared for previous month. ** One Indecent Exposure cleared for previous month.

Property reported stolen	Richland	$3,859.52
Property reported stolen	No. Rich.	$1,401.50
Property recovered	Richland	$3,721.50
Property recovered	No. Rich.	$ 930.00

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore. & Calif. Six Months (July-Dec.)		One Month Average	1953 July - Dec.	1954 June	1954 July
Murder	.468	.078	1	-	-
Robbery	12.925	2.154	-	-	-
Agg. Assault	13.100	2.183	-	-	-
Burglary	80.750	13.458	19	2	1
Larceny	228.430	38.072	91	16	12
Auto Theft	40.380	6.730	6	-	4

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec.)		One Month Average	1953 July - Dec.	1954 June	1954 July
Murder	.378	.063	1	-	-
Robbery	7.900	1.317	-	-	-
Agg. Assault	2.280	.380	-	-	-
Burglary	69.550	11.590	19	2	1
Larceny	211.700	35.283	91	16	12
Auto Theft	38.950	6.491	6	-	4

Gsb-7

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953		Richland 1954	
	July	Dec.	June	July
Robbery	-		-	-
Burglary	22%		100%	-
Larceny	18%		19%	8%
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)		One Month Average	1953 July - Dec.	1954 June	1954 July
Murder	.187	.032	-	-	-
Robbery	5.170	.862	-	-	-
Agg. Assault	4.240	.707	-	-	-
Burglary	32.300	5.383	4	-	2
Larceny	91.370	15.228	60	16	12
Auto Theft	16.150	2.692	13	4	1

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec. 1953)		One Month Average	1953 July - Dec.	1954 June	1954 July
Murder	:227	.038	-	-	-
Robbery	3.160	.527	-	-	-
Agg. Assault	.910	.152	-	-	-
Burglary	27.820	4.637	4	-	2
Larceny	84.680	14.113	60	16	12
Auto Theft	15.580	2.597	13	4	1

Gab-8

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland 1953 July - Dec.	No. Richland 1954 June	July
Robbery	-	50%	-
Burglary	-	-	50%
Larceny	19%	6%	8%
Auto Theft	20%	25%	-

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 — JULY

OFFENSES	NO. CASES	JUVENILES	SEX	8	11	12	13	14	16	17
RICHLAND										
Larceny	1	1	F				1			
Illegal Shooting	1	2	M		2					
Prowler	1	1	M						1	
Mischief	1	2	M			1		1		
Illegal Entry	1	2	M	1		1				
TOTALS	5	8		1	2	2	1	1	1	
NORTH RICHLAND										
Larceny	1	2	M						1	1
TOTALS	1	2							1	1

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RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
JULY 1954

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR ISS.	SENT JAIL	SENT SUSP.	LIC. SUSP. OR REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
												$	$	$
DEFECTIVE EQUIPMENT	1	1											7.50	
DISREGARD BARRICADE	3	1	2							1		10.00	5.00	
DRUNK DRIVING	3	2		1			1		2				52.50	
F.T. DIM LIGHTS	1		1									10.00		
F.T. OBEY SIGNS	1		1									7.50		
F.T.Y.R.O.W.	4	1		3									15.00	
ILLEGAL PARKING	11		6	5								21.00		
ILLEGAL PASSING	3	1	1	1								10.00	7.50	7.50
INVALID DRIVERS LICENSE	10	4	3	3						2		20.00	25.00	
INVALID LICENSE PLATES	2	2											15.00	
NEGLIGENT DRIVING	16	10	3	3					1	2		275.00	217.50	45.00
NO REGISTRATION	2	2											12.50	
RECKLESS DRIVING	2	2							2	1			80.00	
SPEEDING	11	4	6	1						1		65.00	45.00	
STOP SIGN	11	3	8									65.00	25.00	10.00
THROWING BURNING MATERIAL FRM VEHICLE	1			1										
DOG ORDINANCE	1	1											2.50	
PETIT LARCENY	1	1											27.50	
PUBLIC INTOXICATION	8	4	4				1					54.50	40.00	12.50
PUBLIC NUISANCE	5	5											87.50	
SECOND DEGREE ASSAULT	4			4										
THIRD DEGREE ASSAULT	2			2										
VAGRANCY	1	1					1							
TOTAL	104	45	35	24			3		5	7		$538.00	$665.00	$75.00

ONE DRUNK DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

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RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
JULY 1954

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. SUSP. OR REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
DEFECTIVE EQUIPMENT	1		1									$ 10.00	$	$
DRUNK DRIVING	3	3							3				157.50	
DR. WHILE LIC. REV.	1			1										
F.T.S. & I.	1		1									25.00		
F.T.Y.R.O.W.	3	1	2									35.00	17.50	
ILLEGAL PARKING	61	1	36	24						1		126.00	3.50	3.50
ILL. USE 1 WAY STREET	1	1											5.00	
INVALID DRIVERS LICENSE	5	2	2	1								10.00	15.00	
INVALID LICENSE PLATES	3		2	1								22.50		
LEFT VEHICLE WITH MOTOR RUNNING	1			1										
NEGLIGENT DRIVING	8	4	2	2								75.00	100.00	
RECKLESS DRIVING	1	1											25.00	
SPEEDING	4		4									72.50		
STOP SIGN	8	2	4	2						1		20.00	12.50	
PETIT LARCENY	2	2					2							
PUBLIC INTOXICATION	8	3	5				1					62.50	25.00	
TOTAL	111	20	59	32			3		3	2		$458.50	$361.00	$3.50

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POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
JULY - 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	June	July	June	July	June	July	June	July
Richland	11	12	0	0	0	0	1	2
North Richland	6	5	0	0	0	0	0	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken		Other Causes	
	June	July	June	July	June	July	June	July
Richland	2	1	7	8	0	0	2	3
North Richland	2	1	0	3	0	0	4	1

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	June	July	June	July	June	July	June	July	June	July	June	July	June	July
Richland	0	0	0	0	3	12	0	0	0	0	0	0	3	12
No. Richland	0	0	0	0	2	1	0	0	2	1	0	0	4	2

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way		Neg. Drv.		Parking V.		Other V.		Totals	
	June	July	June	July	June	July	June	July	June	July	June	July	June	July	June	July	June	July
Richland	25	10	16	11	8	3	4	1	10	4	20	15	10	11	41	21	134	76
No. Rich.	8	4	7	7	5	3	2	1	3	3	11	8	51	60	22	13	109	99

THERE WAS NO TRAFFIC VOLUME COUNT FOR THE MONTH OF JULY

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT
COMMUNITY SECTION
July, 1954

PERSONNEL - COMMERCIAL & RESIDENTIAL PROPERTY UNIT:

	July
Beginning of Month	32
End of Month	32
Net Change	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
June	1,636	198	120	1	1,756	199
July	1,641	198	120	1	1,761	199
Net Change	+5	0	0	0	+5	0

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	51	7	1	0	52	7	59
Back Charges	1	0	0	0	1	0	1
FY Work Orders	610	214	18	0	628	214	842
FY Back Charges	28	1	4	0	32	1	33

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Lease:

Jimmy Walsh - a ground lease covering the operation and maintenance of the Richland Tire Exchange to be located at 737 Stevens Drive.

2. Supplemental Agreements:

a. Richland Shoe Salon - to provide for a new rent and make certain other changes required as a result of the lease renegotiation.

b. L. G. Cook - to provide for subleasing space to Richland Television Cable Corporation.

c. Carnation Company - to provide for construction of a prefabricated building, adjusted rentals, and make certain other changes necessary to supersede the basic agreement in its entirety.

3. Business Development:

a. Invitations to Bid were forwarded to twenty prospective Lessees in connection with leasing the vacant plot of land on Wellsian Way in the Heavy Industrial Area.

b. Thirteen proposals were received from prospective Lessees in connection with developing the two sites located at the intersection of Goethals Drive and Williams Boulevard and these were opened and read July 7.

c. Three proposals were received from prospective Lessees in connection with developing the site located at the intersection of Stevens Drive and Knight Street and these were opened and read July 14.

d. Two proposals were received from prospective Lessees in connection with developing the vacant land site located on Gillespie Street in the Light Industrial Area and these were opened and read July 14.

e. No proposals were received in answer to the Invitations to Bid in connection with developing the vacant land site located south of Linn Motors on Warehouse Road.

f. No proposals were received in answer to the Invitations to Bid in connection with developing the vacant land site located on Wellsian Way in the Heavy Industrial Area.

B. Noncommercial:

1. Lease:

Richland Lutheran Church of the National Lutheran Council - to provide for the occupancy of the government-owned Building 19-X for church purposes.

GENERAL:

A. Commercial:

1. The group formerly known as the Commercial Property Unit moved to the 1116 Building and consolidated offices with the group formerly known as the Housing & Maintenance Unit. In accordance with a re-organization, certain functions of these two former units have been combined under a new unit to be known as the Commercial & Residential Property Unit.

2. Yakima Federal Savings & Loan Association, opened a business office in the Cannon-Joseph Building #2, in the Uptown Business District.

3. Safeway Store, Inc. opened for business in their new location at 639 Cullum Avenue.

4. Moran & Hayden, terminated their sublease agreement covering the operation of an accounting service with Automatic Laundry Company.

5. Don Crawford and Dale Sylvester, d/b/a, Don & Dales Tune-Up, terminated their sublease agreement with John Gerdes and Petroleum Transportation Company.

6. Approval was granted Don Mc Lone to sell his building and assign the applicable Commercial Facility Lease to Orville W. Couden who proposes to operate a drive-in restaurant.

7. Ed & Martha Bishop operating Yellow Top Cab Company opened for business in the Automatic Laundry Company Building, 243 Symons.

8. Final Inspection was received on the E. H. Kidwell service station building at Duane & Lee.

B. Noncommercial:

1. The Bethel Church of the Nazarene requested an additional church site to be situated north of Symons Street.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland.

1. Drive-In Restaurant (southwest corner of Newcomer and George Washington Way)

2. Trailer lots on a plot situated between Richland and North Richland.

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION

July, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial:

	JUNE			JULY		
	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	38	9	47	38	9	47
b. Number of Sublessee Businesses	17	0	17	17	0	17
c. Total Businesses in Government-Owned Buildings	55	9	64	55	9	64
2. Doctors and Dentists in Private Practice	27	0	27	27	0	27
3. Number of Privately-Owned Buildings	67	7	74	67	7	74
a. Number of Prime Lessee Businesses	42	6	48	43	6	49
b. Number of Businesses operated by Sublessees	110	1	111	110	1	111
c. Total Businesses in Privately-Owned Buildings	152	7	159	153	7	160
4. Privately-Owned Buildings under Construction	4	2	6	3	2	5
5. Total Number of Businesses in Operation	207	16	223	208	16	224

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

B. Noncommercial:

	JUNE Richland	JUNE North Richland	JUNE Total	JULY Richland	JULY North Richland	JULY Total
1. Government-owned Building						
a. Churches	2			2		
b. Clubs and Organizations	5			5		
c. Government Agencies	2			2		
Total	9		Total	9		
2. Privately-owned Buildings						
a. Completed and in Use	10	1	11	10	1	11
b. Under Construction	6	2	8	6	2	8
Total	16	3	19	16	3	19
3. Church Plots and Buildings in Private Ownership	2		2	2		2
4. Pasture Land Permits			104			104

COMMERCIAL & RESIDENTIAL PROPERTY UNIT

RESIDENTIAL LEASES

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING July 31, 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	2225	254	10	386	834	1125	10	53	63	203	38	5201
Comm. Fac.	91	18		29	61	48		5	3	7	2	264
AEC	69	27		21	58	14		5	3	13	3	213
Other Gov't	7	2			3	1					1	14
Post Office	6				2	8				1	3	20
Schools	58			7	10	50			1	1		127
Comm. Activities	10			1	6	4					1	22
Med. Facilities	3	18			3	1				3		28
Chas. T. Main	3			2	5	6				2		18
Kaiser Eng.	6	7			8	1						22
J. A. Jones	2	2			2							6
Blaw-Knox	3	2		2	1							8
P. S. Lord	1				1							2
Steel Const. Co.	1											1
Vernita Orchards											5	5
Minor Const.					1			1				2
Commonwealth Inc.						1						1
Cisco Const. Co.		1										1
Not Certified						2					1	3
Turnover					1							1
House Ex.	2	1				1						4
Total	2487	332	10	448	996	1262	10	64	70	230	54	5963
Assigned Leases Written	1	1				2						4
Assigned Leases Not Written	2			2	3	12						19
Available For Assignment	10				1	3						14
Total	2500	333	10	450	1000	1279	10	64	70	230	54	6000

	Begin Month	Moved In	Moved Out	End of Month	Diff.
Conventional Type	2490	+33	-36	2487	-3
A&J Type	331	+4	-3	332	+1
"T" Type	10			10	
Precut Type	446	+4	-2	448	+2
Ranch Type	997	+5	-6	996	-1
Prefab Type	1273	+38	-49	1262	-11
Dorm Apts.	10	+1	-1	10	
A&J Apts.	64	+2	-2	64	
2BR Apts.	68	+2		70	+2
Fourth Housing	229	+2	-2	230	+1
Tracts	54			54	
Total	5972	+91	-100	5963	-9

COMMERCIAL & RESIDENTIAL PROPERTY UNIT

RESIDENTIAL LEASES

JULY 1954

DORMITORY REPORT

Dormitories:

	Beds Available	Vacant Beds	Occupied Beds
Men	477	30	447
Women	381*	78**	303
Total	858*	108**	750*

*This includes 2 beds used for Dorm Offices
**This includes 33 vacant beds in Dorm M 13

WAITING LISTS:

	Single Rooms	Double Rooms
Men	5	0
Women	4	0

The following Dormitories are in stand-by condition:

W 21	50 beds	W 15	50 beds
W 17	50 beds	M 7	39 beds
W 16	50 beds	Total beds	239

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	14
R.O.F.	1
Discharge	0
Transfers	7
Retirement	4
Move off project	23
Divorce	2
Death	1
Move to Wherry House	1
Misc.	1
Not eligible	3
Total	57

ALLOCATIONS

Houses allocated to new tenants	45
Exchanged houses	14
Moves(within the village)	37
Turnovers(divorce, death, schools)	4
Total leases signed	111
Total cancellations	112
Wherry house move to G. E. House	5
Houses assigned As Is	46
Houses sent to renovation	47
Applications pending	302

Removal of 65 Prefabricated Type Houses: Excess papers have been sent to the Stores Unit on the following number of prefabricated type houses:

	1BR	2BR	3BR	Total
March	4	0	0	4
April	14	6	2	22
May	16	2	0	18
June	8	2	0	10
July	4	3	1	8
Total	46	13	3	62

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COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

PROGRESS REPORT

	Orders incomplete as of June 31, 1954	Orders issued 6-30 to 7-31	Total orders Incomplete as of July 31, 1954
Service orders	472	1771	346
Work orders	787	360	674
Service charges		227	

Sewer stoppages due to tree roots 16

Principal work order loads	Incomplete as of June 30, 1954	Incomplete as of July 31, 1954
Laundry tub replacement	26	37
Bathroom renovations (tub, tile, lino.)	0	0
Tileboard bathroom	11	9
Kitchen floor linoleum	53	74
Kitchen cabinet linoleum	101	102
Shower stall	2	5

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132 alteration permits were issued, as compared to 82 issued in June.

Install air conditioner	21	Install automatic washer	23
Install automatic dryer	29	Install fence	13
Install additional outlets	2	Basement excavations	5
Convert to oil	3	Remove partition in basement	1
Remove part of kitchen cupboard	1	Remove bedroom shelves	1
Install back door	1	Install patio	5
Install air vent	1	Reverse range & refer	1
Install clothes poles	2	Remove broom closet	1
Install sink linoleum	1	Sand & refinish floors	5
Remove laundry trays	3	Change coal bin	1
Install dishwasher	4	Install greenhouse	2
Install cooling pads	2	Change water heater	1
Install driveway	1	Install fireplace	1
Install garbage disposal unit	1		

---

911 inspections were made, as compared to 655 made in June.

Alteration permits	219	Basement	1
Bathroom	7	Doors	15
Fill	10	Floorboards	17
Laundry trays	9	Linoleum	92
Lot lines	1	Porch & steps	22
Recall of range & refer	22	Shower stall	4
Shower rod	2	Screens	5
Sidewalks	28	Shakes	1
Sink	6	Toilet	1
Toilet seat	23	Trees	25
Walls	6	Windows	2
Yard	8	Miscellaneous	9
Dormitories	41	Renovations	125
Cancellations	120	Shows (new tenants)	84
Houses to be removed	6		

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

TENANT STORES

Merchandise Issued	Total Amount
Shades	461
Reflectors	9
Drip tray	11
Ice tray	30
Furniture delivered	27
Furniture recalled	42
Hydrator glass	8
Meat tender	8
Range parts	2
Grass seed	4
Cooker pot	1

RECALL AND DELIVERY OF RANGES AND REFRIGERATORS --MONTH OF JULY

	DELIVERY		RECALLED	
	REFERS	RANGES	REFERS	RANGES
1BR.	1TA	2SC		1SC
2BR.	3TA	2SC	1TA	
3BR.	1TA	1SC	1TA	1SC
A	2TA	2SC	3TA	9SC
B	3TA	4SC	5TA	8SC
E				1GE
H		1SC		1SC
L	1TA		1TA	
U	1GE		1GE	
V				2GE
Y			1GE	1GE
Total	12	12	13	24

Excess -- AB ranges--10 GE ranges -- 3 July 19, 1954

In Warehouse
GE 8' refers --- 2
GM 7' refers --- 2
TA 7' refers ---16
GM 6' refers --- 3
SO 82 refers --- 1
AB ranges ---14
GE ranges ---11
Frigidaire range 1

COMMUNITY SECTION
RICHLAND FIRE DEPARTMENT
JULY 1954

Organization and Personnel	Exempt	Non-Exempt
Employees - Beginning of Month	66	0
Transfers In	0	0
Transfers Out	0	0
Terminations	1	0
New Hires	0	0
End of Month	65	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$ 350.00	$ 5.00
(Estimated):	Personal	701.59	20.00
	July Total	$ 1,051.59	$ 25.00
	Year's Total	$10,279.23	$4,061.00

Response to Fire Alarms	24	20
Investigation of Minor Fires and Incidents	0	0
Ambulance Responses	34	0
Inside Schools or Drills	27	6
Outside Drills	33	11
Safety Meetings	8	4
Security Meetings	4	2
Fire Alarm Boxes Tested	217	116

During July 18,250-feet of 2 1/2-inch and 4,100-feet of 1 1/2-inch fire hose was given its annual pressure test.

On July 8, Captain Hatfield instructed 19 Design employees and on July 22, Fireman Ward instructed 20 Hospital employees. Chief Quane instructed 27 Electrical Engineers on artifical respiration.

Eight Cub Scouts and their leader toured the Central Fire Station on July 10.

The Fire Department provided standby service at the AEC Airport for plane landings on July 10 and 22nd.

Richland Fire Department

Fire Prevention

A total of 207 Richland and 26 North Richland fire inspections were conducted in July, resulting in 46 hazard reports being submitted. Two hundred and forty-three fire extinguishers were inspected and serviced, 8 were installed, 17 removed and 2 relocated.

Investigated fire at McGee's Delicatessen caused by defective wiring from inside neon sign.

Released two articles of publicity on hazards of grass fires to local newspapers and obtained publicity in Chamber of Commerce Weekly Bulletin relative to inspection and servicing electrical equipment to commercial establishments.

Fire Marshal attended several meetings with architects, contractors, AEC, and GE personnel regarding fire prevention and protection for new construction.

Started promotion of fire prevention week with Chamber of Commerce committee and arranged with local insurance firm to order 11,000 pieces of promotional material.

Received a breakdown rating of our 1953 Fire Prevention Program from the United States Chamber of Commerce. Except for our high fire loss rating, we enjoyed better than "Excellent" rating in all other fields.

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
JULY 1954

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees Beginning of Month	5	15
New Hires	0	1
Transfers Out	0	0
Terminations	0	0
Total End of Month	5	16

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	18
Anchors set and guys installed	8
Street lights repaired and steel mast arms installed	9
Street lights relamped - mercury vapor	2
Street lights relamped - 6000L and 4000L, 1100 Area	65
Street lights relamped - 6000L and 4000L, 700 Area	23
Flood lights relamped, 1100 Area	8
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	0
Primary line footage added	0
Primary line footage removed	0
Transformer KVA added	0
Transformer KVA removed	0
Net transformer KVA installed	0
New services installed - residential	0
New services installed - commercial	2
Television amplifier services installed	30
Temporary services installed and removed	2
Scheduled outages - primary	2
Scheduled outages - secondary	1
Unscheduled outages - primary	0
Unscheduled outages - secondary	0
Standby and Escort	0
High voltage tree trimming	21
Low voltage tree trimming	11

TRAFFIC SIGNALS

Relamping	8
Operational failures	1
Installations	1
Removals	0

RICHLAND ELECTRICAL UNIT

Routine maintenance checks	45
Routine check R.R. signal at Van Giesen	4
Total signals in operation - automatic	19
Total signals in operation - manual	3
Total signals in operation - flasher	1

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	32
Electrical motors checked and serviced - water	87
Electrical motors checked and serviced - sewage	18

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	4
Outside circuit checks	14
Inside faults repaired	1
Outside faults repaired	0
New circuits placed in operation	0
New boxes placed in operation	0
Boxes removed from operation	1

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	4
" " " " " " - BB1S2	4
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	21

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Radio interference checks	2
Voltage and load checks	4
Meters tested - customer's request	2
New meters shop tested	3
Faulty meters repaired or replaced	3
Damaged meters and covers	1
Residential read-ins	217
Residential read-outs	179
Residential disconnects	0
Residential reconnects	0
Meters resealed	1
Meters changed out due to load	3
Residential services and meters removed	3

Consumption and revenue (Accrual):

	No. of Meters	KWH	Revenue
Residential - Schedule 1	7002	4,000,000	$44,000.00
Commercial - Schedule 2	369	2,600,000	21,480.00
Totals	7371	6,600,000	$65,480.00

RICHLAND ELECTRICAL UNIT

COMMENTS

Street light system improvements during month were as follows:

Replaced five rotted poles, added two new poles and three new lights to curve in Sanford Avenue between Thayer and Duportail - partially improved circuit location.

Installed two mercury vapor lights to road entering Columbia Playfield from Stevens Drive. Vandals demolished glass reflector bowl to one nearest Stevens Drive the first night of operation. New reflector was ordered from manufacturer.

Another luminaire was broken at Humphreys and Wright.

Replaced and relocated street light pole at Rochefontaine and McPherson.

New primary poles replaced and transferred as follows:

Replaced two rotted poles and transferred circuits at Goethals and Jackson.
Replaced one rotted primary pole on Rochefontaine near McPherson, transferred circuits.
Replaced two rotted primary poles and transferred circuits in rear of 103 Goethals.
Replaced rotted transformer pole and relocated new pole and guy in rear of Warren Court. Transferred transformer and circuit.
Replaced six rotted primary poles, transferred transformer, circuits and cables between Thompson and Tinkle west of Sanford. Relocated all poles to new property lines.

Planned outages to expedite work during month:

Outage to lighting transformer in rear of C.C. Anderson's to rearrange lighting circuits from transformer. One hour.

Planned outage to transformer to Richland Laundry to correct low voltage condition to Laundry. One-half hour.

Planned outage to lighting transformer supplying 1206 Van Giesen to rearrange secondary and connect TV amplifier to system. Thirty-five minutes.

Planned outage to Line 12 in rear of 103 Goethals to transfer line to new pole and replace three spans of defective primary line. Two hours.

Rearranged three flood lights to bus stop at C.C. Anderson's to operate from automatic street light controls, supplanting manual operation.

Removed services from five prefabs due to excess and removal of houses.

Disconnected 7200 volt service to VFW carnival.

RICHLAND ELECTRICAL UNIT

Traffic signal improvements and rearrangements during month:

Installed new traffic light to George Washington Way and McMurray Road.

Moved flasher unit from George Washington Way and McMurray Road to Swift and Wright.

New service connections were made to the following locations:

Contractor at Central United Protestant Church site.
VFW carnival.
1941 Davison.
To cooler and saws at Warehouse No. 13.
To 30 television amplifier services.
To 700 Area roofing stove.

Miscellaneous repairs to fire alarm system. Cleared ground in No. 3 circuit.

Connected auxiliary fire alarm at Jefferson School to municipal system.

Improved and rearranged wiring to two terminal boxes to establish proper sequence for tracing circuits.

Disconnected auxiliary system to Jefferson School because of trouble caused to municipal system by contractor engaged in rearranging school system.

Removed fire alarm box at 706 Building due to building renovation.

Trimmed trees from fire alarm open circuits to remove multiple grounds.

Repaired fire alarm box No. 128 at heavy equipment yard.

Electrical repairs to domestic water system:

Repaired loose terminals to main buss to H well causing switch to open.

Replaced rotor to No. 1 motor to No. 5 station formerly removed for repairs to motor shaft.

Replaced ground wire to Well C damaged by digger.

Initiated measures to replace burned out coil to automatic lubricator on motor to Well F.

No call-out time for emergency repairs during month.

COMMUNITY OPERATIONS SUB-SECTION
ENGINEERING UNIT
MONTHLY REPORT
JULY 1954

PERSONNEL:	Exempt	Non-Exempt	Total
Employees - Beginning of Month	6	3	9
Transfers In	1	1	2
Transfers Out	0	0	0
Terminations		1	-1
Total End of Month	7	3	10

BUILDING PERMITS ISSUED IN JULY:

1. Central United Protestant Church - Structural Only
2. Catholic Church - Structural
3. Garage Permit

NEW MUNICIPAL CONSTRUCTION STARTED IN JULY:

1. Paving George Washington Way
2. Walks and Drives, Swimming Pool
3. Paving of Catskill Street and Rainier Avenue
4. Air conditioning, Community House
5. 8" Water Main Replacement, Duane Avenue, Lee Boulevard to Gillespie Street
6. Additions to Riverside Park

NEW PRIVATE CONSTRUCTION STARTED IN JULY:

1. Central United Protestant Church
2. Garages

ENGINEERING JOBS COMPLETED IN JULY:

C-70510 Henry W. Weber - "As Built" Plans

C-70511 Kaiser's Market Addition - "As Built" Plans

C-11879 Water Consumption Estimates

ESR I 90434 Revised Legal Description, Catholic Church

ESR I 90804 Legal Description, Safeway Building #1

ESR I 90894 Legal Description, Plot South of Linn Motors

ESR I 90984 Legal Description, 737 Stevens Drive (Formerly Morning Sun Dairy)

L-394 Replace Tennis Court Fences, Riverside Park. Project completed and accepted July 20, 1954.

1215092

ENGINEERING UNIT (Cont.)

STATUS OF ENGINEERING UNIT PROJECTS:

CA-570 Replace Raw Water Line #5 Well to Lee Boulevard - Design completed and forwarded to A.E.C.

CA-577 Improvements to Existing Streets, George Washington Way - Revision #1 approved by General Electric Co. July 29, 1954 for additional paving between McMurray Street and Catskill Street. Construction on George Washington Way progressing rapidly.

L-004 Guthrie Avenue Sidewalk - Gilmore to Goethals - Design complete. Contracting delayed when bid received June 25, 1954 was too high.

L-384 Improvements to Medical Arts Building, Service Drive - Design complete. Construction delayed when bid received June 25, 1954 was too high.

L-728 Installation of Fire Insulated Fire Alarm Wire - To be completed as location furnished by the Fire Department.

L-734 Sewer & Water Lines to Richland Heights Baptist Church - Water service installed. Sewer service to be completed on temporary basis to avoid cutting irrigation canal while full of water.

L-884 Relocation of 8" Water Main on Duane Avenue, Lee Boulevard to Gillespie Street - Construction work 99% complete.

IR-165 Parking Facilities, Kadlec Hospital - Design complete. Construction delayed when bid received June 25, 1954 was too high.

IR-167 Erosion Control & Development, FY 1953, Part I - Work under contract to start August 10, 1954.

IR-171 Automatic Bar Screens Sewage Lift Station - Re-advertising of job to be scheduled for January 1955. No bids received on first advertising.

IR-173 Air Conditioning, Community House - 45% complete. Work started July 13, 1954.

IR-174 Electricity Metering, Richland Domestic Water System - Equipment being ordered.

IR-175 Expansion of Riverside Park - Construction work started July 29, 1954.

IR-176 Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park - Design 100% complete.

IR-182 6" Water Main, Stevens Drive, Kadlec Hospital to Central UP Church - Plans and Specifications being reviewed by A.E.C.

ENGINEERING UNIT (Cont.)

STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS:

ESR I 90234 Inspection, Bauer Day Housing - 99% complete. Minor exceptions yet to be cleared.

ESR I 90324 Design, Engineering, Inspection, Walks, Drives at Columbia Playfield - Construction progressing rapidly.

ESR I 90594 "As Built" General, Part II - 71% complete. Work progressing.

ESR I 90604 Title III Services, Storm Drain, George Washington Way - 95% complete. Cleanup to be completed.

ESR I 90634 Kadlec Hospital Grounds Improvements - Design complete.

ESR I 90724 Extension Duane Avenue Shelterbelt - Project still under consideration.

ESR I 90914 Utility Lines, Legal Descriptions and Diagrams for Churches - 90% complete.

ESR I 90944 Erosion and Dust Control, 300 Area - Project submitted to A.E.C. by Engineering Department.

ESR I 91014 Retirement of Separate Irrigation System - Design work in progress.

ESR I 91024 Retirement of Irrigation Canal - Design work in progress.

ESR 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-00547 Design, Inspection, Catskill Street - Construction 5% complete.

C-70502 Study - Land between Newton Street & Desert Inn - 75% complete.

C-70512 Automatic Laundry Co. (Penny Building) - "As Built" Plans - Deferred for other work.

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:

ENGINEERING UNIT (Cont.)

BUILDINGS UNDER CONSTRUCTION (Cont.)

First Baptist Church (Richmond and Raleigh Streets) - Construction 92% complete. No progress this month.

Assembly of God Church - Construction 86% 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, Safeway Store - Construction 98% complete. Open for business.

Plans, Specs., Inspections, KH Kidwell Service Station - 100% complete. Final inspection made July 26, 1954.

Plans, Specs., Inspections, Church of Nazarene Addition - Construction 69% complete. No progress this month.

Plans, Specs., Inspections, Seattle First National Bank Addition - Construction materially complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, Richland Heights Baptist Church - Construction 70% complete. Construction progressing rapidly.

Plans, Specs., Inspections, Richland Baptist Church, G. W. W. - Construction 90% complete. Work progressing normally.

Plans, Specs., Inspections, LG Cook Construction & Maintenance Building - Construction 99% complete. Final inspection to be made.

Plans, Specs., Inspections, Pleiss-Davis Addition - Construction 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, LG Cook Building Addition - Construction 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, Christ the King Parish (Catholic) - Construction 20% complete. Work progressing normally.

Plans and Inspections, Rest Rooms, Desert Inn - 100% complete. Final inspection to be made.

Plans, Specs., Inspections, Central UP Church - Construction 2% complete. Work progressing normally.

COMMUNITY OPERATIONS SUB-SECTION
RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
JULY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	4
New Hires	0	0
Terminations	0	0
Transfers - In	0	0
Transfers - Out	0	0
End of Month	3	4

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of July 31, 1954:-

Administration	7
Principals and Supervisors	13
Clerical	24
Teachers	0
Health Audiometer	0
Cooks	0
Bus Drivers	0
Maintenance	22
Operations	46
	112

CLUBS AND ORGANIZATIONS

As of July 31, 1954, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council	1
Boy Scouts	1
Campfire Girls	1
Hi-Spot Club	2
Girl Scouts	2
Justice of Peace	1
Y.W.C.A.	2
Chamber of Commerce	1
	11

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business, Professional, Service & Governmental		18
Churches and Church Organizations		31
Civic Organizations		7
Schools, Alumni Groups, & P.T.A.'s.		25
Fraternal Organizations		25
Political Organizations		7
Recreation and Social Clubs -	Crafts and Hobbies	8
	Dramatics	1
	Dance	6
	Nature and Outing	7
	Music	8
	Social	13
	Sports	19
Veteran and Military Organizations		14
Welfare Groups		11
Youth - Boy Scouts		20
Girl Scouts		49
Campfire Girls		36
Miscellaneous		16
		321

RECREATION

The regular meeting of the Parks and Recreation Board was held on July 20. The Board was advised that preliminary grading and cover work had been accomplished on the parking lot at the Community House. The Board was informed that black-top has been placed in the immediate holes under the play equipment at Columbia Playfield and Riverside Park. Also, that two (2) street type mercury vapor lights were installed in the parking area at Columbia Playfield. The next regular meeting of the Board is scheduled for August 18, 1954.

Work was completed during the month on the installation of new tennis court back stops at Riverside Park.

Attendance Statistics - July, 1954

		No. of Sessions	Youth	Adults	Spectators	Sub-Total
A.	**Community House**					
I.	**Rec. Unit Supervised Programs**					
	Games Room Activities	26	1 442	292		1 734
	Arts & Crafts Class	7	155	9		164
II.	**Affiliated Programs**					
	Hi-Spot Club (Teen Age)	8	2 670	48		2 718
	Int'l. Folk Dancers	6	7	84		91
	Jr. Sportsman Club	1	6	3		9
III.	**Rec. Unit Special Events**					
	None					
IV.	**Non-Unit Special Events**					
	None					
V.	**Other Comm. House Bookings**					
		19	15	588		603
	Sub-Total	67	4 295	1 024		5 319
B.	**Parks and Playgrounds**					
I.	**Rec. Unit Supervised Programs**					
	Juvenile Fishing	31	310	60		370
	General Play-Riverside	31	6 425	7 585		14 010
	General Play-Columbia	31	1 842	3 344		5 186
	Play-For-Fun League	6	483	38	365	886
	Triple-O-League	4		407	162	569
	Dramatics	4	70	4		74
	Story Telling	4	304	4		308
	Tumbling	7	61	7		68
	Wading Pool - Riverside	31	2 288			2 288
II.	**Affiliated Programs**					
	Int'l. Folk Dancers	3		80		80
	Jr. Baseball League	7	140		350	490
	Lakeshore League	2		40	100	140
	Tennis Clinic	4		37		37
	Little League (Jeff.)	16	510	108	5 000	5 618
	Jr. Softball League	14	280	28	450	758
	Rich. Softball Assn.	25		1 500	1 753	3 253

RECREATION AND CIVIC AFFAIRS UNIT — JULY 1954

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
III. Rec. Unit Special Events					
Band Concert	2		100	650	750
Doll Show	1	62	5	100	167
Pet Show & Parade	1	10	3	120	133
IV. Non-Unit Special Events					
Girl Scout Day Camp	5	838	114		952
V. Baseball & Softball Bookings					
All Practice Fields	210	3 150	610		3 760
VI. Estimated Use of Non-Supervised Playgrounds					
Neighborhood Playgrounds	31	8 100	2 190		10 290
Sub-Totals	470	24 873	16 264	9 050	50 187

SUMMARY OF STATISTICS

Community House	67	4 295	1 024	-0-	5 319
Parks & Playgrounds	470	24 873	16 264	9 050	50 187
Total July Attendance	537	29 168	17 288	9 050	55 506

Grand Total for July 55 506
Cal. Year Total To Date 205 003

COMMUNITY OPERATIONS SUB-SECTION
WATER AND SEWERAGE UTILITIES UNIT
MONTHLY REPORT
JULY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	*5	22.5
Transfers Out	-	-
Transfers In	-	-
New Employees	-	-
Terminations (Deactivated)	1	-
Total End of Month	5	22.5

* One shift supervisor on loan from Public Works Unit included in figure.

DOMESTIC WATER

Normal operations were continued throughout the month. Water consumption was higher than during any previous experience.

Considerable trouble and complaints were experienced because of sand in the domestic water system. Some relief was temporarily given by isolating the distribution system and removing sand from affected areas by blowing fire hydrants. Some isolated cases of sand trouble reoccurred and we have been able to give only temporary relief. The sand problem has been studied considerably and it appears quite evident that most of the sand is coming into the system through the sand trap on the George Washington Way feeder main. Some further study is being made to determine the source of sand entering the distribution system and recommendations will be made as a result of the study.

No. 4 well pump was pulled for over-haul on July 28 as a result of shaft bearings being cut out by excessive sand pumping. Over-haul was completed and the pump was reinstalled and returned to service 8-3-54.

On July 29 a 4" post indicator valve was installed on the fire service line to D & E south wings of Kadlec Hospital. This installation was made to facilitate repairs to the service line which had been leaking for some time.

Community Operations
Water and Sewerage Utilities Unit

The south half of the 3000 Area recharge basin was dried up and cleaned by windrowing the silt deposit. This was completed and water returned to the basin on 7-26-54.

DOMESTIC WATER

	Well Production Million Gallons	Average Daily Production	Total Consumption Million Gallons	Av. Daily Consump.
Richland	188.0000	6.0645	688.8762	22.2218
North Richland	542.0200	17.4845	96.6194	3.1168
Columbia Field	103.1042	3.3259		
300 Area			50.8436	1.6401
TOTAL	833.1242	26.8749	836.3392	26.9787

Maximum daily consumption was 33,833,700 gallons on July 6, 1954.

SEWERAGE SYSTEM

Normal operations were continued throughout the month.

Three sewer main stoppages were cleaned out during July. One of these was due to roots from trees growing directly over the sewer main. Plans have been made to remove the trees.

Repair parts have been received for the digestor mixers at the sewage treatment plant and these units will be reinstalled as soon as time permits.

90,000 gallons of sludge was pumped to drying beds during the month.

SEWAGE

	Total Flow Million Gallons	Average Daily Flow Million Gallons
Plant No. 1	39.300	1.2677
Plant No. 2	89.627	2.8912
Total	128.927	4.1589

IRRIGATION SYSTEM

Operation remained normal throughout the month.

One ton cylinder of chlorine was applied to the canal at the fish screens for weed growth control as an experiment, and some benefit has been indicated.

COMMUNITY OPERATIONS SUB-SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
July 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees - Beginning of Month	4	8
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
End of Month	4	8

GENERAL

Circulation

Books	20,090
Magazines	463
Pamphlets	55
Records	657
Inter-Library Loans	29
Grand Total	21,294

Current Book Stock

Books added this month	420
Books withdrawn this month	
Grand Total	31,034
LP Phonograph Records added	125
LP Phonograph Records discarded	42

Registration

Adult	229
Juvenile	92
Total	321
Total Registered Borrowers	17,082
Children's Story Hour Attendance	253
Meetings in North Hall	15

Library Unit

Miss Berniece McCulloch, Reference Librarian, attended the Institute of Government, Washington Library Association and American Heritage meetings in Seattle, Washington, July 14-16.

On July 31, forty-nine children had completed their required reading of 10 books to become winners in the Children's Summer Reading Club. An additional one hundred and fifteen children had completed five or more books. It would be presumed from these figures that at least an approximate 165 children will be winners for this year.

It is interesting to note that the circulation of library materials for this month is an 8,000 increase over the circulation for July 1953.

COMMUNITY OPERATIONS SUB-SECTION
PUBLIC WORKS UNIT
MONTHLY REPORT
JULY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	*4.0	53.5
Transfers Out	-	-
Transfers In	-	-
New Employees	-	1
Terminations	-	1
Total End of Month	*4.0	53.5

*Figure does not include one Foreman who is on loan to Water and Sewerage Utilities Unit.

SANITATION

Total weight of garbage and trash collected and disposed of during July was 1308 tons. All collections were suspended on July 5, which was observed as a holiday, and routes normally scheduled for this date were made up on the following day. It was necessary to make a garbage collection at commercial facilities on Saturday, July 3 to avoid a sanitation problem over the three day holiday week end.

A survey was made of the amount of waste removal services required at all facilities (except residential) during the period of 7-19-54 through 7-30-54, and the data obtained will be used as a basis for determining equitable charges for the service.

ROADS AND STREETS

The application of a light bituminous surfacing to the parking lots at the Recreation Hall and Community House, and W-20 office building was completed during the last week of July.

The asphalt surfacing on Johnson from Van Giesen to a point approximately 100' south had deteriorated due to poor base material, and a new base and surfacing was placed at this location.

The shoulder and gutter line in the 900 block on Cullum was regraded and pre-mix was laid in to the edge of the sidewalk.

12:5:64

The drive from Lee to Knight, past W-10, was patched out, and an asphaltic pad was laid over the entire surface.

Street surfacing was replaced at five locations where excavation had been made for water line repairs.

Dressing up of gravel gutters, including removal of sod, grading, and laying in of 3/4" minus material was completed on the 1100 block on Winslow and on Longfitt, between Thayer and Wright.

Curbs and street center-lines which are to be painted by a contractor were prepared for paint application by removal of grass sod which had grown over the curbs, and water flushing of dust and debris from the center-line.

Removal of excess crushed rock remaining on streets which were "Seal-coated" is now in process.

Construction work on project CA-577 "Improvement of George Washington Way from Symons to Catskill", was commenced on 7-9-54 and the job was approximately 40% complete at end of the month.

The installation by a contractor of a storm sewer on George Washington Way from an existing sewer at McMurray to the drain ditch east of George Washington Way and just north of Newcomber has been completed with exception of miscellaneous clean up work.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks, were continued.

PARKS AND PUBLIC GROUNDS

The conversion from unsatisfactory rotary pop-up type sprinkler systems to quick coupling (snap-on) type systems has been completed at Riverside Park and the dike, and is 50% completed at Columbia Playfield.

"Notice to Proceed" was issued on 7-10-54 to Cascade Engineering Company for construction work under IR 175 "Extension of Riverside Park South", and IR 167 "Installation of Irrigation System-Jefferson Playground". The contractor has until 9-25-54 to complete this work.

Routine seasonal maintenance of park buildings, equipment and grounds; shelterbelt areas; and public grounds were continued.

RADIOLOGICAL SCIENCES DEPARTMENT

JULY 1954

Summary

Sixteen informal, 6 Class I and 2 Class II radiation incidents were recorded.

There was no further amplification of the ruthenium deposition problem, the study of which remained as the first priority task of the department.

Exposure analysis for the first six months of the year indicated a situation substantially on target for the bogey exposures for the year.

Research and development items of interest included:

1. Skin damage by ruthenium particles on pigs began only at high dose levels, but once begun was unexpectedly severe in area and depth.

2. Uptake of ruthenium from particles ingested is only 1% of that from ruthenium solution (which, however, appears to be one-hundred fold higher than the "official" value).

3. There is promise of a rapid separation of plutonium for bioassay.

4. A new hand and foot counter for simultaneous alpha and beta measurements may lead to impressive savings.

RADIOLOGICAL SCIENCES DEPARTMENT

JULY, 1954

Organization

The month end force of 367 included 39 supervisors, 88 engineers and scientists, 19 clerical and 221 other personnel.

Number of Employees on Payroll

Beginning of Month	-	372
End of Month	-	367
Net decrease	-	5

General

There were 16 informal, 6 Class I and 2 Class II radiation incidents.

There was no intensification of the ruthenium problem. Clean-up of construction areas proceeded rapidly, and plans were made to clean required portions of operating areas. In the reservation at large control will be by restricting access to roads only wherever possible.

Preliminary results from the various hurried researches on the ruthenium particulates were, on the whole, in the direction of indicating that the risk of damage may be less than would be calculated in the absence of these experiments. The finding, though favorable, does not materially alter the need for improved control of the ruthenium situation.

Substantial improvements were made in the development of unit costs in the department.

Training activities included the showing of a film on radioisotope handling and the continued training of AEC Fellows, together with attempts at their placement.

All persons scheduled to attend the Island Camps have now done so. The department plans an internal conference to consolidate and utilize the significant findings.

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 invention 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.

INVENTION	TITLE
None	None

RADIOLOGICAL ENGINEERING

Radiological design efforts included participation in the scoping of pile atmosphere storage tanks to allow changing of pile gas under various operating conditions, studies of problems of possible alternate pile atmosphere gases, and investigation of possible problems of a new laboratory for irradiated reactor tubing examination.

The feasibility of reactor effluent inland disposal around Gable Mountain was reviewed assuming single point test results were representative of the entire area and a flow to lake of 91,000 gpm. Tentative conclusions include: formation of swamps near the river from 100-F to Hanford within six months of lake formation; no planned overflow would be needed for about ten years; and the Hanford - White Bluffs highway might be adversely affected. Additional experiments at the test sight indicated a natural ground water movement of about 170 feet per day. The need for further geological-hydrological investigations is indicated.

RADIOLOGICAL RECORDS AND STANDARDS

Radiation Monitoring Unit

	June	July	1954 to Date
Special Work Permits	470	582	3,805
Routine and Special Surveys	1,334	1,253	11,047
Air Samples	1,142	1,209	10,283
Skin Contamination	12	19	127

Additional spread of particulate contamination from the Redox stack late in June made it necessary to again decontaminate several hundred acres of ground in construction areas and military camps. Special studies on this particulate contamination in the Biophysics laboratory resulted in contamination spread to parts of the building on two occasions and in the localized skin overexposure of two employees. (Class I, No. 371 and Class II, No. 76)

Radiological Sciences Department

During experimental pile work, an engineering assistant received an exposure slightly above permissible limits due primarily to neutrons. (Class II, No. 77)

During a research study in the Biophysics laboratory a radium source was inadvertently dropped to the floor. The container holding the capsule itself remained intact. (Class I, No. 375)

Radiological Standards

Radiation Incidents

Type	June	July	To Date
Informal	20	16	169
Class I	9	6	48
Class II	0	2	12

The Class II incidents involved two cases of localized skin exposure to particulate contamination and one case of whole body exposure to neutrons. The Class I incidents included three contamination problems, one case of excessive batch size, the mishandling of a radium source, and a plutonium fire.

A pamphlet entitled "Radiation Protection for You at HAPO" was completed and is being distributed to personnel through the Radiation Monitoring Units.

Exposure Records

During the first six months of 1954, 99 General Electric employees showed an accumulated whole body gamma exposure of more than 1 roentgen and 59 employees, a whole body beta plus gamma exposure of 2 rads. The corresponding numbers of employees in these categories for 1953 were 65 and 51 respectively. Only 9 non-General Electric employees showed a gamma exposure greater than 1 roentgen in the first six months of 1954; and only 8, more than 2 rads. In the first six months of 1953, 45 Minor Construction employees were above the 1 roentgen level and 14 above the 2 rads level. The annual bogey for whole body radiation is 3 roentgens or equivalent.

Radiological Sciences Department

Personnel Meters, and Records and Photometry

	June	July	1954 to Date
Gamma Pencils read	232,902	207,893	1,557,986
Potential overexposures	14	12	79
Confirmed overexposures	0	0	0
Slow neutron pencils read	1,372	1,194	7,988
Potential overexposures	0	0	1
Confirmed overexposures	0	0	0
Beta-Gamma film badges processed	40,744	35,525	285,333
Potential overexposures	49*	90	432
Confirmed overexposures	0	0	0
Fast neutron badges processed	575	524	3,102
Potential overexposures	2	1	5
Confirmed overexposures	0	1	1
Lost readings (all causes)	1,246*	86	1,542

*Corrected figure

Bioassay

Plutonium Analyses

Samples assayed	625	659	5,401
Results above detection limit*	18	22	175
Resamples assayed	36	37	259
Results above detection limit*	8	10	72
Maximum d/m/sample	2.32	1.46	2.32

*Detection limit was 0.05 d/m

Fission Product Analyses

Samples assayed	629	710	5,819
Results above 10 c/m/sample	2	22*	34

*The results above 10 c/m were on samples obtained from personnel involved in contamination spread at the Redox building in June. No result indicated significant body deposition.

Uranium Analyses

Results of 293 samples processed this month are tabulated below. This brings the total number of samples processed in 1954 to 1,944.

	End of 4th Day Exposure /ug/liter			End of 2 Days-No Exposure /ug/liter		
Sample Description	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Metal Preparation	14.4	2.7	63	6.4	1.5	38
Technical	17.5	4.9	9	16.2	5.8	11
UO_3 Plant	39.1	6.2	170	-	-	-

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Radiological Sciences Department

One result of 109 /ug/liter reported at the UO_3 Plant last month was investigated and represented an initial deposition of soluble UO_3 of less than 10% of the MPL. Three results above 25 /ug/liter this month are under investigation.

Tritium Analyses

	Activity Density (/uc/cc x 10^3)						1954
	0-5	5-10	10-35	35-70	>70	Total	To Date
Number of Samples	172	4	2	0	0	178	1,662

Thyroid Checks

All thyroid checks reported were below the warning level.

Hand Score Summary

There were 51,931 alpha and 77,008 beta scores reported. About 0.015% of the alpha and 0.02% of the beta scores were above the warning level. Eight high alpha and 10 high beta scores reported in the 325 Building showed no attempt to decontaminate. Investigation is in progress. Decontamination of all other reported high cases was attempted and was successful.

Calibrations

	Number of Routine Calibrations		
	June	July	1954 to Date
Fixed Instruments	33	91	505
Portable Instruments	3,530	3,110	22,904
Personnel Meters	18,158	15,834	114,319
Total	21,721	19,035	137,728

BIOPHYSICS

Control Unit

Regional Survey

The general findings are summarized in the following table:

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er reported at the UO_3 Plant last month was
ted an initial deposition of soluble UO_3
PL. Three results above 25 /ug/liter this
ation.

Activity Density (/uc/cc x 10^3)					1954
5-10	10-35	35-70	>70	Total	To Date
4	2	0	0	178	1,662

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Number of Routine Calibrations

June	July	1954 to Date
33	91	505
3,530	3,110	22,904
18,158	15,834	114,319
21,721	19,035	137,728

ce summarized in the following table:

Activity Type	Average Activity Density /uc/cc
alpha	1.5×10^{-8}
alpha	$(<0.5 \text{ to } 1.5) \times 10^{-8}$
beta	$(<0.5 \text{ to } 2.2) \times 10^{-7}$
beta	$(<0.5 \text{ to } 2.1) \times 10^{-7}$
beta	$(7.0 \text{ to } 7.4) \times 10^{-3}$ /uc/g
beta	$(0.9 \text{ to } 2.0) \times 10^{-7}$
beta	1.0×10^{-5} /uc/g
beta	2.3×10^{-5} /uc/g
alpha	No Sample
alpha	No Sample
U	No Sample
beta	$<5 \times 10^{-8}$
beta	3.3×10^{-6}
beta	$(1.5 \text{ to } 3.3) \times 10^{-6}$
beta	$(1.7 \text{ to } 3.0) \times 10^{-7}$
beta	$(0.2 \text{ to } 1.5) \times 10^{-4}$ /uc/g
beta	$(<0.5 \text{ to } 3.1) \times 10^{-7}$
beta	13,000 to 21,000 /uc/sec/reactor
	$(3.7 \text{ to } 6.4) \times 10^{-3}$
lpha	<0.03 /uc/sec/reactor
131	$<5 \times 10^{-9}$
	22 /uc/day
131	4.2×10^{-7}
	9.2×10^{-8}
lpha	$(<0.4 \text{ to } 2.5) \times 10^{-14}$
ta-gamma	0.9 to 30 mrads/day
ta-gamma	0.3 to 1.0 mrads/day
ta	$(2.6 \text{ to } 5.5) \times 10^{-13}$
31	$(<0.4 \text{ to } 6.2) \times 10^{-13}$
31	<0.03 curie/day
103,106	<0.36 curie/day
ta-gamma	No Measurements
-	0.02 to 0.16 ptle/m^3
-	0.01 to 0.33 ptle/m^3
T	1.1 curie/day

Radiological Sciences Department

Vegetation

		μc/g
Environs of Separations Areas	I^{131}	$(0.3 \text{ to } 1.2) \times 10^{-5}$
Residential Areas	I^{131}	$< 3 \times 10^{-6}$
Eastern Washington and Oregon	I^{131}	$< 3 \times 10^{-6}$
Non-Volatile Beta Emitters Washington and Oregon	beta	$(3.9 \text{ to } 9.0) \times 10^{-5}$
Alpha Emitters - Separations Areas	alpha	$(0.3 \text{ to } 1.6) \times 10^{-7}$
Alpha Emitters - 300 Area	alpha	5×10^{-8}

*Troublesome delayed emissions from stack coating above the monitor would not be included here.

General ground contamination continued in and around 200-W Area with maximum dosage rates, based on field measurements, ranging from 1 to 2 rads/hour at locations within several thousand feet of the Redox stack; no significant increase in contamination was noted with resumption of Redox operations. General ground contamination with dosage readings as high as 1 rad/hour was noted southwest of the 100-D Area with the contaminating material being composed of over 90 percent ruthenium-rhodium isotopes.

Fallout of radioactive particles was noted at local and remote locations during the month with maximum concentrations of these airborne particles from 0.1 to 0.5 particles/cubic meter observed at Walla Walla, Klamath Falls, and Boise over the period July 4, 5, and 6; activity per particle was less than 10 d/m.

Float studies conducted in the Columbia River during high flow rates (2,900,000 gallons per second) showed that the minimum travel time for material admitted at 100-B Area to arrive at Pasco Filter Plant was approximately 9 hours.

Activity density of gross beta particle emitters in a sample of 107-DR effluent water collected on July 14 following a slug rupture was 0.015 μc/cc; measurements made at the Pasco water plant following this incident revealed that concentrations of radioactive barium and strontium, which might be expected from fission, were less than 2×10^{-8} μc/cc.

Analytical Laboratory

Routine and Special analyses were carried out as follows:

Control Laboratory

Type Sample	Analyses Completed June	July	To Date
Vegetation	1506	940	8,750
Water	2028	2033	14,472
Solids	289	218	1,678
Air Samples	501	339	3,362
Uranium (Fluorophotometer)	612	495	3,898
Oil Fog (Fluorophotometer)	375	576	1,458
Special Survey Samples (RMSS)	21	21	105
Special Survey Samples (RMU and RS)	69	53	294
Tritium Oxide	508	14	1,365
Total	6417	4689	35,382

The laboratory operation changed from two shifts to day shift only on July 12 after completion of necessary space revisions in 329 Building.

Control Services

Statistical analyses were completed of the background measurements of the tritium internal counter used by the Control Laboratory. Study of measurements on tritium-free samples established the quality control limits of the current operation with this counter. Studies were also undertaken to define the differences in wind speed measurements made by four anemometers in the Experimental Meteorology program.

Synoptic Meteorology

Type of Forecast	Number Made	Percent Reliability
8 hour production	93	87.9
24 hour general	62	87.8
Special	105	85.7

Temperatures averaged 73.9 which was somewhat cooler than the normal of 76.3; maximum temperature was 100° on July 14. All measurable precipitation occurred on July 9 and 10 and amounted to 0.22" - 0.07" more than the monthly normal.

Experimental Meteorology

Development work continued on the oil-fog technique for studying the diffusion of stack effluents during unstable meteorological conditions. Following recent improvements in technique, plans were initiated to resume the diffusion experiments in the field.

Additional modifications of the anemometer circuitry on the Portable Mast were tested.

Radiological-Sciences Department

Earth Sciences

Work continued on ground water velocity measurement in the Gable Mountain area.

Adsorption of Pu from nitrate solutions containing either acetate or sulfate anions in concentrations as great as 4 N was considerably less than from water solution. Pu adsorption from nitrate solutions containing excess nitrate or phosphate equalled that from nitrate water solution containing no additional anions.

Experiments with semi-permeable membranes and Pu nitrate in 0.24 M oxalic acid solution (pH ca. 1) indicated that the Pu existed therein as a colloid or as a large negatively charged complex ion.

Laboratory studies were begun on the phenomena of saturated and unsaturated flow of moisture through prepared soil columns.

Industrial Hygiene

Data collected in the survey of industrial noise at HAPO were analyzed. Preliminary review of the findings indicated 14 work sites where, according to HAPO criteria, hearing protection should be mandatory and 14 where it should be optional.

The comprehensive study of protection afforded by respirators and masks used at HAPO was continued. Tests were conducted to show the efficiency of the various filter media, the over-all protection afforded by the equipment, and the amount of face-piece leakage under different conditions of usage. The study included measurements with the respirator testing apparatus and with human subjects. An interesting sidelight was the conflict between the requirements for hirsute adornment appropriate to Atomic Frontier Days and the contrary requirements of good fit of a mask to the skin for adequate protection.

Methods

Eighty to eighty-five percent of the plutonium in rat urine containing metabolized plutonium can be removed by filtration through a Millipore filter. Tests are proceeding on the application of this finding to the development of a rapid plutonium Bioassay procedure.

The gamma ray spectrometer was used in a cooperative study with Earth Sciences of a 40-foot soil column through which a process solution had been passed; the distribution of many of the adsorbed radioisotopes can be determined in this way.

Radiological Sciences Department

The diffusion cloud chamber for counting tritium in underground water was fabricated and the components for the auxiliary equipment were obtained; preparations were made for pressure and low temperature tests.

Very high specific activity particles of radio-ruthenium oxide suspended in a detergent-water solution were prepared for use in the Biology Section study of the effect of such particles in the lung cavities of mice.

A rapid procedure for measuring the dissolution rates of UO_2 particles was developed which will allow the determination of the effect of agitation on the rates.

Physics

Neutrons of about 0.1 Mev energy were produced with a Li-F target, in the positive ion accelerator, but improved target life is needed.

A Redox stack particle giving about 2.5 rad/hr survey reading was measured with film and with a small ion chamber. The results of the two methods were in good agreement and gave 200 rad/hr at 0.1 cm and 20,000 rad/hr at 0.01 cm. These are in good agreement with calculated values given last month.

Studies were made of the source of the age effects in geiger counters; the amplitude and threshold intensity effects previously discovered are due to changes in the electrodes in the tube, presumably deposition of breakdown products of the counting gas thereon.

A scintillation counter arranged for measurement of gamma ray emitters within the body was used on plant personnel who had been exposed to particles released at the Redox stack. Five contaminated individuals were found. The case of greatest contamination was studied in detail; there was about 0.25 μc (assumed to be ruthenium) in the lung which was eliminated from the chest region with a half value time of 2 to 3 weeks.

Curves were prepared from which the surface dose rate of thorium metal could be found if the previous history of the metal were known; these were checked against experimental measurements with an extrapolation chamber.

Instrument Development

Fabrication of the automatic filter monitor for measuring the beta counting rate of particulate material in air streams was completed. Progress was made on the assembly and testing of components for the similar continuous stack monitor for the determination of ruthenium and iodine by gamma-ray measurement.

Further tests of the low-cost scale of 100 indicated that, at a random counting rate of 60,000 c/m, the beam deflection tube scaler and miniature register yielded about 99% of the count registered by a conventional binary

scaler. A binary scale of 64 and conventional register will not scale accurately at this speed; a binary scale of 512 was used for the comparison.

A testing model of the hand probe for use in a combination alpha and beta-gamma hand counter gave encouraging results.

It was found that anemometers for the Portable Mast can be operated to the extreme accuracy required in the system only if they are provided with their own isolated d.c. supply; such a supply was designed.

A new electrometer circuit for portable instruments such as C.P.'s and Junos was developed to be simpler than those existing and to show battery weakening in calibration tests. A recent radiation incident was caused by absence of warning of such weakening.

BIOLOGY

Aquatic Biology

Highlights of the Columbia River Survey: Activity densities of river organisms (based on small minnows at Hanford) increased significantly with higher temperatures. Values immediately below the 100-H emergency flume remained high. Radioactivity of adult sockeye salmon netted at Hanford was near background. Only insignificant activity density was found in whitefish at Priest Rapids.

Selected values of interest were:

Organism	Location	Sample Type	Activity Density (uc/g) June	Activity Density (uc/g) July
Minnows (Shiners)	Hanford	Ave.	3×10^{-4}	8×10^{-4}
Minnows (Shiners)	Below 100-H	Ave.	1×10^{-3}	9×10^{-3}
Whitefish flesh	Hanford	Max.	2×10^{-5}	No Sample
Plankton	Hanford	Ave.	2×10^{-3}	2×10^{-3}
Midge Larvae	McNary Reservoir	Ave.	7×10^{-5}	3×10^{-5}

Effluent Monitoring

Survival of young, migrant-sized, sockeye salmon in 10% effluent was excellent until the end of July when the temperature of the mixture reached 20°C. Such fish would normally have moved out to the ocean several weeks ago. Similar results occurred with fingerling-size chinook salmon. Survival of the chinook salmon in 20° C. river water has been good for ten weeks.

Radiological Sciences Department

Biology Control Unit

Biological Monitoring

Rodent thyroid activity densities decreased uniformly at all collection sites, with a mean activity density of 7×10^{-4} μc/g. Fission product contamination in rabbit feces remained at the average value of 4×10^{-3} μc/g.

Clinical Laboratory, Radiochemistry and Microscopy

Routine supporting services were provided.

A device to separate tissue specimens from their underlying autoradiographic film was developed. The tissue may be stained apart from the emulsion, and the emulsion developed apart from the tissue. The tissue and film may be subsequently re-positioned exactly for comparison. This will be of value in delineating centers of radioactive element concentration, without film grain or tissue stain interference.

Experimental Animal Farm

Toxicology of I^{131}

Metabolism of sheep fed I^{131} as evidenced by thyroid radioiodine content was found to be essentially the same as last month and slightly lower when compared with the values obtained last year.

Three sows gave birth to thirty pigs. Two of these sows are being maintained on a 5 to 15 μc/day I^{131} regimen, the third sow is a control. Preliminary results by thyroid monitoring indicate that the newborn pig thyroid contains one-tenth or less of the daily dose of I^{131} fed the dam.

Irradiation of Pig Skin with Radioactive Particles

Definite tissue destruction is still obvious in four of the original seven areas of pig skin irradiated six weeks previously.

Areas irradiated to a surface dose of the order of 250,000 rads in five days are reddish-pink in color over approximately 8 mm diameter, with a central fibrous lighter colored area approximately 2 mm diameter.

Areas irradiated to about 1,000,000 rads show marked tissue destruction and retarded repair in an area over 1 cm in diameter.

Metabolism

Plutonium Absorption and Metabolism

Preliminary results indicate that within five to ten minutes after i.v. injection of plutonium (IV) citrate into the tail vein of rats, more than 50% of the plutonium in dialyzed serum migrated with the β-globulin fraction.

Radiological Sciences Department

Fission Product Absorption and Metabolism

Absorption of ruthenium from particles fed to two rats amounted to 0.05% and 0.01%. Tissue retention 48 hours after administration amounted to 0.01% and 0.003% of the administered dose. These results are a factor of approximately 100 times lower than the results obtained by feeding ruthenium solutions. Distribution was similar after feeding particles or solution, the kidney showing the largest ruthenium concentration. Since local results for solutions were 100 times higher than the "classical" data, one could speculate that the classical data were obtained with material biochemically equivalent to particles.

Pharmacology and Experimental Therapeutics

In ten days, CaEDTA appears to permit greater deposition of plutonium on bone than does zirconium. The plutonium solutions were administered either chelated with EDTA or mixed with zirconium citrate. This agrees with earlier findings employing these two agents after plutonium was injected.

Radioactive Particles Metabolism and Toxicology

Gross inspection of mice intratracheally injected with ruthenium oxide 100 days earlier revealed only some pulmonary hemorrhages, but no increase in tumor incidence.

Plant Nutrition and Microbiology

Absorption and Translocation of Radioelements in Plants

The concentration in bean leaves of both reducing and non-reducing sugars was found to increase with increasing concentration of Cr^{+6} from 0.1 to 5.0 $\mu g\ Cr^{+6}$/ml of nutrient solution. At higher Cr^{+6} concentrations the amount of sugars in the leaves decreased. In contrast to the increasing sugar, protein-nitrogen decreased as Cr^{+6} concentration rose, the decrease being most noticeable in root tissue.

Twelve milliacre plots have been planted to barley and each contaminated with one millicurie of strontium-90 in aqueous solution spread evenly over the surface.

[redacted]

FINANCIAL DEPARTMENT MONTHLY REPORT
JULY, 1954

In connection with the current revision in operating programs for FY 1955 and FY 1956 an entire revamp of the budgeted production costs for these years was completed during July. This budget revision included submission to the AEC of a revised personnel schedule for Hanford Atomic Products Operation on July 15, 1954 and the transmittal to the Hanford Operations Office Budget Division of production cost schedules as they were finished. These were completed by July 30 (except for two schedules to be finished early in August) and were utilized by the AEC in their revised submission to Washington. Also included in the budget revision were changes in the inventory budget that reflect the revised production program as well as changes in reserves for Excess and Standby to 80% and 25%, respectively. A revised schedule of budgeted overtime hours for Hanford Atomic Products Operation departments was also completed for use on payroll and consolidated reports.

AEC budget document (HAN 55000) made several changes to the Plant and Equipment items for FY 1955 and FY 1956 as submitted in our budget document HW 31001, Part III. These changes were summarized and reported to Department Managers with a request that comments be given as to the changes made. General Electric comments were consolidated and transmitted to AEC with a letter dated July 19.

An analysis of Work in Process Inventories was made and estimates prepared of the expected quantities and values at the end of Fiscal Years 1955 and 1956. These amounts were prepared in chart form along with unit cost information to be available during the visit of the Chairman of the Atomic Energy Commission.

Steps wereinstigated and a request for appropriation approved for the purchase of a Flexowriter, to be utilized in connection with the unitization of the K Area. This machine is designed to prepare a punched tape simultaneously with the typing of a unitization document. The tape subsequently will be utilized to prepare detail records, thereby saving duplicate typing. Plans were put into effect which will provide unitization of projects concurrent with the construction or alteration of new or added facilities, directing liaison with the contact engineers and witnessing the actual construction, providing a more equitable basis for unitization procedures.

A special study was started to assign a standard commodity code classification to all plant and equipment. The assignment of standard commodity code classification will generally conform to some standard set up and utilized by the AEC, in order to closely adhere to requirements of the AEC on a nation-wide basis.

[redacted]

Railroad materials in the custody of Transportation Section were physically inventoried on July 27, 1954. Results of the inventory reflected a difference of $1,759 over the reconciled book value of $39,863. Most of the overage was due to the salvaging of material from retirements of the rail system and materials left over from completed work orders.

Beginning with July business and each month thereafter inventory accounts will be adjusted, by means of an accrual, to reflect a more accurate value of inventory materials on hand at month end. The accrual will be made from the open document file maintained by Inventory Accounting containing receiving reports, accounts payable vouchers and other documents which represent the value of materials received but not billed and materials billed but not received.

An instruction has been received from the Commission redefining Current Use, Standby and Excess Stores Inventories and adding a new definition for Spare Parts. These two definitions are somewhat at variance with current HAPO practices and will require considerable reshuffling, especially in Spare Parts. Conferences are being held with interested management to reach decisions on how best to comply with the directive. The Commission's letter also directs that as of July 1, 1954, excess generated by construction contractors be physically segregated from excess generated by operating contractors. This does not impose any great problem and is now being carried out.

Appropriation requests approved during the month amounted to $164,375.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the AEC during the month amounted to $1,113,500.

A schedule detailing the source and disposition of cash receipts, including payroll deductions, representing payments of Accounts Receivable items, for the fiscal year 1954, was completed and submitted to the Commission as requested by them for consolidation in their Annual Financial Report to Washington, D. C.

On July 15, the Hanford Atomic Metal Trades Council ratified acceptance of the general salary increase effective June 10. Accordingly, payment of the increase to employees represented by the HAMTC, including the retroactive portion, was made in salary checks distributed on July 23.

Special Absence Frequency Reports were furnished to Section Managers covering 385 nonexempt employees whose absence frequency for the fiscal quarter ended June 27 was three or more in the case of male employees, and four or more in the case of female employees.

Provisional approval by HOO-AEC was received in July for reimbursement of the 1953 Company cost of the Pension Plan applicable to HAPO, pending execution of definitive agreements between the Company and the Commission with respect to reimbursement of Pension Plan costs.

Representatives of the Auditing Services Department, Schenectady, completed a three months' audit of HAPO operations in July, two men leaving on July 15 and the third on July 29. They were assisted in the local audit by personnel of the Internal Audit Unit, nine members of the Unit being assigned to the work during the period of peak activity and a lesser number at other times. All files of working papers were left in our possession for future reference.

Detailed reports for the Financial Department appear on succeeding pages, as follows:

SUMMARY OF CASH DISBURSEMENTS, RECEIPTS AND ADVANCES

A summary of cash disbursements and receipts (excluding advances of $6,150,000 and $5,375,000, respectively, by the Atomic Energy Commission) for the months of July and June, 1954, is shown below:

Disbursements	July	June
Payrolls (net)	$3 343 630	$2 826 513
Materials and Freight	1 740 849	1 447 231
Payroll Taxes	937 450	650 493
Payments to Subcontractors	589 021	547 752
United States Savings Bonds	220 314	188 840
Group Insurance Premium	134 605	265 980
Pension Plan - Employees' Portion	124 272	103 841
Travel Advances to Employees	71 596	78 409
Judgment - Connelly and Black, and Porter Cases	-0-	85 983
All Other	125 892	104 925
Total	7 287 629	6 299 967
Receipts		
Rent	122 331	132 629
Electricity	59 377	66 485
Hospital	53 675	85 347
Telephone	52 175	58 208
Sundry Accounts Receivable	15 849	8 420
Refund of Travel Advances to Employees	9 677	12 111
Refunds from Vendors	7 968	1 332
Bus Fares	7 266	7 793
Sales to AEC Cost-type Contractors	6 920	15 610
Group Insurance Experience Refund	-0-	151 640
Other	4 871	3 982
Total	340 109	543 557
Net Disbursements	$6 947 520	$5 756 410

Outstanding advances as of July 31 and June 20, 1954, were as follows:

	July	June
Cash in Bank - Contract Accounts	$2 094 551	$2 892 071
Cash in Bank - Salary Accounts	50 000	50 000
Total	$2 144 551	$2 942 071

AUDITS AND PROCEDURES SECTION
MONTHLY REPORT - JULY, 1954

Internal Audit

A report was issued during the month covering an audit of cash controls.

Reports were being prepared for completed audits of revenue of the Graduate School of Nuclear Engineering, and material and package passes.

During the month, audits were undertaken of the following:

Control of Safety Awards and of Employee Attendance and Service Recognition Pins
Printing and Reproduction Services
Telephone Usage
Medical Aid, Industrial Insurance, and Pension Awards

In making the audit of Medical Aid, Industrial Insurance, and Pension awards, an auditor went to Olympia to review the records and routines of the Department of Labor and Industries of the State of Washington.

At the request of the AEC, a survey was made among plant departments to determine the economies achieved by HAPO during FY 1954 or actions initiated which will result in future economies. A report of economy achievements is being prepared for submission to the AEC.

At the request of the Legal Department, a review is being made to determine whether the Company at HAPO is complying with the Fair Labor Standards Act.

During the month, the Traveling Auditors completed their audit of HAPO in which they had been assisted by internal auditors.

Administrative Planning

Organization and Policy Guides approved for printing during July totaled 173, a large number of which covered nomenclature and appointments, and functions and responsibilities. Among those issued were 37 nomenclature and appointment guides, including department, section and sub-section levels, and 22 dealing with functions and responsibilities.

New organization announcements were sent to Schenectady, to be included in the Atomic Products Division section of the Company's Organization and Policy Guide announcements.

A revised roster of exempt personnel for the Financial Department was furnished the Salary Administration Section for inclusion in the next HAPO organization directory.

Eight AEC transmittals were received during the month, of which three required General Electric compliance. Top secret clearance procedure, telecommunications, and utilization of excess IBM accounting machine panels, were the subjects on which compliance was requested and local G.E. officials acknowledged these transmittals.

Accounting Procedures

A second specialist in methods and procedures has been added to this group by the transfer of an employee from the Internal Audit Unit.

One business graduate from the University of Washington was enrolled in the rotational training program in July, while two were placed on permanent assignments in the Manufacturing Cost and Plant Accounting Units respectively, and a third was granted a leave of absence to attend a military encampment. There were five men engaged in the rotational training program at the end of the month.

The review of accounts payable procedures was continued, the study being expanded to include the possibility of the application of mechanical equipment. A new assignment was the drafting of an internal audit manual.

Reimbursement Accounting

The Reimbursement Accounting group made an analysis of actual charges against the overhead allowance (provided for under Modification No. 23 to the prime contract, effective June 1, 1953) for the last seven months of calendar year 1953, as compared with charges estimated at the time the allowance was negotiated with the AEC. This analysis included general corporate and administrative expenses allocated to operations under the AEC contract as well as local expenses.

Eight letter approvals, obtained from the Commission in accordance with OPG 05.4, were received in July. Considerable assistance was furnished other departments in preparing letters to the AEC to obtain such approvals.

- COST AND BUDGETS SECTION - MONTHLY REPORT JULY, 1954

Operating cost reports and related statements for the month of June, 1954 were issued only a few days later than the usual issue date despite the additional workload due to year-end closing. Analysis letters which accompanied cost reports to Department, Section and Unit Heads summarized activity for the full fiscal year and provided comparisons with prior year's activities.

Report of the study by Public Administration Service of the feasibility of community operation of Kadlec Hospital was received from the Commission on July 23. Assistance was rendered the Manager, Health and Safety Section in preparation of comments on this report to the General Manager, and work is continuing on preparation of more detailed comments to be forwarded to the Commission.

Assistance was given Internal Audit in connection with a review of the annual savings declared by all departments.

Consolidations and Budgets Unit

A proposal for preparation of a revised consolidated Operating Report for Hanford Atomic Products Operation was completed and the first report of this type will be prepared for the month of July. It is intended that this report will provide basic information for development of units of measurements and comparisons.

Revisions to Hanford Atomic Products Operation Cost Code books were completed during July that reflect the organizational changes effective July 1, 1954. Some additional changes will be necessary to conform with the Functional Organization charts.

Considerable effort was required to relate the inventory budget for FY 1955 and FY 1956 to the commodity listing, as requested by the AEC on July 2, 1954, and to provide additional justification for requested changes in inventory levels and additional funds requested for Equipment Not Included in Construction Projects.

Engineering Cost Unit

Meetings were held with representatives of the Project Section, Property Management and Stores relative to reserving for future use construction equipment made available upon completion of the present construction program. A plan for the orderly disposition of equipment was formulated and forwarded to the Commission together with a request for $5,000 to effect the initial steps of this plan.

The types of equipment included in the plan involve machine tools, special optical instruments, inspection tools, jigs, fixtures, interior construc-

tion cranes, electrical fork lift trucks and special trucks and dollies. The plan does not include earthmoving or excavating equipment, portable welding machines or air compressors, outside cranes, trucks or automobiles, hand tools, readily procurable "shelf items" or readily replaceable equipment in poor condition.

Accounts were established and a procedure for the handling of Minor Construction Stores was formulated in conjunction with representatives of the Minor Projects Sub-Section. It is contemplated that Minor Construction will assume the responsibility of stocking and maintaining a stores inventory to satisfy the needs of the work assigned them.

Meetings were held with representatives of the Project Section, Manufacturing Department, Manufacturing Cost and Property Management relative to the procurement and costing of Operational Spare Parts. Agreement was reached that Project Section personnel would include operational spare parts on construction purchase requisitions when specifically requested by responsible representatives of Manufacturing Department. Cost of these operational spare parts would be borne by the Manufacturing Department and not the construction project. Agreement was also reached that the modification or alteration of operational spare parts through design and scope changes would be the responsibility of the Project Section with cost of such changes and alterations to be borne by Manufacturing Department.

New reports were developed for reporting cumulative costs on Major Construction projects. The format of these reports has been so developed that costs are readily comparable to the official project estimate, as well as giving complete detail of source of cost for each separate feature of the project.

General Cost Unit

Cost reports issued for July, 1954 included revised budget data based on the recently announced intra-departmental reorganizations. In those cases where reorganization information was not received until late in the month, July costs were recast.

Work was completed and procedures were placed into effect as of July 1, 1954 to provide for centsless accounting for Plant Auxiliary Operations Department costs. Postings to cost ledgers as well as cost liquidations to other units are being made in dollar amounts.

As a service to Department Managers, considerable time was spent on their reports of personnel ceilings for the coming fiscal year, and on reports of economies effected by them in their operation during the past year.

Several months ago it was reported that procedures had been revised to provide for more equitable allocation of revenues from community water, sewerage and waste removal facilities. In July, rates applicable to consumption were revised in many cases and July reports reflect charges to customers at commercial rates.

Manufacturing Cost Unit

The fourth in a series of meetings with all Manufacturing Cost Unit personnel was held on July 2, 1954. The manufacturing processes in the Separations Section were the subject of this discussion which was supplemented by models of the Redox and Purex facilities. This meeting completed the first series which was designed to provide cost personnel with a better knowledge of the flow of uranium and plutonium throughout the manufacturing plants and to provide a general knowledge of the activities carried on within these plants.

A Business Graduate was transferred to Analysis and Studies to begin training in production cost work and to provide a replacement for a Financial Analyst being transferred to Internal Audit Unit. One Rotation Trainee accepted a permanent assignment in the Manufacturing Cost Unit and will provide a replacement for the transferred Business Graduate.

The task of recoding approximately 6000 work orders to conform with organization changes and the resultant revised code structure was completed. It was necessary to lend two people to Computing for two days in order to carry out the entire change over.

Essential Material Inventory personnel observed month end physical inventory of dry chemicals held by Separations Operations Units and stored in Building 2713-U, 270-U, and 275-E. In Reactor Section, the 100-F physical inventory of essential materials for the Operations Sub-Section was observed. Reports are being prepared covering these inventories.

Steam and water distribution within the 300 Area was revised as a result of a recent study which indicated a general revision was needed.

The Manufacturing Cost Ledger was redesigned prior to posting July costs. It was changed to allow posting of nine cost codes per cost unit on one sheet where formerly one code was posted. As a result, the number of pages in the ledger was decreased considerably and the new ledger will be more efficient.

In the Separations Section, activities, in addition to budget and goal preparation, included the preparation of the Section's Quarterly Savings and Improvement Report for the fourth quarter Fiscal Year 1954, the preparation of an economic justification for the project proposal on the Purex Vacuum Acid Fractionator, and the inauguration of a four digit payroll suffix to facilitate delivery of time cards and checks.

On July 29, AEC Audit verified balances carried in General Ledger Account 0510 "Fabrication Work in Progress." This consisted of checking individual work orders and verifying balances as of June 30. The last fiscal inventory of this account was conducted in January by the Manufacturing Cost Unit.

GENERAL AND PERSONNEL ACCOUNTING UNIT
MONTHLY REPORT - JULY, 1954

NARRATIVE REPORT

General Books Unit

Unexpended advances from the Atomic Energy Commission amounted to $2,144,551 at July 31, 1954, deposited as follows:

Cash in bank - Contract Accounts		
Seattle-First National Bank - Richland	$1 684 866	
Chemical Bank & Trust Company of New York	56 628	
National Bank of Commerce - Richland	353 057	
Total		$2 094 551
Cash in bank - Salary Accounts		50 000
Total Unexpended Advances at July 31, 1954		$2 144 551

Activity in the advance account during July may be summarized as follows:

Advance Account Balance, June 30, 1954	$2 942 071
Advances received from AEC during July	6 150 000
Cash receipts for July	340 109
	9 432 180
Less Disbursements during July	7 287 629
Advance Account Balance, July 31, 1954	$2 144 551

Advances of $6,425,000 were requested at the end of July to cover August expenditures and to maintain desired bank balances.

At year end, the account 0530 - Clearing Account was established to facilitate the closing of fiscal year 1954 costs. Activity in this account may be summarized as follows:

Over-accruals, reserve reductions and over-liquidations of cost credited to the Clearing Account		
Continuity of Service	($844 395)	
Excess Inventory Reserve	(245 019)	
Cost over-liquidations	(224 828)	
Miscellaneous	(2 622)	
Total		($1 316 864)
Less: Establishment of additional accruals and reserves at year end		
Pending Litigation Costs	393 788	
Spare Parts Inventory Reserve	181 328	
Miscellaneous	20 029	
Total		595 145
Net amount credited to Costs - Current Fiscal Year - Staff		($ 721 719)

As part of the fiscal year closing, all balances in reciprocal accounts between General Electric and CPFF Contractors were transferred to the Atomic Energy Commission.

A schedule detailing source and disposition of cash receipts, including payroll deductions representing payment of Accounts Receivable items, for fiscal year 1954 was completed and submitted to the Atomic Energy Commission as requested by them for consolidation in their Annual Financial Report to Washington, D.C.

As a result of the recent audit of Cash Control procedures, certain recommended practices have been put into effect while others are still under consideration.

1. The mailing of checks to the payee has been reassigned to an employee with no other check-handling responsibilities.

2. Responsibility for unused contract account checks has been transferred to Confidential Payroll.

3. Under consideration is the purchase of cash registers for the Works Cashier's Office.

4. The feasibility of microfilming checks collected for deposit is currently being investigated.

During the month of July, 198 travel and living expense reports totaling $31,450 were booked, as compared with 532 reports in June totaling $86,471. The decrease in expenses booked was principally due to holding the ledgers open until July 9, 1954, for the purpose of recording all travel and living expense incurred prior to June 30, 1954, in Fiscal Year 1954 cost. Total charges for Travel and Living Expense Variation and Conference Expenses are shown below:

	July	June
Travel and Living Expense Variation	$ 212	$ 786
Conference Expenses	245	1 477
	$ 457	$2 263

Accounts Payable Unit

Accounts Payable vouchers booked in July reflected a normal month's volume,

Preliminary arrangements have been made to transfer the control and responsibility for the Returnable Container Account from Accounts Payable to the Purchasing and Stores Section. The open balance in this account as of July 31, 1954 was $26,572.

Open contract commitments, excluding requirements contracts, amounted to $1,692,931 for the month of July of which $1,669,702 were contracts handled by Accounts Payable and $23,229 were consultant agreements reported by General Books. Disbursements relative to requirements contracts for the month of July amounted to $514,397.

Approved Modification No. 1 of Special Agreement No. G-23 has been received. It provides for redetermined price of unpurified graphite delivered by the Supplier subsequent to delivery of the first 1000 tons and accepted by General Electric. This modification further provides that delivery and acceptance of any quantity within the range of 1999 and 2000 tons shall be deemed to constitute substantial performance of the terms and conditions of the agreement.

Final invoice dated June 17, 1954 covering adjustments for redetermined prices of the final increment of 999.9903 tons in the amount of $33,060 is on hand. Final release of all claims arising out of and as required by the agreement has not been returned by the supplier. Complete shipments under the agreement aggregate 1999.9903 tons and total payments amount to $998,020.14.

Accounts Receivable

Gross accounts receivable balances decreased $10,896 during the month. Details of the decreases and increases may be summarized as follows:

Decreases:	
Sundry	$23 317
Electricity	3 647
Cost-Type Contractors	2 125
Others	387
Total Decrease	29 476
Increases:	
Kadlec Hospital	15 424
Telephone	2 189
Rent	967
Total Increase	18 580
Net Decrease	$10 896

The quarterly accounts receivable report was issued in July, showing a balance at June 30, 1954 of $314,019. Of this amount $198,742, or 63%, represented current accounts; $36,727, or 12%, accounts thirty to sixty days old; $17,149, or 6%, accounts sixty to ninety days old; and $61,401, or 19%, represented accounts over 90 days old. This latter amount includes accounts totaling $16,647 which are considered uncollectible and have subsequently been forwarded to collection agencies. The general ledger balance of $314,019 reflected an increase of $43,056, or 16%, above the balance at March 31, 1954.

Report of total billings to other Atomic Energy Commission Cost-Type Contractors was issued in July, covering excess materials, equipment, and special services furnished these contractors during the period of October, 1950 (date of first billings) through June, 1954. Total billings during this period amounted to $3,315,742. Of this amount $400,185 was billed during FY 1951, $2,075,290 during FY 1952, $691,195 during FY 1953, and $149,072 during FY 1954. Approximately 38% of total billings, $1,272,168, was made to E. I. duPont de Nemours and Company.

Personnel Accounting Unit

Auditors from the HOO-AEC, Finance Division, examined the reconciliations of payroll bank accounts in connection with their verification of fiscal year-end balances as shown on Financial Statements for FY 1954.

On July 15, 1954, the Hanford Atomic Metal Trades Council ratified acceptance of the general salary increase effective June 10, 1954. Accordingly, payment of the increase to employees represented by the HAMTC, including the retroactive portion, was made in salary checks distributed on July 23, 1954.

Special Absence Frequency Reports were furnished to Section Managers covering 385 nonexempt employees whose absence frequency for the fiscal quarter ended June 27 was three or more in the case of male employees, and four or more in the case of female employees.

In connection with the settlement in the case of Porter v. General Electric Company, one of the Firemen legal cases, each employee involved in the case was advised by letter of the amount awarded to him and the amounts which were withheld for income and social security taxes.

Federal and state payroll tax rates for HAPO, covering the second quarter of 1954, were forwarded in July to Accounting Services Division, Schenectady.

The procedure for depositing salaries of monthly paid employees in their accounts in local banks was changed in July. In the past, the salary checks of each employee who had authorized deposit of his salary was forwarded to the bank for deposit to his account. Beginning with the July salary payments, one check is forwarded to each bank covering the total of all salaries to be deposited, together with individual deposit slips indicating the amount to be deposited to each employee's account. This change will result in considerable saving of time in reconciling the monthly payroll bank account because of the elimination of approximately 1400 cancelled checks each month.

As a result of changes in internal procedures and controls in the Monthly Payroll, a reduction in man hours equivalent to one employee was effected in July, and the work load in the preparation of the monthly payroll is more evenly distributed throughout the month.

Provisional approval by HOO-AEC was received in July for reimbursement of the 1953 Company cost of the Pension Plan applicable to HAPO, pending execution

of definitive agreements between the Company and the Commission with respect to reimbursement of Pension Plan costs.

All employees of Personnel Accounting Unit attended a showing of the movie, "Here is Hanford" which was given in lieu of an employee communication meeting for July.

STATISTICS

General Books Unit

	July	June
Travel Advance Account		
Cash Advances - Beginning of Month	$62 428	$82 915
Advances During the Month	71 596	78 408
Expense Accounts Submitted	38 558 Cr.	86 784 Cr.
Cash Refunded	9 677 Cr.	12 111 Cr.
Cash Advances - End of Month	$85 789	$62 428
Outstanding Travel Advances		
Current	$76 388	$57 953
Over 30 Days	9 401	4 475
Total	$85 789	$62 428
Travel and Living Expenses		
Actual Expenses	$31 139	$82 146
Billed to Government	30 682	79 884
Balance in Variation Account at End of Month	457	-0-

Accounts Payable Unit

Accounts Payable Balance-Beginning of Month	$1 171 630	$ 576 987
Vouchers Entered During Month	3 336 660	3 687 903
Vouchers Paid During Month	3 723 684 Dr.	3 284 614 Dr.
Cash Receipts	7 968	1 332
Year End Accruals-J.E's 6115,6062,6063,6022		190 022
Reversal of Above-J.E's 7013,7039,7114,7040	190 022 Dr.	
July Accrual (Inventories) J.E. 7115	125 675	
	$ 728 227	$1 171 630
Number of Vouchers Recorded	3 982	5 189
Number of Checks Issued	2 355	2 611
Number of Freight Bills Paid	962	1 669
Amounts of Freight Bills Paid	189 296	425 483
Number of Purchase Orders Received	2 193	2 483
Amount of Purchase Orders Received	1 435 300	1 528 913

Accounts Receivable Unit

Account	Balance 6-30-54	Net Charges	Collections	Balance 7-31-54	Number of Bills Issued During Month
Hospital:					
Active	$ 86 967	$ 73 464	$ 56 988	$103 443	1 513
Collection Agency (65 Accounts)	10 786		1 052	9 734	
Sundry:					
Active	58 239	13 739	37 302	34 676	253
Collection Agency (132 Accounts) -a)	6 273	712	466	6 519	
Rent	37 919	403 070	402 761	38 228	6 899
Electricity	37 017	56 652	60 299	33 370	3 811
Telephone	33 249	55 949	53 760	35 438	6 760
Equipment sales to Facilities (1 account)	25 477		349	25 128	
Cost-Type Contractors	14 577	4 795	6 920	12 452	34
Safety Shoes	2 881	5 656	4 998	3 539	616
Loans to Employees (4 accounts)	634		38	596	
Sub-total	$314 019	$614 037	$624 933	$303 123	19 886
Reserve for Bad Debts	30 050 Cr.			30 875 Cr.	
General Ledger Balance	$283 969			$272 248	

(a- Includes all utility and rental accounts.

Personnel Accounting Unit

	Total	Monthly Payroll	Weekly Payroll
Number of Employees			
Changes During Month			
Employees on Payroll at beginning of month	8 691	2 313	6 378
Additions and transfers in	140	5	135
Removals and transfers out	(100)	(22)	(78)
Transfers from weekly to monthly payroll		8	(8)
Transfers from monthly to weekly payroll		(3)	3
Employees on Payroll at end of month	8 731	2 301	6 430

	July		June	
Overtime Payments During Month	Number	Amount	Number	Amount
Weekly-Paid Employees	6 362	$ 99 643-a)	5 308	$100 261-b)
Monthly-Paid Employees	322	25 354	341	28 677
Total	6 684	$124 997	5 649	$128 938

(a- Payments to weekly paid employees are for five week periods.
(b- Payments to weekly paid employees are for four week periods.

Number of Changes in Salary Rates and Job Classifications	July	June
Temporary changes	259	270
Retroactive changes	57	41
Normal changes	941	838
Total	1 257	1 149

Gross Payroll Paid During Month		
Engineering	$ 849 741	$ 798 682
Manufacturing	2 055 790	1 733 289
Plant Auxiliary Operations	985 620	819 002
Other	824 426	704 099
Total	$4 715 577-a)	$4 055 072-b)

(a- Payments to weekly paid employees are for five week periods.
(b- Payments to weekly paid employees are for four week periods.

Employee Benefit Plans	Number Participating		Percent Participation	
Participation in Benefit Plans at Month End	July	June	July	June
Pension Plan	7 960	7 951	97.8%	97.8%
Insurance Plans				
Personal Coverage	8 656	8 612	99.2	99.1
Dependent Coverage	6 040	5 997	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 315	4 268	49.4	49.1
Savings Plan	1 119	1 109	12.8	12.8
Both Plans	4 901	4 862	56.1	55.9

Pension Plan	July	June
Number Retired	9	4
Number who became eligible for participation	68	84
Number who applied for participation	64	79
Number who elected not to participate	3	5
Replies not received	1	-0-

Insurance Plan - Number of Claim Payments		
Employee Life Insurance	2	3
Employee Accident and Health Insurance	474	545
Dependent Accident and Health Insurance	434	487
Total	910	1 035

Good Neighbor Fund		
Number Participating	5 858	5 777
Percent of Participation	67.0%	66.5%

Suggestion Awards		
Number of Awards	138	13
Total amount of Awards	$1 990	$ 410

	July	June
Preferential Rates		
Number (eliminated) or added	(9)	(28)
Number Currently in Effect	578	587
Number of Military Allowance Payments		
Number	2	8
Number of Payroll Deductions - Other than Taxes		
Barracks Rent	10	10
Dormitory Rent	539	497
Good Neighbor Fund	9 855	9 689
Hospital	527	448
House Rent	5 055	5 052
Insurance	8 727	8 444
Pension	30 900-a)	25 200-a)
Safety Shoes	1 156	452
Savings Bonds	18 545	14 892
Trailer Space	150	144
Union Dues	1 893	1 900
Other	179	176
Total	77 536	66 904

(a- Approximate numbers.

PROPERTY ACCOUNTING SECTION
MONTHLY REPORT - JULY 1954

Plant Accounting Unit

Principal activities of the month resulted from fiscal year closings and year end reporting. Consolidated reports for all plant and equipment accounts were completed and forwarded to the Atomic Energy Commission the latter part of July.

Steps were instigated and a request for appropriation approved for the purchase of a Flexowriter, to be utilized in connection with unitization of K Area. This machine is designed to prepare a punched tape simultaneously with the typing of a unitization document. The tape subsequently will be utilized to prepare detail records, thereby saving duplicate typing.

Plans were put into effect which will provide unitization of projects concurrent with the construction or alteration of new or added facilities, direct liaison with the contact engineers and witnessing the actual construction, providing a more equitable basis for unitization procedures.

The value of plant and equipment at July 31, 1954, is summarized as follows:

	(In Thousands)		
	Asset	Reserve	Net
Completed Plant and Equipment	$736,486	($278,946)	$457,540
Construction Work in Progress	33,153		33,153
Total Cost Recorded (GE Books)	769,639	(278,946)	490,693
AEC and Other Contractor Costs			
Land and Land Rights	5,476		5,476
Construction Work in Progress	152,680		152,680
Total	$927,795	($278,946)	$648,849

A special study was started to assign a standard commodity code classification to all plant and equipment. The assignment of standard commodity code classification will generally conform to some standard set up and utilized by the AEC, in order to closely adhere to requirements of the AEC on a nation-wide basis.

Complete segregation of community items from industrial plant items was started during the month. The segregation and form of records are to conform to the requirements of the community operation and will be completed in such a manner that transfer of records and values may be made with ease.

One employee terminated and one rotational trainee was assigned on a permanent basis to the Unit. Employees at the end of July 31, 1954, totaled 36, comprising 6 exempt and 30 non-exempt.

Inventory Accounting Unit

Railroad materials in the custody of Transportation Section were physically inventoried on July 27, 1954. Results of the inventory reflected a difference of $1,759 over the reconciled book value of $39,863. Most of the overage was due to salvaging of material from retirements of the rail system and materials left over from completed work orders.

Several meetings were held with Stores Unit personnel to formulate an appropriate time schedule for taking physical inventory of general supplies. As a result of these meetings, it was agreed that the inventory would be taken in a three-day period as follows:

September 20 - Medical Supplies
September 21 - Area Stores
September 22 - Central Stores

In order for Stores to get physical inventory tags prepared for each line item (approximately 35,000) of material to be counted, tags were issued and instructions given to Stores personnel covering their preparation and control.

Work was also begun in making necessary arrangements for taking physical inventory of special materials in the custody of Manufacturing, Engineering and Radiological Sciences beginning August 23, 1954, and of Community Operations general supplies and spare parts on August 30, 1954.

Beginning with July business and each month thereafter, inventory accounts will be adjusted, by means of an accrual, to reflect a more accurate value of inventory materials on hand at month end. The accrual will be made from the open document file maintained by Inventory Accounting containing receiving reports, accounts payable vouchers and other documents which represent value of materials received but not billed, and materials billed but not received.

An instruction from the Atomic Energy Commission set forth a new procedure for handling excess construction inventories and redefined standby inventories and spare parts. Inventory schedules to be submitted to the AEC covering inventory activity for the fiscal year ended June 30 were to reflect activity based on the new definitions. Inasmuch as accurate figures were not immediately available for inclusion in the year end inventory schedules, estimated figures were developed and used.

Inventory Accounting Unit - continued

Following is a summary showing inventory account balances for the months of June and July, together with the amount of change:

	(In Thousands) Book Balance 6-30-54	7-31-54	Increase (Decrease)
Current Inventories			
General Supplies	$ 1,334	$ 1,442	$ 108
Fuel and Lubricants	71	60	(11)
Essential Materials	3,568	3,228	(340)
Total Current Inventories	4,973	4,730	(243)
Special Materials	1,424	1,421	(3)
Spare Parts	2,648	2,738	90
Excess Materials	1,359	1,317	(42)
Total Inventories - Gross	10,404	10,206	(198)
Less: Spare Parts Inventory Reserve	(662)	(662)	0
Excess Inventory Reserve	(1,087)	(1,021)	(66)
Total Reserve	(1,749)	(1,683)	(66)
Total Inventories - Net	$ 8,655	$ 8,523	$ (132)
As a Memo:			
Excess Equipment	$ 2,208	$ 2,234	$ 26
Excess Equipment Reserve	1,766	(1,738)	(28)

Decrease in gross value of inventories at July 31 from value at June 30 is due primarily to delay in renewing coal contract for fiscal year 1955.

One employee terminated during the month, reducing the total number of employees from 13 at June 30 to 12 at July 31.

Property Management Unit

An instruction has been received from the Commission redefining current use, standby and excess stores inventories and adding a new definition for spare parts. These two definitions are somewhat at variance with current HAPO practices and will require considerable reshuffling, especially in spare parts. Conferences are being held with interested management to reach decisions on how we can best comply with the directive. The Commission's letter also directs that as of July 1, 1954, excess generated by construction contractors be physically segregated from excess generated by operating contractors. This does not impose any great problem and is now being carried out.

Considerable difficulty has been experienced in proper inventory accounting for precious metals which fall under the classification of Reactor and Other Special Materials. The Financial Department is required to maintain a perpetual inventory for Reactor and Other Special Materials. The widespread use of these materials, the type of work in which they are used, and the large number of individual holders poses many practical difficulties in accounting for the material. A proposed instruction guide has been worked out with and accepted by management concerned. The promulgation of this guide should result in more effective control of these materials.

Property Management Unit - continued

Conferences have been held between interested AEC and GE personnel in connection with the program covering construction equipment to be held for future use upon completion of the closeout of the current Kaiser and Blaw-Knox construction programs. As a result of these discussions a general understanding of the types of equipment to be retained was reached and a formalized plan of procedure presented to AEC by letter dated July 20, 1954. Further action is awaiting AEC acceptance of the plan and authorization of funds.

A survey has been made of the items of equipment stored in various locations in the plant which are not in use and have not been declared excess. The equipment is presumably being held by the owners for possible future use. There is a considerable quantity of property in this category. Consultations are being held with management concerned looking toward the desirability of having this equipment stored and accounted for in a controlled warehouse under the Stores Unit.

Sixty 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 July are shown in the following list:

Hanford 4X Program

Project proposal requesting $800,000 for initiation of design and procurement of critical material and equipment for the 4X Program was submitted to the AEC July 19. Supplemental information requested by the Commission was forwarded to the Engineering and Construction Division, AEC, July 22. AEC directives have been issued as follows:

CG-597 - Hanford 4X Program, 200 and 300 Areas

July 23, $100,000 for initiation of design; July 29, $500,000 (including $100,000 previously authorized) for initiation of design and procurement.

CG-599 - Hanford 4X Program, 100 Area

July 23, $100,000 for initiation of design and procurement; July 29, $300,000 (including $100,000 previously authorized) for initiation of design and procurement.

Appropriations Unit - continued

Hanford 3X Program

Letter dated 7-2-54, D. F. Shaw to W. E. Johnson, stated the 3X Program at Hanford was restricted to Mint Production. The Commission requested GE to take the following action on project proposals connected with this program.

CG-573 - Hanford 3X Program, 300 Area

Close out project upon completion of work authorized by directive dated June 25. $860,000 has been authorized for the work requested, excluding iridite facilities for can preparation prior to hot pressing, facilities for recovery of process solution, and installation of ultrasonic bond test equipment.

CG-574 - Hanford 3X Program - Irradiation

Prepare a revised project proposal canceling all work except the procurement of a yet to be determined number of shipping containers and casks.

CG-575 - Hanford 3X Program - Extraction

Cancel all work.

CG-581 - Development Facilities

Cancel all work.

CA-187-D-III - Redox Production Facilities, Part III, Waste Water Disposal Basin

Project proposal requesting change of scope to include the installation of additional Redox waste water disposal facilities was forwarded to the AEC July 20. Directive dated July 23 authorized AEC an increase in over-all project funds from $180,000 to $310,000. Work Authority dated July 26 authorized GE an increase in funds from $101,000 to $132,000.

CA-513 - Expansion of 200 Area Facilities

Proposal requesting additional funds in the amount of $220,000 (total $1,040,000) to complete the hot semiworks conversion portion of this project was prepared for transmittal to the AEC. Prior to forwarding to the Commission, discussions between AEC and GE representatives resulted in an agreement that a revision to the over-all authorization would not be required and that GE could reallocate presently authorized funds. GE funds were reallocated by Project Authorization as follows:

Part A - Purex Facilities	$4,097,500
Part B - Metal Conversion Facilities	342,500
Part C - Purex Prototype Facilities	560,000
Part D - Hot Semi-Works Conversion	1,040,000

Appropriations Unit - continued

CG-549 - Activate Task I, RMA Line, Building 234-5

Proposal requesting $240,000 for design engineering, procurement and site preparation of the RMA Line which is located in Room 232-233 of the 234-5 Building was approved by the AEC April 29, 1953. Revised proposal requesting total funds of $500,000 for this project was approved by the AEC June 29.

CA-555 - Graphite Hot Shop and Storage Facilities - 3730 Building

Proposal requesting $93,000 (GE $16,200) was forwarded to the Commission September 23, 1953. The proposal was returned October 22 for reconsideration and possible revision. Letter dated December 11, A. B. Greninger to J. I. Thomas, re-submitted proposal without change to the Commission. Letter dated March 30, 1954, D. F. Shaw to P. D. Lee, authorized GE to proceed with a study of various alternates in lieu of the proposed Graphite Hot Shop. Design of the facility was authorized, it being understood that the most economical of the various alternates considered in the study would constitute the project. Project proposal forwarded to the AEC July 22 requested $83,500 for conversion of the 3730 Building into a graphite hot shop, GE portion $38,500.

CA-586 - First Capacity Increase - 230-KV System

Proposal requesting $1,390,000 (GE $65,000) to supplement the existing 230-KV electrical transmission system with an additional transmission line, including necessary breakers and terminal equipment, from the Bonneville Power Administration Midway Station to the Hanford Production Areas, was forwarded to the AEC June 2. Proposal was returned unapproved by the AEC July 20 requesting further consideration be given to the design of the system and to leasing instead of purchasing of the BPA facilities.

CG-587 - TBP Waste Scavenging

Design authorization requesting $10,000 for completion of a project proposal and initiation of detailed design was approved by the AEC May 26. Project proposal requesting total funds of $245,000 (plus $4,000 transferred capital property) to modify and add equipment and waste cribs in and adjacent to Building 221-U and the 241-BY Waste Storage Tank Farm to permit scavenging of long-lived fission products from the TBP Plant wastes currently being produced was forwarded to the AEC June 29, 1954. Directive dated July 8 authorized GE $200,000 (plus $4,000 transferred capital property) for this project.

CG-588 - Ammonia Scrubbers, Redox

Proposal requesting $175,000 (including $10,000 authorized for initiation of design) to provide ammonia scrubbing equipment in the Redox plant for the purpose of minimizing the emission of contaminated ammonia nitrate particles from the stack was approved by the AEC July 22, 1954.

Appropriations Unit - continued

CG-589 - Dejacketing and Ultrasonic Equipment Metal Examination Facility - 105-C

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.

CG-593 - Discharge Area Viewing Facilities - 100-B Area

Proposal requesting $35,500 for installation of a closed circuit television system to provide operating personnel with a means of viewing the discharge face of the reactor from the Control Room and the front face elevator was approved by the AEC July 16.

CG-594 - Re-roofing the 221-T Canyon Building - 200-W

Proposal requesting $23,000 for repairs to the roof deck of the 221-T Canyon Building was approved by the Commission July 21.

CA-595 - Installation of Car Pullers - 100-B, D, F and H Areas

Proposal requesting $22,000 (GE $7,000) to provide a more efficient method of spotting coal cars was forwarded to the AEC July 8. Directive dated July 23 authorized the AEC $22,000 for installation of the car pullers. Work Authority dated July 28 authorized GE $7,000.

SF ACCOUNTABILITY SECTION
MONTHLY REPORT - JULY, 1954

The revised accounting controls covering Metal Preparation Section operation indicate satisfactory performance after first month's operation. New factor weight for 8" slugs and revised calculations for charges to Process Solution, etc., resulted in excellent performance in controlling the Factor Weight Difference account.

The Normal Uranium section of the SF Accountability Manual was issued.

Standard heels established in Redox dissolvers were used in accounting records at month-end inventory. The inventory inspection was conducted on an informal basis by personnel of the Process Flow Unit.

Preparatory work was started to set up TBP and UO_3 accounting records in line with the addition of more inclusive source data.

A bias was discovered in the TBP measurement calculations of the 15-1 and 15-6 tank calibrations. Corrections almost completed by SF Measurement Methods Unit.

Data have been accumulated for the first draft of the flow sheet covering the Bismuth Phosphate Operation. Assignment should be completed in August and loaned personnel returned to permanent Units.

A table of precisions for various numbers of predicted grams of pile produced product was calculated based on the precisions of the Kinderman curve.

Measurement data from recent T Plant cleanouts were investigated in an effort to establish a method of determining the total amount of holdup at a cleanout and the relationship between buildup and throughput. A lack of data for multiple cleanouts and the cost of obtaining such data indicate that, at present, a reasonably precise estimate of product holdup cannot be obtained. However, the existing data will be examined to determine the feasibility of obtaining an estimate of month to month variation in the amount of holdup.

Investigation has begun into measurement procedures to be used by the Hot Semi-Works which will be in operation soon. Radio-assays with isotope correction factors will probably be used instead of the X-ray photometry method.

A review was made of the measurement method for computing U-235 quantities in the Redox, TBP and UO_3 plant material balances and a revised procedure written.

The method of computing precisions in 231 Building product was revised to show the change in analytical method and precision and the new can loading procedure.

Liquidation of Inactive Materials continued with an estimated equivalent value of $540,000 involved. These were reduction crucibles from Metal Fabrication facility. The material balance percentage of the product

recovered from casting and reduction crucible fragments and associated slag is approaching the figure which may be considered to be reasonable and expected.

An unusual incident took place in the Metal Fabrication building and it may take several weeks to determine the material balance on the quantitites of SF material involved.

The US AEC-HOO conducted the remaining portion of Survey #11. This involved enriched uranium, thorium and U-233. Schedules were worked out by the SF Procedures and Audit Unit and, except for one or two incidents of a minor nature the survey was most successful. Cooperation from Manufacturing and Engineering department personnel was of a very high order.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION
JULY 1954

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning of month	375	369
Additions and transfers in	15	19
Removals and transfers out	(11)	(13)
Employees at end of month	379	375
Personnel by Unit at Month-End		
General	7	7
Audits and Procedures Section		
Accounting Procedures	2	2
Administrative Planning	3	3
Internal Audit Unit	14	14
Reimbursement Accounting	3	3
	22	22
Cost and Budgets Section		
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	9	8
Medical	3	3
Plant Auxiliary Operations	17	16
Radiological Sciences and others	8	8
Manufacturing Cost Unit		
General	2	2
Analysts	10	10
Budgets and Control	15	15
Records and Reports	15	14
	128	125
General and Personnel Accounting Section		
Accounts Payable Unit	33	33
Accounts Receivable Unit	22	20
General Books Unit	17	20
Personnel Accounting Unit		
General	2	2
Confidential Payroll Records	7	7
Employee Benefit Plans and Payroll Reports	19	20
IBM Procedures	1	1
Preparation and Employee Records	31	28
	132	131

	Current Month	Prior Month
Property Accounting Section		
Appropriations Unit	5	5
Inventory Accounting Unit	12	13
Plant Accounting Unit	35	34
Property Management Unit	3	3
Work Review Committee	2	2
	57	57
SF Accountability Section		
Measurement Methods Unit	5	5
Process Flow Unit	4	4
SF Accounting Unit	3	3
SF Records and Reports Unit	15	14
	27	26
Rotational Trainees	6	7
	379	375

PLANT PROTECTION SECTION

MONTHLY REPORT - JULY 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	98	100	2 (a)	
Security and Patrol	496	491		5 (b)
Fire Protection	136	136		
Office	206	207	1 (c)	
TOTALS	938	936	3	5

NET DECREASE: 2

(a) - Administration Area Maintenance
- 3 - New Hires
- 1 - Transferred out

(b) - Security and Patrol
- 1 - New Hire
- 1 - Transferred in
- 2 - Transferred out
- 1 - Deactivated
- 4 - Terminations

(c) - Office
- 16 - New Hires
- 4 - Reactivated
- 16 - Transferred out
- 3 - Terminations

FIRE PROTECTION UNIT

There were six operations fires during the month, with a total loss of $424.00.

Five fire calls to construction areas were answered. One fire which occurred July 1, in TC-11 Building (Blaw-Knox Paint Shop) resulted in a loss in the amount of approximately $18,955. A painter was mixing Amercoat and cement with an electric agitator when a spark from the ungrounded unit ignited the mixture and quickly spread throughout the building.

Officers of the Fire Protection Unit held 13 meetings on artificial respiration which were attended by 170 operations employees. Also, four demonstrations on the use and care of the Chemox mask were held and attended by 28 operations employees.

Drills held during July

Outside drills held	122
Inside drills held	110
TOTAL	232

Fire Extinguishers

Inspected	1,884
Installed or relocated	10
Tested	775
Delivered to new locations	13
Seals broken and not reported	25
Serviced	380
Weighed	582

Gas Masks

Inspected	87
Serviced	10

OFFICE SUB-SECTION

Clerical Services Unit

Plant Mail and Addressograph

The volume of internal mail continues to increase. Postal mail remained

Types and Pieces of Mail Handled	July	June
Internal	3,594,580	3,525,188
Postal	74,781	81,951
Special	2,083	2,349
Registered	1,340	1,250
	3,672,784	3,610,738
Total postage used	$3,031.31	$3,463.03
Total teletypes handled	2,653	2,995
Total store orders handled	947	828

Addressograph	July		June	
Type of List	Number of Runs	Total Copies	Number of Runs	Total Copies
Plant name list	114	162,653	115	163,326
Housing list	28	68,326	28	83,562
Payroll list	19	40,445	11	37,235
Total new plates	3,012		1,985	
Total Corrected plates	6,152		4,365	
	9,164		6,350	

Central Printing

The work load in Central Printing during July has been exceptionally heavy. The current reprinting of Organization and Policy Guides is taxing the efforts of the Print Shop. Besides the great volume of OPG's, which were printed and waiting to be released, the following is a run down of some of the larger orders handled:

50,000 sheets - Blaw-Knox Foreman's Report
100,000 sheets - Purchase Order Terms
70,000 sheets - Blaw-Knox Daily Equipment Report
450,000 sheets - "Don't Say It-Write It" forms

Sixty printed and bound copies of the Incentive Fee Proposal were completed and delivered within twelve working hours after receipt.

Work Completed	July	June
Orders received	381	361
Orders completed	380	369
Back log	111.7	99.8
Copies printed	1,080,356	1,506,719
Negatives masked	564	870
Negatives processed	738	946
Photo copy prepared	456	182
Litho plates processed	772	1,035

Stenographic Services

Twelve new employees were assigned to the Stenographic Pool in July - two experienced stenographers and ten stenographer-typists. Sixteen transfers were effected through the month.

Assignments were completed for eighty-seven individuals against seventy-two different cost codes. Due to the greater than usual number of employees, it was possible to fill forty-five temporary assignments. Classified work was heavier than usual and required 731 hours work to complete. Productive hours of work were greater than have ever been recorded before for one month.

Breakdown of Hours	July	June
Dictation and Transcription	0	0
Machine Transcription	39	38.5
Letters	30	34
Rough Drafts	76.5	198
Dittos, Duplimats and Xerography	454.5	427.5
Miscellaneous	597.5	462
Holiday Time	144	64
Training Time	659	372.5
Absentee Time	16	13.5
Unassigned Time	109	211
Total	2,125.5	1,821
Employees on loan to other Units	2,541.5	1,520
	4,667	3,341

Plant Duplicating

On July 14, improved Xerographic equipment was installed in the Central duplicating office, 703 Building. The new unit makes it possible to obtain excellent reproductions from photographs, graphs, and large solid areas. Considerable work of this type is being processed for the Graphis Unit, A.E.C., and others.

On July 29, an office type Ozalid printer was installed in the 300 Area duplicating office. Personnel at that location were given operating and maintenance training on the following day. This equipment will be utilized to reproduce extra copies of documents issued by Classified Files.

Arrangements were made this month to have 11" x 17" size Formal Report pages machine folded in Central Printing. This work was formerly done entirely by hand in the 300 Area duplicating office. This improved method of handling pages which require folding will save time and accelerate completion of the reports involved.

Plant Duplicating Statistics	July	June
Orders Received	2,994	3,234
Orders completed	2,970	3,167
Orders on Hand	80	67
Offset plates	13,240	15,128
Offset Copies	722,226	862,222
Verifax Masters	1,204	1,447
Verifax Copies	3,247	4,493
Stencils	505	254
Stencil Copies	7,664	2,906
Ditto Masters	280	247
Ditto Copies	5,125	4,795
Zerox Plates	1,314	1,837

Records Control Unit

Quantity of records received, processed and stored:

Employee and Public Relations Department	18	Standard	Storage	Cartons
Engineering Department	62	"	"	"
Fiancial Department	124	"	"	"
Manufacturing Department	70	"	"	"
Plant Auxiliary Operations Department	77	"	"	"
Radiological Sciences Department	4	"	"	"
Sub-Contractors				
Vitro Corporation	1	"	"	"
TOTAL	356	Standard	Storage	Cartons

Persons provided records service: 617

Cartons of records destroyed: 661

Records cartons issued: 210

Percentage of Records Service Center Vault (exclusive of North Richland) occupied by records is 85.6%.

Twenty-five requests for file cabinets were received, 16 requests were filled and nine requests were cancelled. No requests are pending. Three combination locked cabinets and six key locked cabinets were picked up with no exchange and returned to stock for reissue.

Three "Requests for Authorization for Records Disposal" were returned approved by the Atomic Energy Commission. Category evaluation of Personnel Health Exposure records consisting of 82 individual records pertaining to health exposure was developed and submitted to the Radiological Sciences department for internal approval.

Uniform filing was established in one office during the month. A total of 484 offices have installed the system to date. Seven rechecks were made on established files.

Office Equipment Unit

Office Furniture

A request for additional furniture requirements for Project CA-533 (telephone exchange) was received from Project Engineering. This material requirement will be scheduled for delivery in March 1955. Plant Inventory stock will be screened prior to issuing an Appropriation Request and requisition.

During the FY 1954, a total of 725 chairs, 500 desks and 250 tables were rehabilitated by an outside contractor, at a cost of approximately $25,650. It is anticipated that our FY 1955 rehabilitating program will be reduced approximately 20%. This is based on a lesser number of wood furniture in service and no additional project requirements forecasted.

Purchase orders for additional equipment requirement for 100-K Area has been placed by AEC Procurement and new material is being furnished by GSA.

The activity in office furniture during the month was as follows:

Item	Received by Credit S.O.	Issued	Salvaged
Blackboard	0	9	1
Bookcase	0	7	2
Chair	123	129	13
Costumer	5	13	5
Card Files	8	7	3
Cabinet	27	55	6
Desk	51	34	5
Table	26	45	1
Daveno	2	10	0
Miscellaneous	61	115	12
	303	424	48

TOTAL: 775

There is a steady flow of furniture being returned from service that is placed in a salvage category which has reduced serviceable inventory stock to a minimum. The inventory value of caption 93 (expense office furniture) was $14,874 at the close of the month of June. This represents a two months supply on hand.

Office Machines

A total of 83 machines were declared excess and two new machines were received during the month. There is a balance of 487 machines carried in warehouse stock of which 248 are manual typewriters and 83 machines are carried as shop loans. New machines are being issued in exchange for older models to upgrade status of machines in service. Necessary steps are being taken to reduce inventory stock of older models.

One special request for appropriation was issued and approved to purchase one Flexowriter and special platens for an IBM installation in setting up capital equipment records.

Office Machine Repair Unit

In an effort to keep all office machines in the best operating condition, plastic covers have been purchased for all models handled and this unit is encouraging all departments to keep their machines covered when they are not in use.

New Foxboro steam flow recorder calibrated and put into operation in the Desert Inn. This meter will record water consumption of the Desert Inn.

A study was made of the water being pumped at each of Richland's five irrigation pump houses. This unit supplied and calibrated the flow recorders and also checked the orifice calculations.

One new Model 25B Selenium Rectifier with full controls was installed and put into operation for Bio-Assay Laboratory, 747 Building.

Laundries Unit

Process Laundry	June	July
Pounds Delivered	237,751	211,158
Pounds Rewashed	14,212	14,483
Total Dry Weight	251,963	225,641
Monitoring		
Poppy Check - Pieces	241,408	206,460
Scaler Check - Pieces	340,501	291,543
Total Pieces	581,909	498,003
700 Area Laundry		
Flatwork - Pounds	31,584	26,328
Rough Dry - Pounds	38,197	21,598
Total Weight	71,944	50,407
Estimated Pieces	94,246	66,033

ADMINISTRATION AREA MAINTENANCE SUB-SECTION

AEC-114 New Transportation Facilities: Scheduled completion 97%, actual completion 88%.

Main Shop Building: Wall panel and floor slab placements complete; block wall laying 98% complete; built-up roofing 80% complete; all jib cranes and hoists, with exception of paint room hoist, installed and tested; safety locks for paint room hoist were bent in transit and have been taken to Pasco for straightening (contractor's request for 120 day time extension in this area has not as yet been approved); overhead door installation complete; electrical 65% complete; all office wall framing complete; painting and spackling in main office area 20% complete; plumbing 65% complete.

Dispatcher Building: Building complete except for painting, plumbing fixgures, electrical fixtures and equipment installations.

General Area: Finish grade for blacktop 90% complete; blacktop 35% complete; fence erection in bus loading and unloading lanes complete; chain link fencing work started.

CA-561 713 Building Alterations: AEC issued notice to proceed on July 19, and construction work has started. Completion date is November 19, 1954.

CA-533 Official Telephone Exchange: Contractor's work is progressing on schedule.

IR-179 703 Basement Alterations, Fifth Wing, North: No further action taken to reactivate this proposal, following its return without approval by AEC.

-- Additional Office Space - Central Stores Warehouse; No further action taken this month on project proposal, which is in rough draft form.

A total of 145 lineal feet of movable partitioning and 11 doors were used from stock to make three minor installations in 200-W, one in 300 and four in 700 Area.

Appropriation Request for FY 1955 Hauserman requirements is in process.

Former site of 712-A Building is being leveled to grade and prepared for use for temporary parking.

Forty-four office moves were made during the month.

Contractor on Community sewer line installation north of 761-762 Buildings is continuing work of replacing signs, reseeding disturbed lawn area and replacing walks where necessary.

Traveler's Insurance representative inspected electric hot water tank in Central Stores Warehouse.

General Maintenance

Installation of 38 fluorescent light fixtures in north portion of 713-A replacing inadequate incandescent lighting was completed during the early part of this month.

Six fluorescent fixtures were installed in X-ray reception room at the hospital.

Smithcraft fluorescent light fixture installation in third wing of 703 Building is complete.

Buzzer system revisions and extensions were made in 707, 760, 761 and 762 Buildings.

Emergency circuit in 770-B was rewired; hot plugs were provided for Central Stores and Building 747; a set of time delay circuits was installed in Building 784; 110-volt circuit was provided to steam meter at Desert Inn; emergency generator was hooked up for Civil Defense, 703 Building. New three-phase power circuit and panels were installed in warehouse 13 for carpenter machines used in excessing program.

Shafting and large bearing housing were machined for irrigation pump; one set of guide spiders were bored and bushed for domestic well pump for Community Maintenance.

Locksmith opened six jammed safes for Blaw-Knox; changed and set twelve door combinations for 234-5 Building; rekeyed all locks in 326 Building. Six door closers were repaired.

Alterations were made to water still in Bio-Assay Laboratory to utilize condensate for make-up water and assist in preventing corrosion of heating coil.

Chart recording flow meter was installed on steam line to Desert Inn.

Status of boiler work: Summer inspection and overhaul - Central Stores boiler, 90% complete; No. 1 boiler 784 Power House, 90% complete; two tubes were replaced in No. 2 boiler, 784.

Bearings were replaced on main exhaust fan in attic over nurses' center at hospital. This was the first repair since installation.

Carpenter saws and scales were moved from Warehouse 15 to 13, along with excess shipping program activities.

Mid-summer replacement of dust filters and pads for coolers in 700 Area is 95% complete.

Approximately 200 lineal feet of Hauserman partition was relocated or installed in connection with rearrangement of office space in 703, 713-A and 707 Buildings. Changes to lights, ducts and radiators in connection with partition changes were coordinated.

Approximately 1,300 square feet of Mastipave floor covering was laid in new office section of Warehouse 13, for Excessing personnel.

The vacated emergency officer's room in 770-B was cleaned up, accoustical tile repaired and repainted, for use as recording room.

Approximately six yards of concrete was used in the setting of platform scales in Warehouse 13, steam meter pit at Desert Inn and miscellaneous small patch jobs.

Recovered truck bed and made new side gates for a Transportion truck.

Installed two exterior windows in 761 Building.

Thirteen offices, AEC mail room vault, and stair wells in 703 Building were repainted on cycle program.

Building Services

The janitor service program is being changed and work redistributed so that each janitor or janitress will be responsible for all work in an assigned area except for floor sealing, which is performed by floor servicemen, and window washing. This places definite responsibilities on individuals and eliminates roving miscellaneous work crews. It is anticipated that this action will improve the quality of work without increasing cost.

Steam Operation

No. 3 boiler was in operation at the beginning of the month, with Nos. 2 and 4 in reserve and No. 1 undergoing biennial major overhaul.

On July 8, No. 2 boiler was placed in service with No. 3 boiler reverting to reserve status. Change was made to accomplish repairs on west half of main powerhouse steam header.

No. 2 boiler continued in service for the remainder of the month, with Nos. 3 and 4 in reserve and No. 1 approaching completion of major overhaul.

The quantity of steam generated at the 784 plant was 2.1% greater than for the same period of the previous year.

Integrating and recording steam flow meter was placed in service at the Desert Inn on July 20.

Excessive leakage of the vitrified clay tile process sewer lines draining the 784-A water softeners, caused by breakage of several length of tile and deterioration of cemented joints, necessitated replacement of these lines with lead-caulked cast iron pipe. The access opening and crawl space resulting from this job will readily permit inspection and repair of these lines in the future.

On July 23, inspector from the Travelers Insurance Company inspected No. 3 boiler, the air receiver and the four chemical feeders at the 784 plant.

Coal consumed: 520.00 net tons (entirely from stockpile).

Steam generated:	7,404.6 M. Lbs.
Steam leaving plant:	6,147.3 M. Lbs.
Steam delivered:	4,064.1 M. Lbs.
Total water softened:	863,900 Gallons
Total soft water sent to Kadlec Hospital:	17,650 Gallons
Total soft water sent to 784 Heating Plant:	846,250 Gallons

SECURITY AND PATROL UNIT

Document Report

Number of classified documents and prints unaccounted for as of July 1: 335
(124 of the above 335 documents are chargeable to E. I. du Pont de Nemours & Company)

Number of classified documents and prints reported as unaccounted for during July: 7

Number of classified documents and prints either recovered or downgraded during July: 13
(Two of the 13 documents are chargeable to E. I. du Pont de Nemours & Company) -

Number of classified documents and prints remaining unaccounted for as of August 1, 1954: 329
(122 of the above 329 documents are chargeable to E. I. du Pont de Nemours & Company)

The Non-Technical Document Review Board held two meetings during July and reviewed a total of 52 documents and prints. Of this number -

23 had their classification retained,
10 were not within the scope of the Board,
15 were downgraded to "Official Use Only",
1 was declassified and
3 were referred to the Coordinating Organization Director.

Unaccounted for Document Status as of July 29, 1954 (General Electric Company)

Material	Classifications			Totals
	Top Secret	Secret	Confidential	
Documents	0	121	18	139
Drawing Schedules	0	2	0	2
Prints	0	55	9	64
Specifications	0	2	0	2
Tracings	0	0	0	0
TOTALS	0	180	27	207

Security Education

Five security articles appeared in the Works NEWS during the month.

There were 312 security meetings held and attended by 3,313 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 eleven meetings with an average attendance of 17 employees per meeting.

"Only the River" was shown at one meeting with 28 employees present.

"Disaster Strikes", a Civil Defense film, was shown at one meeting with 22 people present.

Security posters were posted in the plant areas and community of Richland as noted below:

450 large posters with the slogan "Sabotage Destroys" were posted;
200 of the bus size posters with the same slogan were posted in the plant busses.

200 posters with the slogan "A Man Who is Interested in his Plant is Interested in His Security" were posted in the areas. This poster was furnished by the Department of Defense, Washington, D.C.; 1,100 leaflets furnished by the Department of Defense, bearing the same slogan as the poster, were posted on all file cabinets during the month.

The two sets of "Burma Shave" type signs in the plant areas were changed on July 23. The new slogans are as follows:

No News--Is Good News--If it's--Classified--Security.

How to Spy--Find a Sap--And Bait--A Trap--Security.

GE Security Bulletin No. 85, entitled "Accountability for Classified Documents", was issued July 28, 1954.

The Technical Information Section issued a memorandum for all file custodians on June 30 entitled "We Can't Find 'Em If We Never Get 'Em."

123 employees of the General Electric Company received a "Q" Security orientation talk from either a representative of the Security Unit or a Security Patrol supervisor during the month of July 1954.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-W	300
Pat Searches	90	90	41	11	0	0	1
Escorts	8	7	7	41	1	34	55
Ambulance runs	1	4	0	1	0	0	4
Passes issued:							
One day temporary	86	21	10	11	0	34	53
Travel	0	0	0	0	0	0	53
Red Tag	185	106	65	25	0	378	75
Telephonic	0	0	0	0	0	0	9
Supervisors' Post Contacts	389	242	257	308	317	680	245
Other Security Patrol Activities (computed by hours):							300 & 700
Security File Check	161.5	227.5	147.6*	377*	450	547	1,380
Building Check	319	30			494	619	720

*In the 100-F and 100-H Areas, the Security File Check and Building Check are combined into one figure.

Arrest Report

Violation	Number of Violations	Cases Cleared
No Valid Driver's License and Faulty Equipment	1	1

Citation Tickets issued: 1
Warning Tickets issued: 35

Security Patrol Training Activities

100 Security Patrolmen received classroom instructions during the month.

141 Security Patrolmen received firearms training during the same period.

Training courses were as follows:

Safety Class	3/4 hour
Security Class	1/4 hour
Operations Class	1 hour

Security Patrol Post Changes

On July 28, the Tube Shop post, 100-H Area, was discontinued.

A temporary post for the 105-KW east door Control Room, 105-KW Area, was established for both the No. 2 and No. 3 shifts beginning July 13, 1954.

On July 23, the post for 165 and 190-KW, 100-K Area, was established on a twenty-four hour basis.

In July the Engineering Reproduction Files started compiling its thirty-day inventory lists to forward to all custodians of classified reproduction items.

Security Administration

Daily Badge Log Entries	1,826
"Q" Clearances	123
Formal "P" Clearances issued	50
"P" Approval Clearances issued	47
Category access granted	45
Category access withdrawn	45

June 29 through July 28, 1954, rephotographing program:

Number of "A" badges	56
Number of "B" badges	520
Photos for Passes	60
TOTAL	636

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DECLASSIFIED

HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING JULY 31, 1954

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT							
I. Visitors to this Works							
L. L. Ferguson General Electric Company New York, New York	Discuss salary administration plans	W. I. Patnode	7-12-54	7-16-54		X	700
II. Visits to other Installations							
D. A. Conley to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Wage and classification consultation	J. H. Julien W. D. Miller F. Raisbeck	7-13-54	7-14-54	X		
D. W. McLenegan to: Knolls Atomic Power Lab. Schenectady, New York	Engineering problems in atomic energy processes	K. R. Van Tassel	7-3-54	7-31-54	X		
B. C. Scudder to: Knolls Atomic Power Lab. Schenectady, New York	Discuss mutual industrial medical problems	P. W. Reynolds	7-22-54	7-24-54	X		
J. J. Tagen to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Wage and classification consultation	J. H. Julien W. D. Miller F. Raisbeck	7-13-54	7-14-54	X		
ENGINEERING DEPARTMENT - ENGINEERING ADMINISTRATION SECTION							
I. Visitors to this Works							
G. W. Dunlap General Engineering Laboratory Schenectady, New York	Consult on instrumentation activities	A. B. Greninger	7-7-54	7-9-54	X		300-L XXX 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
J. L. Michaelson General Engineering Laboratory Schenectady, New York	Consult on instrumentation activities	A. B. Greninger	7-7-54	7-9-54	X	300-L XXX 700	
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visits to other Installations							
H. G. Johnson to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss new separations and design and development progress	F. L. Culler	7-19-54	7-21-54	X		
H. G. Johnson to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss new separations design and development progress	L. Perry	7-21-54	7-23-54	X		
H. G. Johnson to: Knolls Atomic Power Lab. Schenectady, New York	Discuss new separations design and development progress	F. E. Crever	7-26-54	7-28-54	X		
H. G. Johnson to: Argonne National Lab. Chicago, Illinois	Discuss new separations design and development progress	S. Lawroski	7-28-54	7-30-54	X		
W. L. Pearl to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss new separations design and development progress	F. L. Culler	7-19-54	7-21-54	X		
W. L. Pearl to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss new separations design and development progress	L. Perry	7-21-54	7-23-54	X		
W. L. Pearl to: Knolls Atomic Power Lab. Schenectady, New York	Discuss new separations design and development progress	F. E. Crever	7-26-54	7-28-54	X		
W. L. Pearl to: Argonne National Lab. Chicago Illinois	Discuss new separations design and development	S. Lawroski	7-28-54	7-30-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
O. H. PIlkey to: Knolls Atomic Power Lab. Schenectady, New York	Review construction of West Milton facility	A. J. DeLong	7-27-54	7-28-54	X		
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visits to other Installations							
E. S. Churman to: Electric Boat Division General Dynamics Corporation Groton, Connecticut	Inspect materials previously purchased for HAPO	E. M. Ward	7-27-54	1-1-55	X		
R. C. Lutton to: Electric Boat Division General Dynamics Corporation Groton, Connecticut	Inspect materials previously purchased for HAPO	E. M. Ward	7-27-54	1-1-55	X		
J. W. McLaughlin to: Electric Boat Division General Dnamics Corporation Groton, Connecticut	Inspect materials previously purchased for HAPO	E. M. Ward	7-27-54	1-1-55	X		
B. J. Seaver to: Electric Boat Division General Dnamics Corporation Groton, Connecticut	Inspect materials previously purchased for HAPO	E. M. Ward	7-27-54	1-1-55	X		
ENGINEERING DEPARTMENT - TECHNICAL SECTION							
I. Visitors to this Works							
E. R. Astley General Engineering Lab. Schenectady, New York	Discuss biophysics analysis	G. E. McCullough D. W. Pearce	7-26-54	7-27-54	X		100-D 105-D 300-L 303
D. S. Billington Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss hot laboratory facilities	L. D. Turner	7-16-54	7-16-54	X		300-L XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
J. J. Droher North American Aviation Downey, California	Discuss fuel element displacement	H. L. Libby D. C. Worlton	7-12-54	7-14-54	X	300-L XXX
M. Fox Brookhaven National Lab. Upton, Long Island, New York	Discussions and observations in connection with reactor technology	R. B. Richards	7-18-54	7-24-54	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 300-L XXX
I.Kaplan Brookhaven National Lab. Upton, Long Island, New York	Discussions and observations in connection with reactor technology	R. B. Richards	7-18-54	7-24-54	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 300-L XXX
W. M. Leaders Mallinckrodt Chemical Works St. Louis, Missouri	Discuss uranium quality and fabrication	G. E. McCullough W. T. Kattner	7-26-54	7-27-54	X	100-B 105-B, 105-C 300-L 303
C. C.Miles Westinghouse Corporation Idaho Falls, Idaho	Research on sub-marine thermal reactor	R. V. Dulin	7-13-54	7-31-54	X	100-B108-B 100-H 105 300-L XXX 105-KW
R. Powell Brookhaven National Lab. Upton, Long Island, New York	Discussions and observations in connection with reactor technology	R. B. Richards	7-18-54	7-24-54	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 300-L XXX
W. E. Shaw National Lead Company Fernald, Ohio	Consultation on pulse generators	V. R. Cooper R. G. Geier F. W. Woodfield	7-26-54	7-27-54	X	300-L XXX
J. U. Shepardson Mallinckrodt Chemical Works St. Louis, Missouri	Total danger sign tests Reactivity test	W. T. Kattner	7-13-54	7-14-54	X	100-B 105-B, 105-C 300-L 303

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
T. E. Stephens North American Aviation Downey, California	Discuss fuel element displacement	H. L. Libby D. C. Worlton	7-12-54	7-14-54	X		300-L XXX
L. O. Sullivan Knolls Atomic Power Lab. Schenectady, New York	Confer on hot laboratory safety	L. D. Turner	7-14-54	7-14-54	X		300-L XXX
S. M. Tuthill Mallinckrodt Chemical Works St. Louis, Missouri	Total danger sign tests Reactivity test	W. T. Kattner	7-13-54	7-14-54	X		100-B 105-B, 105-C 300-L 303
J. C. Woodhouse E. I. du Pont de Nemours Wilmington, Delaware	Attend advisory meeting	G. E. McCullough	7-1-54	7-1-54	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 300-L 303; 700
P. C. Cohen Westinghouse Atomic Power Pittsburgh, Pennsylvania	Discuss proposal of new high pressure in-pile recirculation loop	J. A. Berberet	7-19-54	7-20-54	X		100-B 105-C 105-KW 100-H 105 700
W. J. Lindsey U. S. Atomic Energy Comm. Washington, D. C.	Neutron emission from plutonium	O. F. Hill	7-22-54	7-22-54	X		200-W 234, 235
II. Visits to other Installations							
F. W. Albaugh to: Knolls Atomic Power Lab. Schenectady, New York	Discuss personnel transfers and assistance to Hanford Program	L. L. German J. Flagg	7-8-54	7-9-54	X		
R. E. Baars to: Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile experiments and special request irradiations	E. E. Baldwin C. A. Bruch	7-20-54	7-23-54	X		
R. E. Baars to: Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile experiments and special request irradiations	E. E. Baldwin C. A. Bruch	7-26-54	7-30-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
R. L. Dickeman to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation, control, and neutron economics	H. Stuart J. B. Sampson	7-19-54	7-20-54	X		
R. L. Dickeman to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss reactor operation, control, and neutron economics	C. E. Larson	7-21-54	7-21-54	X		
R. L. Dickeman to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss reactor operation, control, and neutron economics	C. W. J. Wende A. A. Johnson	7-22-54	7-23-54	X		
T. W. Evans to: Phillips Petroleum Co. Idaho Falls, Idaho	Observe start-up of experimental apparatus at Material Test Reactor	W. B. Lewis W. B. Lewis	7-27-54 7-7-54	8-3-54 7-11-54	X X		
M. D. Freshley to: Phillips Petroleum Co. Idaho Falls, Idaho	Observe pile experimental apparatus on Material Test Reactor	W. B. Lewis	7-31-54	7-31-54	X		
G. C. Fullmer to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation, control, and neutron economics	H. Stuart J. B. Sampson	7-19-54	7-20-54	X		
G. C. Fullmer to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss reactor operation, control, and neutron economics	C. E. Larson	7-21-54	7-21-54	X		
G. C. Fullmer to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss reactor operation, control, and neutron	C. W. J. Wende A. A. Johnson	7-22-54	7-23-54	X		
J. C. Johannesen to: Phillips Petroleum Co. Idaho Falls, Idaho	Install GEH-4 Installation of GEH-4 experiment	W. B. Lewis H. J. Nertney	7-7-54 7-27-54	7-12-54 8-1-54	X X		
D. C. Kaulitz to: Phillips Petroleum Co. Idaho Falls, Idaho	Observe start-up of experimental apparatus	W. B. Lewis	7-1-54	7-11-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
L. J. Lucas to: National Lead Company Fernald, Ohio	Observe fabrication and machining of uranium	J. Ciborski	7-19-54	7-20-54	X		
L. J. Lucas to: Oak Ridge National Lab. Oak Ridge, Tennessee	Observe fabrication and machining of uranium	J. M. Case	7-21-54	7-23-54	X		
G. E. McCullough to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Metallurgical development Advisory Committee meeting	C. D. Harrington	7-12-54	7-13-54	X		
G. M. Muller to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss nuclear safety at Hanford	D. Callihan J. McLendon	7-14-54	7-16-54	X		
G. M. Muller to: Brookhaven National Lab. Upton, Long Island, New York	discuss exponential experiments and theory	J. Chernick	7-19-54	7-21-54	X		
G. M. Muller to: Knolls Atomic Power Lab. Schenectady, New York	Discuss temperature coefficients; reactor physics	J. B. Sampson	7-21-54	7-23-54	X		
P. J. Pankaskie to: Knolls Atomic Power Lab. Schenectady, New York	Discuss zirconium fabrication	D. W. White	7-12-54	7-16-54	X		
P. J. Pankaskie to: Bridgeport Brass Co. Bridgeport, Connecticut	Discuss zirconium fabrication	R. M. Treco S. French	7-15-54	7-16-54	X		
R. S. Paul to: Phillips Petroleum Co. Idaho Falls, Idaho	Install GEH-4 Technical liaison on Material Test Reactor instrumentation for Hanford experiment	W. B. Lewis R. J. Nertney	7-7-54 7-27-54	7-15-54 8-3-54	X X		
P. H. Reinker to: Knolls Atomic Power Lab. Schenectady, New York	Inspect manufacturing plants and discussion on SAR Program	- -	7-15-54	7-15-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Areas	Unclass Areas
G. E. Wade to: Phillips Petroleum Co. Idaho Falls, Idaho	Install GEH-4 experiment	W. B. Lewis W. B. Lewis R. J. Nertney	6-30-54 7-20-54	7-15-54 8-2-54	X X	
W. P. Wallace to: Knolls Atomic Power Lab. Schenectady, New York	Discuss zirconium fabrication	D. W. White	7-12-54	7-14-54	X	
W. P. Wallace to: Mass. Inst. Technology Cambridge, Massachusetts	Discuss zirconium fabrication	A. R. Kauffman	7-15-54	7-16-54	X	
W. P. Wallace to: Bridgeport Brass Co. Bridgeport, Connecticut	Discuss zirconium fabrication	R. M. Treco	7-15-54	7-16-54	X	
P. J. Pankaskie to: Mass. Inst. Technology Cambridge, Massachusetts	Discuss zirconium fabrication	A. R. Kauffman	7-15-54	7-16-54	X	
A. T. Whatley to: Phillips Petroleum Co. Idaho Falls, Idaho	Borescoping assistance to ANP staff	J. M. Frame W. B. Lewis	7-5-54	7-9-54	X	
E. C. Wood to: U. S. Atomic Energy Comm. Washington, D. C.	Obtain briefing from AEC for visit to Atomic Energy Research establishment at Harwell, England	P. McDaniel	7-1-54	7-2-54	X	
M. R. Wood to: Phillips Petroleum Co. Idaho Falls, Idaho	Install GEH-4 experiment	W. B. Lewis R. J. Nertney	6-30-54 7-27-54	7-15-54 8-3-54	X X	

FINANCIAL DEPARTMENT

I. Visits to other Installations

V. D. Donihee to: Knolls Atomic Power Lab. Schenectady, New York	SF accountability	E. F. Hennelly	7-27-54	7-28-54	X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. M. Johnson to: Knolls Atomic Power Lab. Schenectady, New York	Review financial data	W. W. Smith R. Turner	7-29-54	7-30-54	X		
W. Sale to: Knolls Atomic Power Lab. Schenectady, New York	Discuss cost transfers and man-month costs of research and development work	W. W. Smith R. Turner	7-7-54	7-7-54	X		
MANUFACTURING DEPARTMENT							
I. Visits to other Installations							
T. W.Hauff to: National Lead Company Fernald, Ohio	Preparation of materials for Hanford	J. M. Ciborski	7-20-54	7-20-54	X		
T. W. Hauff to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on radiation monitoring and nuclear safety	E. P. Lee J. F. Flagg L. L. German	7-21-54	7-21-54	X		
W. P. McCue to: Knolls Atomic Power Lab. Schenectady, New York	Discuss salary problems and organization and development at KAPL	F. Lewis E. P. Lee I. H. Dearnley	7-5-54	7-8-54	X		
A. R. Maguire to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on operation, control problems and inspection of techniques	E. P. Lee	7-20-54	7-21-54	X		
H. T. Wells, Jr. to: General Engineering Lab. Schenectady, New York	Discuss engineering and power problems	J. L. Michaelson E. P. Lee M. Davis	7-29-54	7-30-54	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
C. J. Briscoe Oak Ridge National Lab. Oak Ridge, Tennessee	Instruction on radiation monitoring	A. J. Stevens	7-1-54	three months	X		100-B 105-B,105-C 100-D 105 100-F 105; 100-H 105 200-E XXX; 221-T- 231, Redox, 200-W 300-L XXX, 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
G. W. Dunlap General Engineering Lab. Schenectady, New York	Discuss particle detection instrumentation	F. E. Adley P. L.Eisenacher	7-9-54	7-9-54	X		
M. E. Ensminger Washington State College Pullman, Washington	Consult with animal farm personnel	L. K. Bustad	7-7-54	7-7-54	X		100-F 108
A. E. Gorman U. S. Atomic Energy Commission Washington, D. C.	Review sanitary engineering matters and status of river contamination	J. W. Healy R. E. Rostenbach	7-12-54	7-12-54	X		300 XXX
J. L. Michaelson General Engineering Lab. Schenectady, New York	Discuss particle detection instrumentation	F. E. Adley P. L. Eisenacher	7-9-54	7-9-54	X		
M. L. Smith Oak Ridge National Lab. Oak Ridge, Tennessee	Instruction on radiation monitoring	A.J. Stevens	7-1-54	three months	X		100-B 105-B, 105-C 100-D 105 100-F 105; 100-H105 200-E XXX; 221-T, 231, Redox, 221-U- 200-W; 300-L XXX;700
J. W. Taylor Oak Ridge National Lab. Oak Ridge, Tennessee	Instruction on radiation monitoring	A. J. Stevens	7-1-54	three months	X		100-B 105-B, 105-C 100-D 105 100-F 105; 100-H105 200-E XXX; 221-T, 231, Redox, 221-U- 200-W; 300-L XXX;700

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SPECIAL STUDIES SECTION

I. Visits to other Installations

W. K. MacCready to: General Electric Co. Schenectady, New York	Attend management conference	F. K. McCune B. R. Prentice	7-26-54	8-5-54	X		
K. L. Robertson to: U. S. Atomic Energy Comm. Washington, D. C.	Attend management conference	E. J. Bloch L. R. Hafstead	7-26-54	8-5-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
W. K. MacCready to: U. S. Atomic Energy Comm. Washington, D. C.	Attend management conference	E. J. Bloch L. F. Hafstead	7-26-54	8-5-54	X		
K. L. Robertson to: General Electric Co. Schenectady, New York	Attend management conference	E. K. McCune B. R. Prentice	7-26-54	8-5-54	X		

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PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY JULY 1954

STATISTICAL AND GENERAL

Awards have been made on our requirements for Steam Coal covering fiscal years 1955, 56, and 57. Savings realized by means of the three-year contract period, coupled with reduced Section 22 freight rates granted to the Government by the railroads, aggregate approximately $1,250,000 or approximately $416,000 per year. The railroads have indicated to the Government that the special rates will be protected over the entire three-year period, thus assuring our supply at very favorable cost.

Recent contract award on CO_2 requirements, made to Cascade Fire Equipment Corporation, culminates a search for better sources of supply for this material and better prices. Two years ago this material was purchased in tank truck quantities at $127 per ton. This price has come down, first to $100 per ton, and finally on this latest award, to $86.33 per ton. This indicates a total reduction in cost on equivalent quantities of approximately $48,000.

Purchase order HWC 5147 on the Aluminum Company of America covers special extrusions for the horizontal rods required on the CG-558 program. Although the vendor made the prototype they have been unable to produce a satisfactory extrusion on this order. Accordingly, in cooperation with the vendor and the Engineering Department, efforts are continuing to solve the problem.

Successful negotiations were completed with the rail carriers for a reduction in the freight rate on liquid Sodium Bichromate from Painesville, Ohio to the Project. The savings in freight charges will amount to approximately $11,270.00 on the current contract.

The United Air Lines has installed a toll-free line between Richland and Pendleton which we may use, eliminating the necessity of long distance calls for airline reservations. It is estimated that this service will effect a savings of approximately $225.00 per year.

Close contact is being maintained with A.E.C. in order to promote the successful disposal of surplus by the planned auction sale tentatively scheduled for October 11, 1954. During the month a meeting was held with A.E.C. to expedite financial relief of the General Ledger and Stores' records in this connection.

A further reduction of back orders (Store Orders) was accomplished during July with 336 on hand as of July 30, 1954, compared with 412 on hand as of June 25, 1954. Of the 336 back orders, 35 were for stainless steel.

Definite schedules for physical inventory of General Supplies were established and will be accomplished as follows:

Medical Supplies	- September 20, 1954
Area Stores	- September 21, 1954
Central Stores	- September 22, 1954

This will necessitate a two day shut-down for Central and Area Stores. The field will be notified sufficiently in advance to obviate unnecessary hardships because of the close-down.

PURCHASING AND STORES SECTION
SUMMARY

During July material and equipment valued at $ 23,540 were withdrawn from the Excess Accounts for use on the Project.

Organization and Personnel	6-30-54	7-31-54	Change
Employees on Roll	293	293	0

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
JULY 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.

JULY 1954 Cost Category	Government Agency	Small Business	Big Business	Educational and Other
$0 - $ 24.99	$ 13.50	$ 4,070.09	$ 1,677.79	$ 14.45
$25 - $ 499.99	405.00	125,716.63	57,462.64	210.85
$500 - $ 24,999.00	1,400.00	367,803.79	322,515.77	-
$25,000 - $ Up	-	86,620.00	438,928.00	-
	$ 1,818.50	$ 584,210.51	$820,584.20	$ 225.30
Number of Actions	6	1485	717	4

Vendor Contacts	232
Claims Processed	0
Damage Reports Processed	4
Over & Short Reports Processed	3
Accounts Payable Requests Handled	212
Difference Slips Processed	56
Clearance Slips & Purchase Order Change Approvals	341
Material Exception Reports	290
Return Orders Issued	198

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

	Items Processed	Items Received	* Value of Items Rec'd.	** Cost of Items Rec'd.	Savings to H.A.P.O.
	149	2	$ 1,252.49	$ 494.88	$ 757.61
Previous Balance	2,273	432	$12,480.17	$5,065.59	$7,414.58
Combined Totals	2,422	434	$13,732.66	$5,560.47	$8,172.19

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

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT

	G	D	Total
Requisitions on hand 7-1-54			
Operations Procurement	818		818
Construction Procurement		256	256
A.E.C. Procurement	219	76	295
Total	1037	332	1369
Requisitions Assigned during July			
Operations Procurement	1748		1748
Construction Procurement		492	492
A.E.C. Procurement	344	61	405
Total	2092	553	2645
Requisitions Placed during July			
Operations Procurement	1817		1817
Construction Procurement		578	578
A.E.C. Procurement	402	89	491
Total	2219	667	2886
Requisitions on hand 7-31-54			
Operations Procurement	749		749
Construction Procurement		170	170
A.E.C. Procurement	161	48	209
Total	910	218	1128

Purchase Orders Placed	HW	HWC	Total
Operations Procurement	1513		1513
Essential Material	28		28
Construction Procurement		545	545
Local Purchase	11	2	13
Total	1552	547	2099

Value of Orders Placed			
Operations Procurement	$ 519,972.85	$	$ 519,972.85
Essential Material	449,390.41		449,390.41
Construction Procurement		461,343.29	461,343.29
Local Purchase	138.28	22.68	160.96
Total	$ 969,501.54	$ 461,365.97	$ 1,430,867.51

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	43	28	8	79
Essential Material	7	2	1	10
HWC Construction	23	3	9	40
Total	73	38	18	129

Value of Alterations Issued	Increase	No Change	Total
HW Operations	$ 9,390.77	$ 39,661.04	$ 49,051.81
Essential Material	30,203.17	5,785.91	35,989.08
HWC Construction	12,251.38	26,201.88	38,453.26
Total	$51,845.32	$ 71,648.83	$123,494.15

Government Transfers	OR	ORC
	3	0

Organization and Personnel	6-30-54	7-31-54	Change
Employees on Roll	23	21	-2

12:5:75

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
JULY, 1954

On HWC 1108 the Byron Jackson Co. furnished twelve 1500 HP vertical motors and pumps for the K-Area River Pump House. The motors were furnished with Kingsbury type thrust bearings. Failures have occured on two of these thrust bearings necessitating a visit by factory engineers to see if they could arrive at the cause of the failure. Replacement bearings have been furnished and installed.

The facilities to be provided by Project CG-587, TBP Waste Scavenging, are scheduled for use September 15, 1954 to assure continuity of operation of the 221-U Building. The Engineering Department has requested that every effort be made to have material on the plant by August 31, 1954. The expediting is being done on a project basis.

Purchase Order HWC-5147 on the Aluminum Co. of America covers special extrusions for the new type horizontal rods to be installed on the CG-558 program. Although the Aluminum Co. of America previously made the prototype they have been unable to produce a satisfactory extrusion on this order. Thirty-five extrusions have been made to date, none have been accepted by our Inspection Department. We are making continuous contact with the Aluminum Co. of America and Engineering Deparement on the matter of obtaining satisfactory extrusions.

We have received a copy of Mr. J. M. Heffner's letter of July 7, 1954, that a Stores operation will be assumed by Minor Construction about August 1, 1954. Minor Construction Stores operation is contemplated in a warehouse adjacent to the existing warehouse at White Bluffs.

The following figures depict the work load trend of this Unit:

1954

	Mar.	Apr.	May	June	4 Month Average	July	% Change
Requisitions assigned	475	550	549	599	543	492	-9
Requisitions placed	486	488	556	587	529	578	9
Requisitions on hand	189	251	244	256	235	170	-28
Purchase Orders Expedited (Ave.)	-	-	-	791	-	654	-

Organization and Personnel	6-30-54	7-31-54	Change
Employees on Roll	24	27	+ 3

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
JULY -- 1954

Statistical and General

Awards have been made on our requirements for Steam Coal covering fiscal years 1955, 56, and 57. Savings realized by means of the three-year contract period, coupled with reduced Section 22 freight rates granted to the Government by the railroads, aggregate approximately $1,250,000 or approximately $416,000 per year. The railroads have indicated to the Government that the special rates will be protected over the entire three-year period, thus assuring our supply at very favorable cost.

Recent contract award on CO_2 requirements, made to Cascade Fire Equipment Corporation, culminates a search for better sources of supply for this material and better prices. Two years ago this material was purchased in tank truck quantities at $127 per ton. This price has come down, first to $100 per ton, and finally on this latest award, to $86.33 per ton. This indicates a total reduction in cost on equivalent quantities of approximately $48,000.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate - with the Commission for signature. This supplemental contract will not be approved by the Commission until the supplemental contract for Nitric Acid with the same company has been negotiated and presented to the Commission.

2. Liquid Carbon Dioxide - award made, contract being negotiated.

3. Steam Coal - awards made, contracts being prepared for submission to the vendors for signature.

Organization and Personnel

	6-30-54	7-31-54	Change
Employees on Roll	34	36	+ 2

PURCHASING AND STORES SECTION
STORES UNIT
JULY 1954

STATISTICAL AND GENERAL

A meeting was held 7-11-54 with representatives of Minor Construction and Metal Preparation to discuss the Spare Parts program for the new 300 Area Process facilities. It was determined that Minor Construction had not purchased any parts as Operational Spares for these facilities and therefor, the responsibility for having spares available at start-up time rested with the Manufacturing Department. Properly authorized Stock Adjustment requests will be processed through the Spare Parts unit for the required material. Because of the short time available before start-up, we agreed to expedite procurement of the necessary parts.

The memorandum dated 7-2-54 from K. D. Nichols of the Washington Office of the AEC on the subject of Budgeting, Accounting, and reporting of Inventory Transactions resulted in our making a quick review to determine how our inventories would be affected. On the basis of our own interpretation and application of the various commodity groups as outlined, it was determined that parts and materials valued at approximately $150,000, should be transferred and included in either a Standby or Current Use Inventory. However, no action has been taken to date to complete such a transfer.

Preliminary meetings were held with representatives from the Transportation Section and Radiological Sciences Department to discuss the procedure to be followed in moving the contaminated equipment from the Ice House in White Bluffs to the 101 Building at Hanford.

Close contact is being maintained with A.E.C. in order to promote the successful disposal of surplus by the planned auction sale tentatively scheduled for October 11, 1954. During the month a meeting was held with A.E.C to expedite financial relief of the General Ledger and Stores' records in this connection.

Detail of all properties in a surplus category was assembled for A.E.C. and their subsequent transmittal to the auctioneer firm which will conduct the sale.

A further reduction of back orders (Store Orders) was accomplished during July with 336 on hand as of July 30, 1954, compared with 412 on hand as of June 25, 1954. Of the 336 back orders, 35 were for stainless steel.

Definite schedules for physical inventory of General Supplies were established and will be accomplished as follows:

Medical Supplies	- September 20, 1954
Area Stores	- September 21, 1954
Central Stores	- September 22, 1954

This will necessitate a two day shut-down for Central and Area Stores. The field will be notified sufficiently in advance to obviate unnecessary hardships because of the close-down.

The stationery caption has been completely changed to the new commodity classification listing and catalogues have been distributed to the field as of July 19, 1954.

PURCHASING AND STORES SECTION
STORES UNIT
JULY 1954

Bins and pallet racks necessary to properly warehouse spare parts in the 2101 Building were requisitioned during the month and it is expected that they will be received and installed during early September so that the physical inventory of spare parts can be accomplished shortly thereafter.

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

Disbursements by store order	$ 23,135
Transfers to inventories	$ 405
Offsite shipments	$227,907
Receipts	$229,505

Organization and Personnel	6-30-54	7-31-54	Change
Employees on Roll	199	196	- 3

PURCHASING & STORES SECTION

TRAFFIC UNIT

July, 1954

STATISTICAL AND GENERAL

Successful negotiations were completed with the rail carriers for a reduction in the freight rate on liquid Sodium Bichromate from Painesville, Ohio to the Project. The savings in freight charges will amount to approximately $11,270.00 on the current contract.

The United Air Lines has installed a toll-free line between Richland and Pendleton which we may use, eliminating the necessity of long distance calls for airline reservations. It is estimated that this service will effect a savings of approximately $225.00 per year.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of July amounting to $3,529.06. This makes a total savings from September 1, 1946 to date of $1,770,988.22.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for July, 1954	Savings from 9-1-46 thru July, 1954	Savings from 9-1-46 to date
Aluminum Sulphate (liquid)	Portland, Ore.	$702.31		
Extrusions, Aluminum (T/L)	Edgewater, N.J.	740.44		
Machinery (T/L)	San Francisc, Cal.	72.88		
Machinery (T/L)	Los Angeles, Cal.	413.82		
Sodium Bichromate	Painesville, Ohio	658.73		
Sulfamic Acid	Grasselli, N.J.	940.88		
		$3,529.06	$1,767,459.16	$1,770,988.22
2. Freight Bill Audit		2,760.58	124,487.29	127,247.87
3. Loss and Damage & Overcharge Claims		223.48	138,359.46	138,582.94
4. Ticket Refund Claims		627.93	40,106.95	40,734.88
5. Household Goods Claims		00.00	17,641.85	17,641.85
		$7,141.05	$2,088,054.71	$2,095,195.76

Work Volume Report

Completed Travel Requests	112

PURCHASING & STORES SECTION
TRAFFIC UNIT
JULY, 1954

Work Volume Report (cont.)

Reservations resulting from above:	Rail	58
	Air	131
	Hotel	154
Expense Accounts Checked		227
Household Goods & Automobiles	Movements Arranged Inbound	2
	Movements Arranged Outbound	3
	Insurance Riders Issued	1
Ticket Refund Claims	Filed	3
	Collected - Number	10
	Collected - Amount	$627.93
Freight Claims	Filed	5
	Collected - Number	5
	Collected - Amount	$223.48
	Over & Shorts Processed	15
	Damage Reports Processed	7
Freight Bill Audit Savings		$2,760.58
Freight Shipments Traced		36
Quotations	Freight Rates	152
	Routes	193
Bills Approved	Air Freight	1
	Air Express	16
	Boat	1
	Carloading	163
	Express	128
	Rail	243
	Truck	276
Carload Shipments	Inbound	243
	Outbound	7

Report of Carloads Received

Commodity	CMSTP&P	NP	UP	TOTAL
Acetic Acid		1		1
Aluminum Sulphate (liquid)	2	1	3	6
Aluminum Sulphate (dry)		3	3	6

PURCHASING & STORES SECTION
TRAFFIC UNIT
July, 1954

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	TOTAL
Asphalt	1	7		8
Bichromate of Soda	1			1
Building Paper		1		1
Caustic Soda	22	12	29	63
Chlorine	1	2	2	5
Coal	25		62	87
Cotton Garments			1	1
Furnace Parts	1			1
Lime		1	1	2
Limerock			1	1
Machinery			3	3
Methyl Isobutyl Ketone	1	1		2
Naphtha		1	1	2
Nitrate of Soda	1			1
Nitric Acid		11	17	28
Oxalic Acid	1			1
Phosphoric Acid		3		3
Salt		1		1
Silicate of Soda	1	1	2	4
Soda Ash	2	2	2	6
Steel Containers		1		1
Steel Plates			1	1
Sulfamic Acid	1			1
Sulphuric Acid	1			1
Transformer Oil			1	1
Merchandise & Stop Cars	2		2	4
Total	63	49	131	243

Organization & Personnel	6-30-54	7-31-54	Change
Employees on Roll	9	9	0

[redacted] DECLASSIFIED

TRANSPORTATION SECTION
MONTHLY REPORT
July 1954

Transportation Section personnel forces increased from 491 to 492 by four new hires, one transfer in, two reactivations - personal illness, two terminations, three transfers out, and one deactivation - personal illness.

Construction of the new Consolidated Transportation Facility progressed from 76% on June 25 to 88% on July 23. A tentative completion date of October 1 is anticipated with possible partial occupancy about September 15.

Prepared a report of economy achievements during FY 1954 by the Transportation Section. Furnished data to the Internal Audit Unit to substantiate the savings of $30,676.84 in FY 1954 and $111,368.60 to be realized in subsequent years.

Furnished informational data as to costs, volume statistics, and operating practices of the Transportation Section to Welcome Retz of the auditing staff from Schenectady, New York. Mr. Retz was assisted by the Internal Audit Unit and the review was in progress from June 25 through July 13.

Furnished informational data as to costs and operating practices for railroad process service to R. T. Jaske of the Engineering Department. Mr. Jaske is making a special study of the over-all problem in view of the substantial increase in forecasted production.

Completed the recast of Transportation Section budgeted funds for FY 1955 and FY 1956 to the revised organizational units.

Prepared Transportation Section estimated personnel requirements for FY 1955 in accordance with the revised key assumptions. Furnished a subsequent report as to personnel on roll at 6/30/54 and anticipated additions thereafter to be used in the establishment of control ceilings.

Transportation Section gross costs for FY 1954 totaled $4,055,711 or 4.49% under the budget. Salaries and continuity of service were responsible for 56.67% of the budget underrun with material and miscellaneous overhead costs or services accounting for the remaining 43.33%.

Developed Transportation Section unit cost performance bogeys for FY 1955. Furnished accompanying narrative and statistical data with respect to cost and volume estimates for each function as explanatory supporting detail.

Made an analysis of probable railroad costs for FY 1955 resulting in an increase in handling rates per process car from $155 to $210. This represents a per car cost increase of approximately 35% compared to a per car volume increase of about 125% from the heavy loading program and the newly modified well cars.

Revised applied equipment rates for the Road Maintenance Unit to reflect the increase of 25% in truck rentals.

Prepared a report on the revised program for disposal of surplus and salvage property as to the potential reduction in operating costs by the Road Maintenance Unit.

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Transportation Section

Representatives of the Inventory Accounting Unit and the Transportation Section completed the physical inventory of railroad materials (0410-85) on July 27 and 28 as scheduled. The tentative reconciliation indicates an overage of $1759.

A representative of the Transportation Section attended a meeting at Central Stores on July 15 with personnel of the Inventory Accounting Unit, Property Management Unit, and the Stores Unit, to discuss the physical inventory program for the remainder of calendar year 1954 and proposed changes in budgeting, accounting, and reporting of inventory transactions as contained in an A.E.C. memorandum dated July 2, 1954 from K. D. Nichols.

Completed the servicing of the 110 new 1954 model Chevrolet sedans. All units have been assigned to operating departments on a replacement basis. Fifty Pontiac sedans have been transferred to the A.E.C. Equipment Pool and the remaining 60 replaced units are being prepared for excess.

The decontamination center in the 200-West Area was in operation throughout the month and 40 units of HC equipment were released by the Radiation Monitoring Sub-Section. Work is being performed on work orders from the Manufacturing Department by Transportation Section personnel under special work permit conditions.

Railroad carloads of commercial materials during July decreased by 1264 cars or 53.83% under June due to a cessation of coal shipments caused by the annual coal miners' holiday, plus some delay in placing renewal contracts. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Co.	382	19	21	419
A.E.C.	35	0	0	38
A.E.C. Kaiser (cement)	26	0	0	22
Blaw-Knox	18	0	0	19
Bumstead & Woolford	0	0	0	1
J. P. Head	2	0	0	2
Kaiser Engineers	9	0	0	10
Sound Construction Co.	2	0	0	2
Thorne & Marble	1	0	0	1
U. S. Army	32	0	0	23
	507	19	21	537

Railroad process service during July required 434 overtime hours. Process cars totaled 77 or a reduction of 28.7% under June due to the full time utilization of the newly modified larger capacity well cars and a shutdown of the Redox Facility during the early part of the month.

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Transportation Section

Total car movements including process service totaled 1,361 in July compared to 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.

Locomotives 39-3731 and 39-3732 were removed from service for major repairs during the period of reduced activity. This work consisted of reconditioning the traction motors on 39-3731 and removing the wheels from 39-3732 for turning at the Northern Pacific Shops in Auburn, Washington.

A field service representative from the Apparatus Division of the General Electric Company met with Transportation Section personnel on June 30 to discuss the problem of traction motor brush breakage on Alco locomotives and to organize a series of tests for determining the underlying cause of the breakage. It has been agreed to conduct the requested periodic tests and to forward the results to their engineers for further study. A number of new brushes of two types has been furnished for use in these tests.

Restored trackage, severely damaged by an army bulldozer, on the main line near the U.S. Army Signal Corps camp between the 100-D and 100-K Areas. Work was performed on an emergency call-in basis on Saturday, July 17, at an approximate cost of $210.

The Plant Bus System transported 8.11% fewer passengers in July than in June. The following statistics indicate the magnitude of service rendered:

Passenger volume	128,706
Revenue - bus fares	$ 6,435.28
Earnings - transit advertising (June)	$ 102.01
Bus trips	6,620
Bus miles - passenger carrying	187,564
Passenger miles	4,346,779

The Richland Bus System transported 19.71% fewer passengers in July than in June. The marked decrease in passenger volume is largely seasonal and compares with a decrease of 17% in July 1953. The following statistics indicate the volume of service rendered:

Total passengers including transfers	7,054
Revenue - bus fares	$ 515.63
Earnings - transit advertising (June)	$ 4.64
Bus trips	1,155
Bus miles - passenger carrying	6,121
Passenger miles	23,100

Off-Plant chauffeured automobile trips (Company business and/or official visitors)totaled 105 which were rendered to the following locations as indicated:

Transportation Section

Benton City, Washington	11
Grandview, Washington	7
Hinkle, Oregon	9
Kennewick, Washington	9
Mabton, Washington	1
McNary Dam, Washington	2
Pasco, Washington	42
Pendleton, Oregon	9
Prosser, Washington	1
Spokane, Washington	1
Sunnyside, Washington	6
West Richland, Washington	2
Yakima, Washington	5

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

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	33,725	22,135	9,200	2,292	391
Received during month	113,832	19,400	30,400	850	0
Dispensed during month	116,612	16,845	30,600	915	78
Stock at end of month	30,945	24,690	9,000	2,227	313

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

Motor Overhauls	41
Class A Inspections and Repairs	105
Class B Inspections and Lubrications	1,162
Monthly Inspections - Railroad Rolling Stock	12
Semi-monthly Inspections - Buses	137
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	42
Other Routine Maintenance Repairs and Service Calls	1,808
Accident Repairs and Paint Jobs	45
Tire Repairs	535
Wash Jobs	434
	4,321

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

Code	Type	No. of Units	Total Mileage
1A	Sedans	446	639,955
1B	Buses	98	238,308
1C	Pickup Trucks	460	288,424
1D	Panel,Carryall,Sta.Wagon	154	168,311
1E	Armored Car	1	162
1G	Jeeps	2	560
68 Series	Trucks	222	90,634
		1,383	1,426,354

Transportation Section

Completed the demolition and cleanup of a hutment site south of the 703 Building. This involved the breaking of a concrete slab and the removal of approximately 1,000 cubic yards of material.

Completed the application of a non-skid single seal coat on 18.6 miles of Plant roads on the 100-C cutoff, Route 11-A, and the 100-F Area requiring 3,000 cubic yards of mineral aggregate and 67,000 gallons of asphaltic material, and 943 man-hours.

Maintenance of primary roads required 264 man-hours; walkways, parking facilities, and related ground maintenance in the Manufacturing Areas required 114 man-hours.

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

	MC 3	MC 5
Stock at start of month	74.38	79.46
Received during month	0	194.14
Used during month	56.5	273.60
Stock at end of month	17.88	0

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

	3/4" to 0 Pre-mix Tons	½" to 0 Pre-mix Tons	5/8" Chips Cu.yd.	1/4" Chips Cu.yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	74	188.5	3,574	3,836	2,226
Made during month	658	415	485	0	0
Used during month	154	62	2,806	793	422
Stock at end of month	578	541.5	1,253	3,043	1,804

TELEPHONE SECTION
MONTHLY REPORT FOR JULY 1954

GENERAL

Separation of Plant and Commercial telephone operations was effected during the month except that suitable new accounts were not available for July use. Appropriate new accounts were recommended to the General Cost Unit and will be available for August operations.

Fiscal Year 1955 operating, equipment and construction budgets were reviewed with General Cost Unit and revised as necessary.

Construction schedules for the 100KBC and official exchanges were reviewed with representatives of the AEC and the GE Engineering Department with the result that the 100KBC exchange is now scheduled to be completed and placed in service on April 16, 1955 and the Richland Official exchange is scheduled to be placed in service April 29, 1955. These schedules of course, are tentative and are contingent upon the adherence to present schedules by the equipment contractors.

AEC approval was requested for having the Hanford Works Official telephone directory printed by the General Telephone Directory Company, present publisher of the Richland directory, but no response has yet been received from the Commission.

Discussed with the Chief, Records and Services Branch of the AEC the possibility of General Electric Telephone Section being credited each month with the telephone revenue collected by the Commission from the General Telephone Company. The basis for this action is that Telephone Section operating expense includes all cost incurred in earning the AEC collected revenue. Initial AEC reaction was favorable but the matter will have to be followed up with AEC Financial people.

The craft employees of the Plant and Commercial Telephone Units, except those on vacation, were interviewed in connection with the selection of candidates to be considered for promotion to Telephone Foreman to replace P. R. Baldinger who resigned effective July 31, 1954.

Construction of the Official Telephone Exchange building by the Lewis A. Hopkins Company of Pasco was started on July 2, and good progress was made during the month.

Conferred with Schauss and Bloomstrand of Plant Accounting regarding their planned adoption of the Federal Communications Commission uniform system of accounts for telephone companies. Complete and effective use of the above mentioned system of accounts will require a field inventory and appraisal of the total value of the various units of property. The Telephone Section will cooperate as required in making the transition if there is a final decision to do so.

A special one-week study of leased line calls to Pasco and Kennewick was made at the request of the General Audit Unit.

[redacted]

PLANT TELEPHONE OPERATIONS

Plant Telephone operations during the month were very stable with a net increase of only 7 subscribers.

The installation of a PBX switchboard to serve the Central Stores Unit was started during the month and is expected to be placed in service during the early part of August. This PBX switchboard system will replace all telephones presently utilized by the Stores Unit in the 3000 area and will greatly improve their telephone service.

Telephone Section representatives conferred with representatives of the C. T. Main Company and GE Field Engineering Unit relative to Telephone Section exceptions to the telephone room in the new 1720K building.

Telephone Section personnel conferred with Central Stores Warehousing representatives on ways to improve storage and record keeping of lead sheath telephone cable held for the Telephone Section. Agreement was reached on an improved method and Central Stores will issue a work order to the Telephone Section to cover the cost of identifying all existing cable held in Standby Stock.

J. F. Lester of the Plant Telephone Unit conferred with W. Spillman of AEC and a Mr. Adams of the Kellogg Switchboard and Supply Company regarding exceptions to full acceptance of the 4-position manual switchboard installed several months ago to serve 100K construction requirements.

L. S. Howard met with Mr. Greenberg of the Vitro Corporation and Mr. Falk of GE Plant Engineering Sub-Section to discuss communication wiring plans for the 202A building (Purex Plant) 200E area.

Examined and commented on 51 Official Exchange circuit drawings submitted by the Stromberg-Carlson Company for AEC approval.

Located and repaired several cable defects.

Installed several hundred feet of new open wire circuit in the 200W area to extend reliable dial telephone service to the 241 TXR Tank Farm area.

Assisted the Foothill Electric Company in planning the installation of a temporary tie cable between the present manual switchboard and the telephone room in the 1720K building. The temporary cable will be used to provide service temporarily for 100K area operations until the new 100KBC dial exchange is installed.

Prepared a detailed specification for a standard telephone turret suitable for use in all area Patrol headquarters communication rooms and requested Purchasing Unit to obtain quotations from various telephone manufacturers.

Provided temporary dial telephone service from the 100B area exchange to the 165KW building (Electrical Sub-Station).

COMMERCIAL TELEPHONE OPERATIONS

There was a net loss of 29 residential and business subscribers during the month.

A new edition of the Richland Telephone Directory was delivered to subscribers during the first half of the month.

Prepared and issued drawings and necessary specifications for 8 miscellaneous distribution cable changes and additions.

L. H. Reagan reviewed with the Richland Wire Chief the functions of the Wire Chief position and made certain changes in procedure to increase his efficiency and effectiveness as a dispatcher of the Telephone installer repairmen.

Began job of modifying selector switches in the Richland exchange to provide lock up on exposure to a grounded subscriber line instead of repeatedly operating and releasing as at present.

Made several cable repairs to restore defective conductors to service.

Investigated a report of accidental operation of air raid sirens believed to have been caused by telephone circuit trouble. Telephone circuits were found to be clear of fault.

Inspected Yakima River aerial cable crossing for condition of towers, guys, lighting, etc.

Total operating expense for July is not yet available but is not expected to exceed the expense for June which was $15,845. Likewise, revenue figures for July are not yet available but gross revenue for the month should be somewhat higher because of a $5155 payment received from General Telephone Directory Company.

RADIO SYSTEM

Radio maintenance and installation activities for the month were unusually heavy because of the necessity for removing mobile radio sets from old cars and re-installing the sets in new cars.

Preliminary work was started in connection with the preparation of a project proposal to replace all radio equipment on the Plant now operating at 3.65 megacycles.

G. R. McKinney conferred with representatives of Security Patrol and General Electric Design and Construction organizations regarding the desired arrangement of radio equipment in the 100K area Patrol headquarters and furnished to the Engineering Department a description of a suitable antenna supporting tower to be furnished and installed by Construction.

Furnished Minor Projects Sub-Section an estimate of the cost of relocating the 300 area Patrol headquarters radio equipment from the 3707A building to building 3706. Future location of the Patrol headquarters will be in the latter building.

Only 2 fixed station service outages occurred during the month.

RADIO SYSTEM (Continued)

Staples conferred with Kaveckis of Manufacturing Plant Engineering Section regarding plans for determining the proper types of public address equipment and most effective use of same in the auditoriums of local schools and theatres occasionally utilized by the Company for employee meetings.

OVERTIME

		Exempt		Non-Exempt
Total Manhours Budgeted		16		236
Emergency Maintenance	Performed	8		16.1
Emergency Shift Coverage				16.0
Planned Telephone Moves				16.0
Planned Radio Work		8		30.5
Planned Telephone Maintenance				32.0
		16		110.6
	TOTAL		126.6	

Non-exempt overtime for the month was less than expected because there were fewer Saturday telephone moves and less emergency maintenance than anticipated.

ABSENTEEISM

	Mandays		
	Exempt		Non-Exempt
Scheduled to Work	252		1365
Absent Due to Personal Illness	1		18.6
Absent for All Other Reasons			6.3
	1		24.9
TOTAL ABSENCE		25.9	

Percent Female Absenteeism	2%
Percent Male Absenteeism	1.44%
Percent Total Absenteeism	1.6%

PERSONNEL

	Exempt	Non-Exempt
General Unit	1	1
Radio Unit	1	4
Plant Telephone Unit	5	25
Commercial Telephone Unit	3	15
Business Office	1	5
Operations Unit*	1	15
	12	65
TOTAL		77

P. R. Baldinger, Telephone Foreman, terminated July 31, 1954 by voluntary resignation.

Patricia Burns was promoted from General Clerk "C" to Stenographer, effective July 9, 1954.

STATISTICAL DATA

	At 20th of July	Change from Previous Month	Change from Year Ago
Residential Subscribers	6063	-26	+429
Business Subscribers	484	- 3	+ 15
Paystation Telephones	68	0	+ 6
Official Subscribers:			
Richland Exchange	999	- 2	+ 31
North Richland Exchange	262	- 5	- 33
Process Area Exchanges	1828	+18	+292

New Service Requests Received During the Month:

For Residential Service	89
For Business Service	13
TOTAL	102

Backlog of Service Requests:		TOTAL
For New Residential Telephones	227	
For New Business Telephones	3	230
For Residential Outside Moves	27	
For Business Outside Moves	1	28

Service Orders Processed:

In Connection with Residential and Business Service		328
In Connection with Official Service		410
	TOTAL	738

Facilities - Installed, In Service and Available:

	Exchange Lines			Party Lines
	Installed	In Service	Available	Available
Richland	4050	3990	60	329
North Richland	600	517	83	58
Process Areas	2050	1739	311	--
TOTAL	6700	6246	454	387

Radio Stations:

	At 20th of July	Change from Previous Month	Change from Year Ago
Fixed Stations	27	0	+ 9
Mobile Stations	150	- 1	+ 6
TOTAL	177	- 1	+15

E. S. Staples
Manager,
TELEPHONE SECTION

ES Staples:pab

[redacted]

August 3, 1954

ELECTRICAL UTILITY SECTION

MONTHLY REPORT

July, 1954

GENERAL

The Section's total work force of eighty-seven (87) on July 1 was reduced to eighty-six (86) at month's end due to an employee transfer.

Plant electrical peak for July:

Date	Demand KW	June Comparative KW Demand
7-30-54 (10:00 a.m.-10:30 a.m.)	113,000	116,767

Overtime hours during the month were 1.57% of scheduled time. Of this amount, .31% was instigated by customers' service requests.

MAINTENANCE AND OPERATION

The old 66 KV line from the 3000 Area substation to the Hanford substation, approximately nineteen miles, has been isolated from active facilities by GE forces preparatory to dismantlement by an off plant salvage contractor.

Partial failure of supporting elements on the carrier wave trap adjacent to OCE 322 in 151-B-C substation necessitated a change out with a spare.

On July 14, 1954, trouble on the Montana Power system caused a frequency swing to 59.63 cycles. On July 15, 1954, a switching operation at McNary surged the system. No production loss resulted.

On July 19, a grass fire southeast of Route 1 and 4 intersection burned a 66 KV line pole sufficiently as to require emergency repair. Loss amounted to approximately $150.00. Temporary Construction power to 100-K was not affected.

[redacted]

Je-1

[redacted]

SYSTEM EXPANSION AND PLANNING

In a meeting conducted by BPA officials at Walla Walla, July 2[illegible], Southeast district customers were told the present BPA power rates would prevail for at least two more years.

Jumper connections at both east and west 230 KV tap stations for 100-K Areas were installed on July 21.

Preliminary inspection of the 151-KW substation revealed the need for extensive corrective work on the 230 KV disconnect switch and bus work. Following its completion, initial energization of the west line and portions of the KW substation was made without incident at 3:21 p.m. on August 2. No loads will be assumed until several tests are satisfactorily completed.

O. Mageehon
ELECTRICAL UTILITY SECTION

O Mageehon:nlg

[redacted]

Je-2

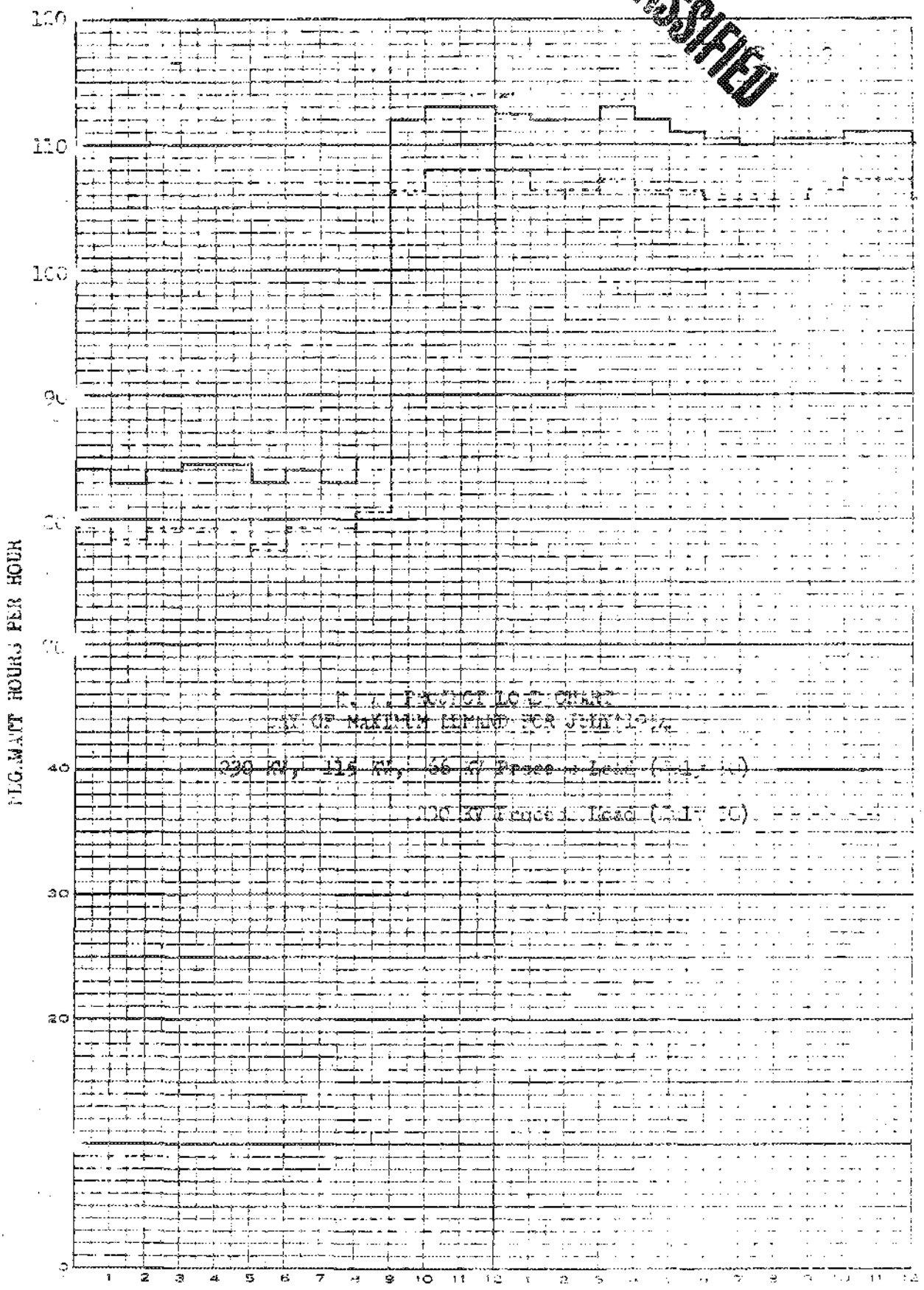
12|5|94

[redacted]

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

	ENERGY - MW HRS.		MAXIMUM DEMAND-KW		LOAD FACTOR-%	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	28120	28720	47600	48700	82.0	79.3
A-4 Out (100-D)	16260	16160	25200	24700	89.6	87.9
A-5 Out (100-H)	9950	10760	14600	16200	94.7	89.3
A-6 Out (100-F)	8340	8960	12600	12700	91.9	94.8
A-8 Out (200 Area)	5420	5350	9100	9200	82.8	78.2
TOTAL OUT	68090	69930	109100**	111500**	86.7	84.3
MIDWAY IN	68481	70523	107200*	108000*	88.7	87.8
115 KV System						
BB1-S3		1647		3195		69.3
B1-S4 Out (W. Rich.)	1459		3110		65.1	
B1-S5	151		734		28.6	
Richland	7688	7758	15680*	16000*	68.1	65.2
BB3-S4 Out (300 Area)	1808	1824	3440*	3440*	73.0	71.3
TOTAL OUT	11106	11229	22964**	22635**	67.2	66.7
Benton In	11300		29200*		53.7	
So. Richland In	60		7200*		11.6	
TOTAL IN	11360		36400**		43.3	
66 KV System						
B9-S11 Out (100-K)	1596	1650	3120	3000	71.1	73.9
B7-S10 Out (W. Bluffs)	369	303	1125	990	45.5	41.1
Hanford Out	31	28	300**	300**	14.3	12.5
TOTAL OUT	***1996	***1981(1)	4545**	4290**	61.0	62.1
HANFORD IN	2457	2375	12800*	11000*(2)	26.7	29.0
Project Total						
230 KV Out	68090	69930	109100**	111500**	86.7	84.3
115 KV Out	11106	11229	22964**	22635**	67.2	66.7
66 KV Out	1996	1981	4545**	4290**	61.0	62.1
TOTAL OUT	81192	83160	136609**	138425**	82.5	80.7
230KV In	68481	70523	107200*	108000*	88.7	87.8
115 KV In	****11360	11229	36400**	22635**	43.3	66.7
66 KV In	2457	2375	12800**	11000**	26.7	29.0
TOTAL IN	82298	84127	156400	141635	73.1	79.8

* Denotes Coincidental Demand Average Power Factor - 230 KV System 90.0
** Denotes Non-Coincidental Demand
*** Not adjusted for 100-K test power
**** Discontinuance of readings by BPA will make it necessary to [illegible] figure to obtain comparative project total.
(1) Includes 368 MWH of "K" Test Power
(2) Includes approximately 7200 KW of "K" Test Power Demand



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PLANT AUXILIARY OPERATIONS DEPARTMENT
OPERATIONS ANALYSIS SECTION

MONTHLY REPORT - JULY, 1954

Personnel Statistics

Following is the month end summary of personnel:

Operations Analysis Section

	As of 6-30-54			As of 7-31-54			Net Change		
Unit	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Tot
General	1	1	2	1	1	2	0	0	0
Applied Mathematics	18	4	22	18	5	23	0	+1	+1
Computing	6	47	53	6	43	49	0	-4	-4
Graphics	1	10	11	1	14	15	0	+4	+4
Procedures	12	3	15	12	2	14	0	-1	-1
TOTAL	38	65	103	38	65	103	0	0	0

Applied Mathematics Unit

	As of 6-30-54			As of 7-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	To
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	
Numerical Analysis	7	2	9	7	3*	10	0	+1	
TOTAL	18	4	22	18	5	23	0	+1	

* One rotational trainee.

L. Blue, a technical graduate on rotational training program, took an assignment with the Numerical Analysis Function beginning July 2.

[redacted]

Computing Unit

	As of 6-30-54			As of 7-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
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	21	22	1	18	19	0	-3	-3
Machine Processing	3	21	24	3	20	23	0	-1	-1
TOTAL	6	47	53	6	43	49	0	-4	-4

Two key punch operators were transferred to the Financial Department effective 7-12-54. One key punch operator and one tabulating machine operator were transferred to the Graphics Unit during the month.

Graphics Unit

	As of 6-30-54			As of 7-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	2	3	1	1	2	0	-1	-1
Illustrators	0	7	7	0	11	11	0	+4	+4
Graphic Designers	0	1	1	0	2	2	0	+1	+1
TOTAL	1	10	11	1	14	15	0	4	4

Two graphic illustrators were hired during the month, and two graphic illustrators were transferred from the Computing Unit. One graphic designer was transferred from the Engineering Department retro to 6-28-54. One general clerk went on a pregnancy leave effective 7-30-54.

Procedures Unit

	As of 6-30-54			As of 7-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	1	2	0	0	0
Clerical	0	2	2	0	1	1	0	-1	-1
Operations Analysts	11	0	11	11	0	11	0	0	0
TOTAL	12	3	15	12	2	14	0	-1	-1

One general clerk was placed on an illness leave of absence as of 7-1-54.

FOR THE MANUFACTURING DEPARTMENT

A new mathematical production scheduling model has been developed that includes 100, 200, and 300 area operations. This new model is presently being evaluated to determine its computational suitability. Further discussions have been held with Manufacturing personnel and arrangements have been completed to work on a test case.

There are two major difficulties to be overcome in the mathematics associated with the Hanford Production Scheduling problem. One of these is the problem created by the magnitude of the model as presently formulated. This enormity arises because of the large number of time periods over which the present model is defined. This diffuculty can be partially overcome in either of two ways: 1) The entire scope of the problem may be reduced by shortening the total time interval over which the problem is defined; or 2) an iterative technique which consists of the repeated solution of many overlaping problems each of which covers a much shorter time interval may be employed. It is realized that the latter approach may yield only an approximate solution. Studies will be conducted to determine the degree of accuracy of such a procedure.

The second difficulty arises from the nonlinear character of the model. Methods found in the literature for handling nonlinear programs have been investigated and can be shown to be inadequate. An attempt is being made to revise one of these techniques so it will be applicable to the Hanford problem. A preliminary survey is being made of the recently devised more powerful methods of dynamic functional programming to determine their applicability to the present problem.

In an attempt to establish the optimum orifice pattern for D-reactor, an analysis is presently being made of the reactor's past and present operating characteristics. The analysis includes the calculation of individual tube powers, and the comparison of these powers with the average power of the four surrounding tubes. Using procedures developed earlier in connection with the operating limits problem, two temperature and pressure maps from D-reactor were processed. These results will be combined with earlier results to form a composite picture of the reactor's past operation. In this manner it will be possible to establish a satisfactory orifice pattern for use when the reactor is reorificed in the near future.

A machine procedure for the preparation of weekly panellit gauge status reports has been completed. Using this procedure, two reports have been issued on data received from B-reactor, three on data from D--reactor, and three on data from C--reactor. These reports show the present status of every panellit gauge in the pile. Provision is made for noting on these reports any changes made on gauges during the week. Because of timing consideration it was necessary to arrange for special courier service in transmitting the data and reports. A procedure has also been developed for making a frequency distribution of gauge bases over the entire reactor, or any zone thereof. These reports will be used in implementing more efficient control of reactor operation at higher power levels.

A meeting was held with Methods Improvement Laboratory personnel of the Separation Section concerning the AEC request for a tolerance statement on the proportion of finished shapes which have a given percentage of plutonium or 1 more. In the meeting it was brought out that there exists an appreciable measurement error for the available methods of determining the amount of plutonium present in addition to a variation in the true percentage plutonium from shape to shape. As a result, it may be necessary to modify existing statistical techniques to fit this situation. Another meeting to discuss this situation is scheduled for the near future.

A working arrangement has been established with supervision in the Reactor Section to assist with the standardization of the various forms used in the 105 buildings. In addition to the form design and organization, the classification problems are being reviewed and workable procedures are being established.

Graphics is preparing illustrated studies on heat losses in boiler furnaces for Plant Engineering. This project presented a difficult problem in delineation and required a considerable amount of liaison between the industrial engineers and the illustrators. Detailed sketches of the engineer's studies were made on gradation, segregation, aggregate distribution, coal trajectory patterns, air and smoke patterns, and causes of incomplete combustion. The approved sketches were finally combined into four basic illustrations and one flow chart and are now being prepared for reproduction.

Work on the Redox Model has been temporarily slowed down because "As Built" drawings on the column piping in the Silo were not available. All columns and supports have been fabricated and are ready for installation. Drawings are due immediately and a new completion date of August 25, 1954 has been scheduled.

A flow chart of the overall Purex process was prepared for the Separations Section and will be used in a training manual together with other material now being prepared by Graphics.

Other Graphics services for the Manufacturing Department included posting of current data and publishing the department "C" Charts; preparation of a cost record table form; and making revisions to various visual aid charts.

For the Manufacturing Department 3 routine IBM reports and 2 non-routine jobs were completed for a total of 5 IBM service requests.

FOR THE ENGINEERING DEPARTMENT

Much effort has been expended in various attempts to improve the quality of the reactor fuel element. To coordinate the statistical and mathematical effort in this direction, the Reactor Fuel Element Operations Research Program was initiated. The first objective of this program was to recommend uniform testing procedures to be used on a plant-wide basis, such recommendations being based on the results of a thorough investigation of the statistical

distribution theory applicable to the problem. This has been done and a progress report is currently being prepared setting forth the theory with its resulting recommendations.

As a result of some difficulties experienced during irradiation of 25 M material, the Engineering Department requested that a comparison of Hanford recast uranium metal and that cast at Mallinckrodt Chemical Works be made for both chemical composition and density. The results of the study were reported to the Uranium Development Group as requested.

A tabulation was made of the chemical analyses of Mallinckrodt metal in connection with a certain production test. Elements of interest included iron, nitrogen, magnesium, carbon, and silicon.

The sample sizes necessary to detect a given difference between the means of three populations were determined for several combinations of 1) the probability of concluding that there are differences when in reality there are not, and 2) the probability of concluding that there are no differences when in reality there are. The recommended sample sizes were furnished the Uranium Development Group.

At the request of the Coating and Corrosion Group, a great deal of experimental corrosion data had been fitted by somewhat complicated exponential type curves, the particular form of the curves having a theoretical basis. The data were of such nature that, by appropriate transformations, it was possible to obtain an adequate fit by fitting simple quadratic curves. To expedite this work IBM tabulation panels have been designed for listing the data in a variety of forms. Further work is proceeding along this line.

Further analyses of the results of Production Test 519 were performed for the Pile Coolant Group. The purpose of the analyses was to determine whether or not the corrosion rate varies significantly with time. This will be pursued further as more data become available.

Although Zirconium has some desirable properties which may make it useful as an alloy for process tubes, it has the undesirable property of growth, i.e. Zircoloy will expand over a period of time at constant temperatures. Most metals expand only as the temperature is raised. Since process tubes have to meet close tolerances, it is important to determine the amount of growth over time at various temperatures. Growth data were collected at seven different temperatures. Seven regressions were fit in order to determine the relationship between temperature and growth and to estimate the constants of a known relationship. The analyses were conducted for and reported to the Applied Research Sub-Section.

The daily processing of data from the single column experiment at C-reactor began on July 1. Punched tape from the recording instruments at the reactor are transmitted by special courier to the Computing Unit. These tapes are then processed and a daily report issued. This report presently consists of a listing of the data recorded by the two independent recorders, and the difference in corresponding data points from the two recorders. The daily procedure involves converting punched

tape containing on the average of 36,000 digits of coded data to punched cards, converting the coded-data into numerical data by means of calibration formulas, and listing the numerical data. This procedure requires about three hours of machine time. The data obtained during the actual production time for this project has been and is being constantly monitored to determine when there is evidence of need for recalibration and to determine the best method for compiling the exposure of the column. Evidence exists at the present time that recalibration should be done at the earliest possible opportunity on one of the temperature sensing devices. A recommendation to this effect has been made. Two additional flowmeter calibration curves were fitted during the month for use in this experiment.

An extensive tabulation of steam properties has been requested. The quantities to be tabulated are the enthalpy and specific volume of saturated liquid and saturated water vapor for pressures from 300 to 1000 pounds per square inch. In addition, the same quantities are to be tabulated for liquid-vapor mixtures of quality from 0 to 1. Empirical curves are being used to compute enthalpy and specific volume. These were derived earlier in connection with the problem of water quality and pressure drop along a process tube. The curve fits for the earlier problem were intended to apply for pressures up to 500 pounds per square inch; however, it was found that, with one exception, the curves apply equally well up to the new upper limit of 1000. A new curve fit was derived for the exceptional case. The table will consist of some 35,000 entries, and require some fifty hours of calculator time for completion.

At the request of the Experimental Physics Unit of the Pile Technology Sub-Section, a Bessel function was fitted to a set of observed average relative reactivities obtained from four separate readings on each of thirteen pins placed in an irradiated slug. Before the fit was made the averages were weighted by the distance of the pin from the center of the slug. The area under the resulting curve is the first moment of the relative reactivity curve. An assumption was made (and at least intuitively shown to be correct) that all errors except the experimental error were of negligible proportions. Error in the first moment was found by obtaining the area under the curve defined by the differences between the observed points and the theoretical points. A report was issued in which the answer to this specific problem, the techniques used in the solution, and a step by step computational procedure to be followed in the solution of similar problems were given. (Letter: "Error in the First Moment" to M. V. Davis)

New equations expressing the unsteady state temperature distribution in a Hanford slug have been received and are being programmed for solution. The first part of the problem consists of finding roots of a transcendental equation of the type commonly encountered in boundary-value problems. The calculations are being performed on the card-programmed-calculator.

Work is continuing on the tabulation of first-collision density function. These functions are used extensively in the transport theory approach to neutron diffusion, and when completed, will afford a powerful new tool for calculating a number of reactor parameters which have previously been obtained by unsatisfactorily approximate methods. The preparation of these tables requires a large number of numerical integrations,

involving Bessel functions, and repeated application of previously computed results. The accuracy of the tables is being thoroughly checked by taking first through sixth differences of the table entries. A number of errors have been caught and corrected by this method.

The solution of Wilkin's integral equation obtained last month was shown to be in error. A thorough check of the computational procedure and results was made, with particular attention placed on steps where serious loss of significance might have taken place. The conclusion reached was that the computational procedure was a sound one in theory, but not adequate in view of the extreme range of numbers encountered in the intermediate calculations. Because of the inability to represent numbers more precisely in the floating decimal notation, the problem as presently phrased is not possible of solution. Fortunately, an alternative phrasing of the problem is possible, which will effectively reduce the range of intermediate quantities to the point where the computer can handle them. Investigations along this line are presently being made.

The standard approach for computing product formation as a function of exposure, while adequate for use on high-speed computing machinery, is generally too cumbersome for desk-calculator or slide rule computation. Furthermore, the standard approach, which consists essentially of evaluating the solutions to a set of simultaneous linear first-order differential equations, yields concentrations, or densities, of isotopes. Thus, it is useless in situations where the flux varies from time to time, or from one part of the full assembly to another. Several alternative approaches have been investigated. In one of these, the flux, as it appears in the solutions to the differential equations, is regarded as a function of space and time, and an attempt is made to integrate the solutions to obtain an expression for the total product formulation under given conditions. The resulting integrals, however, cannot be performed analytically. Evaluating the integrals, numerically has the disadvantage of again being too unwieldy. A third possibility, and perhaps the most straight forward, shows more promise: the isotope density is expressed as a simple power series in flux and time, whose coefficients are determined by fitting the series to points calculated by the standard method. Once coefficients have been obtained, it is a simple matter to compute product formation under the most general conditions of flux variability. To test this approach, a nine-parameter function has been chosen, and is being fit to some seventy points by the method of least-squares. The largest computational problem encountered so far is the solution of a nine-by-nine set of simultaneous linear algebraic equations. An attempt is being made to solve this system by techniques developed earlier in connection with the solution of certain integral equations.

Calculation of coefficients used in the determination of product formation in a slug has been undertaken. This particular method of determining product formation takes into account the flux variation across the tube. The coefficients have been expressed in terms of an integral, which will be evaluated numerically. Two cases are to be run.

Additional computational work has been requested on the problem of time averages of isotope ratios as a function of exposure. This problem continues to be of primary interest in the attempt to determine the optimum exposure of uranium in a reactor.

Further calculations were carried out in the determination of isotope build-up in the uranium-jacketed thorium slug. After the inclusion of several new features in the computational scheme, curves of isotope concentrations and associated quantities vs. exposure were run out, for four values of specific tube power. As a check on the above results, the same quantities were calculated on a slightly different basis, using a constant value for the flux throughout the exposure period. A comparison of the two sets of results is presently being made. From this comparison it will be possible to determine the usefulness of the more refined method, in which the flux is continuously adjusted to take account of changing isotope concentrations during the exposure period.

Certain computational difficulties have arisen in the analysis of the data connected with the experiment designed to investigate the variables affecting buckling. This experiment was run by the Exponential Physics Group. It is thought that the approximations involved may be responsible for these difficulties, and investigations continue in an attempt to refine such approximations.

Further analysis of attitude survey data for the Project Section has been completed. A separate report was prepared for each Sub-Section, containing results pertinent to the attitudes of employees in the various personnel classes within that Sub-Section. A summary of all comments employees wrote on their questionnaires was included in each report. (Letters: "Attitude Survey Results - Separations Projects Sub-Section", to G. C. Gabler; "Attitude Survey Results- Minor Projects Sub-Section", to J. M. Keffner; "Attitude Survey Results - Reactor Projects Sub-Section", to J. R. Kelly; "Attitude Survey Results - Project Auxiliaries Sub-Section", to J. W. Brands)

Routine computational work for the Engineering Department consisted of Special Request Exposure calculations for July, and Power and Exposure Studies calculations for March and April and May.

The conversion of Classified Files holding records from a manual system to a punched-card system was made during the period between June 23rd and 29th. This conversion consisted of three phases: 1) certain pieces of IBM equipment, the File Record Card File, the Receipt File and some 500,000 punched accountability cards were transported to the Chief Joseph Junior High School on June 22nd and arranged for a production-line operation. That evening the production line was primed so that the entire 50 people of the Classified File were in full production in less than one hour on the first day; 2) during June 23rd thru 26th from the receipt files approximately 70,000 of the 500,000 IBM cards were selected, checked and the chargee's name and payroll number punched into them; 3) on the 26th the IBM cards and machines were transported back to the 700 Area where the cards were processed to summarize total plant controls and man-number controls. On the 29th a set of 70,000 cards were delivered to the Classified Files which represented documents in the custody of individuals.

The daily processing of the transmittal of classified documents was begun on June 28 covering transactions since June 23rd. The processing was on a current basis after the first week. Included in the daily processing was the preparation of inventory lists for persons who were terminating.

The status of the conversion of Classified Files records to a punched card system is as follows: Holdings of individuals are completed except for consultants and sub-contractors; balancing lists of Offsite Documents are 80% done; all outgoing receipts and certificates of destruction have been key punched; and a computational method for the automatic assigning of control numbers to offsite documents has been designed.

Because of the routine nature of the conversion of Classified Files at Chief Joseph School it was decided to provide background music during the working hours on a trial basis. The purpose of the music was to alleviate the tension and fatigue and thus improve the quality of work produced. Arrangements were made with the Audio Visual Unit to provide two and one half hours of various types of music and the equipment necessary to present the recordings. Classical, modern, old standards, and semi-classical pieces were interspersed so that the rhythm and mood was continually changing. The music was played every-other hour throughout the day. A survey taken of all employees at the end of the conversion indicated that 98% preferred the music and that approximately the same percent liked the arrangements that were used.

Graphics services for Applied Research included preparation of five plates for document HW-20063 titled "Concentration and Decontamination of Pu Process Solutions by Ion Exchange"; preparation of five chart and photo plates titled as follows: 1) Density Brick Pile, 2) Scintillation Counter, 3) Electrical Resistency, 4) Cell "B" Radio Met., 5) Remote Rockwell Hardness Testor, and completion of eight figures including illustrations, charts and photo retouching for document HW-30781 titled "Fiberglass Air Filters for Hot Laboratories."

Graphics services for Pile Technology included preparation of seven slide plates for a representative of Pile Materials to use on an off-site lecture; preparation of nine detailed charts for document HW-31824 titled "100 Area Process Improvement Program"; preparation of one schematic diagram and three charts for a report on Machinability to be used in an off-site publication; preparation of photo copy for document HW-31578 titled "Apparatus for Determining Machinability of Various Graphites"; preparation of four plates for document HW-31928 titled "Surface Area - Oxidation Relationship of Graphite"; and preparation of twenty-five charts and schematic illustrations for document HW-31813 titled "Process Tube Distortion Measurements."

Graphics continued development of a series of perspective illustrations of the 100-C Area Examination Facilities for Fuel Technology. The illustrations detail the working parts of each piece of equipment with cut-away techniques applied where specified.

Work continued in the development of equipment illustration for the Purex Project Unit. Illustrations of the "Sampler" and the "Evaporator" were completed, reproduced and distributed.

Four non-routine jobs were completed for the Engineering Department by IBM.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

A sampling plan for auditing the certification of classified document inventory holdings was developed in connection with the new procedure for processing classified document records. (Letter: "Sample Audit of Document Inventory Certifications," to E. W. Sutherland)

Work has been resumed on the construction of a preliminary mathematical model for use in estimating the optimum purchase quantity and reorder point.

A study is being made of the receiving function in Central Stores. The holding time of material by receiving has been considerably reduced since the previous study in 1952. At the present time 83 per cent of the material is out of receiving in one day and 94 per cent is out within two days. This is compared with 23 per cent in 1952. Of the six per cent not cleared by receiving in two days, the majority of the orders are exceptions such as unidentified, damaged, over or short, no purchase order or government requisition, or not as specified.

A series of samples of operating information have been taken from the area bus dispatch records for the period June, 1953 thru June, 1954. These samples included information as to the number of employees, bus operators and vehicles operating between the various plant areas during 24 hour periods. The sample periods covered weekdays, holidays, Saturdays and Sundays and included samples from representative seasons of the year. The information has been tabulated for evaluation. These data are the basis for functional and economic evaluation of the area bus system. They will also be used to determine the methods to be used in evaluating the overall plant transportation system. Preliminary analyses of vehicle utilization of the Reactor and Technical Sections personnal in the 100 areas have been initiated in conjunction with this program. The data have been processed so that it is possible to compute the probabilities of having vehicles available for use at the various stations within the areas for different times of the day. Since mid-morning and mid-afternoon have been found to be the periods of maximum utilization, only these critical times will be studied for determining the number of vehicles which should be assigned to the various locations. The probabilities of having vehicles available for use can be estimated if the number of vehicles assigned to a location is changed. By deciding what proportion of the time vehicles should be available during maximum utilization periods, it is possible to estimate the number of vehicles required at each location.

Some work was done to provide an objective means of choosing the optimum number of leased telephone lines to be used by the plant. A transcendental equation was solved for the probability that the waiting time associated with leased line calls to each of several destinations would exceed a certain maximum tolerable waiting time. Considerable additional computational work must be done to evaluate the cost functions which have been derived in an effort to obtain an optimal solution.

The preliminary investigation into the problem of predicting the expected life of power poles on the plant has been completed and recommendations have been made

concerning the kinds of data which need to be collected in order to obtain the desired estimates and to predict average life remaining for various populations of poles. ("Pole Life Study - Transmission and Distribution Systems," to O. Mageehon)

In anticipation of earning a safety award an IBM system had been previously developed covering the selection, purchase, distribution and accountability of awards. As the award was won the first two phases of selection and purchase were successfully accomplished.

For the Plant Auxiliary Operations Department 14 routine IBM machine reports and 2 non-routine jobs were completed for a total of 16 IBM service requests.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

One of the inherent and basic difficulties encountered in a mathematical description of the turbulent diffusion of a river contaminant has been partially overcome. The difficulty was that of expressing a mathematical model in terms of variables which are as independent as possible of the shape of the river's channel. This means the variable should be independent not only of varying river cross sections, but also of the river's path across the terrain.

At the suggestion of Radiological Sciences Department personnel, a theory has been devised employing a variable ϕ, called "fraction of total river flow." It has been found from actual measurements made in the Columbia river that this variable is much less sensitive to cross-sectional dimensions and seasonal variations than a conventional distance measurement. Obviously, this variable assumes only values from 0 to 1, and hence in a certain sense serves to normalize a flowing river into a standard shape and size. In order to make the theory applicable to the Columbia river, work is now beginning on a velocity-profile curve fit, and the tabulation of some specific Bessel Functions of fractional order which are needed for the purpose of computing numerical answers.

Further discussions have been held with personnel of the Experimental Meteorology group in connection with the problem of analyzing data from the proposed wind turbulence meter. It is apparent that the method of analysis used will depend largely upon the type of calculating equipment available. The problem requires the evaluation of "moving averages" over some 360,000 observations. If the presently available computing equipment is used to carry out the analysis, it will be necessary to selectively sample the data in order to keep calculating time within justifiable limits.

Blood analyses were obtained for sheep fed high levels of radioactive iodine, I^{131}, since 1951. Three groups were each fed a different dosage level and a control group was included in the study. Analyses were performed to determine if there were any significant trends over time for creatinine, protein bound iodine, and white blood counts in the four groups. In addition, the times of the first indication of significant blood damage were estimated and comparisons of the effects of the different dosage levels were made. The work was done at

the request of the Biology Section. (Letter: "Blood Analyses of Sheep Fed I^{131}, Groups 6, 7, 8, and 24," to P. L. Heckett)

Analyses are currently being conducted on data giving the relative iodine content of the thyroids of ewes and their offsprings which have been fed various amounts of radioactive iodine, I^{131}. The data have been collected over a period of four years by the Biology Section. Twenty-four different groups of sheep are being studied. Ten different dosage levels of I^{131} were fed daily to the sheep. Dosage, time, and ewe-offspring effects are being estimated. Thyroid damage is important since this gland has considerable effect on bodily functions, especially growth.

Following the issuance of a report on the existing procedures of operation of the Exposure Records Unit, a meeting was held with personnel of that Unit to discuss the possibility of converting portions of the procedures to machine techniques. At the present time it appears that the film badge program is well adapted to such a conversion. The pencil-meter program, however, will require the development of an automatic recording minometer before machine processing becomes economically feasible. Study is presently being made of a machine procedure which will afford an extensive summarization and analysis of exposure data, involving a minimum of procedural change.

Routine computational work for the Radiological Sciences Department consisted of Aquatic Biology calculations, sheep thyroid, and radioanalysis calculations, wind study calculations for June, and weather calculations for June. Data for the wind study calculations were received for the first time this month on mark-sense cards. Procedures for processing the data in this new form are presently being written. It is expected this change will result in a significant reduction of machine processing costs and card storage requirements.

Graphics work for the Radiological Sciences Department included preparation of twelve plates for a report titled "River Survey - Final Report"; completion of two large control charts to be used in plotting 107 Effluent Activity, I^{131} and Ru Emissions; preparation of six plates for document HW-32086 titled "Neutron Scattering from the Walls and Air of a Laboratory"; and preparation of five plates for document HW-32121 titled "Age Diffusion Theory for Beta Ray Problems."

Five routine IBM reports were completed for the Radiological Sciences Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

A report containing results derived from the orientation film questionnaires returned during April, May, and June has been completed. These questionnaires were filled out and returned by new employees during their orientation period, after viewing the film "Here's Hanford." Tabulation and analysis of the responses made on these questionnaires indicate employee opinions about the film and give an idea of whether or not certain information about G. E. policies and plans is gained from the film. Comparisons were made of the responses of

the following subgroups: 1) rehires and new employees, 2) male and female employees, and 3) four major personnel classes of employees. (Letter: "Orientation Film Questionnaire", to J. B. Thompson.)

The further analysis of attitude survey data for the Employee and Public Relations Department has been initiated. Attitudes of employees in separate personnel classes within each section are being examined.

A list was prepared of all female employees with two or more years of college education.

Graphics services for the Employee and Public Relations Department included plotting of current data and issuing the Absenteeism charts for the first quarter in 1954; posting figures to the Monthly Accident Statistics Report; airbrush touch-up of photos of equipment for the Photo Unit; and preparation of signs and visual aids for the Training Unit.

For the Employee and Public Relations Department 40 routine reports and 8 non-routine jobs were completed for a total of 48 IBM service requests.

FOR THE FINANCIAL DEPARTMENT

The use of a tape preparing typewriter for the setting up of Property Accounting records on punched cards was approved and a machine has been ordered. Upon receipt the machine will initially be used for the recording of property for the 100-K area. A system is being developed around the punched card equipment.

The June 10 increase was made effective for the HAMEC employees with the week ending July 18, 1954. The retro-active portion of this increase was also paid at this time. Cost entries were prepared to reverse the accruals for the retro-active portion.

Revisions made to IBM internal operating procedures at the request of the Financial Department were: The check distribution was revised to include four digits or organization for the Separations Section and three digits for all other organizations. Voucher payroll procedures were revised to include the handling of retro-active payments. Certain changes were made in exempt payroll reports.

Special requests processed included procedures for the processing of six month salary analysis of weekly paid employees, a listing of transportation personnel, the preparation of DuPont annuity reports, the calculation and listing of insurance deduction rate changes due to salary increase of June 10, and the reporting of card counts for the various detail cards used in cost procedures.

A study of the variation of the underwater bucket weights of irradiated four- and eight-inch slugs was conducted for the Accountability Section to determine if it is feasible to use accountability procedures based upon bucket weights rather than actual piece count. To do this, it was necessary to determine the variation between individual buckets within each of the given areas, the amount

of variation between days reported within the areas, and the variation existing between areas to arrive at the solution of the problem. (Results and recommendations were given in a Secret Rough Draft report: "Variation in Bucket Weights for 4" and 8" Slugs," to V. D. Denihee.")

Work on the calibration of tank 15-6 by the method of least squares has been completed. A table has been supplied giving liquid level versus gallons and also the 95% level precision associated with each gallon value. (Letter: "Tank 15-6 Calibration," to C. B. McKee)

The problem of predicting product holdup and the variation in holdup for T plant is still under investigation. However, the lack of appropriate data indicates that, at present, a reasonably precise estimate of product holdup cannot be obtained.

Graphics services for the Financial Department included final preparation of charts and photo copy for the publication of the "Incentive Fee Report"; preparation of a chart titled "Excess Materials and Equipment"; revising SF Accountability Flow Chart masters; plotting current data to chart masters and publication of the monthly "HAPO COSTS" report; and preparation of the Operating Costs and Budgets charts.

For the Financial Department 532 routine IBM machine reports and 23 non-routine jobs were completed for a toal of 555 service requests. In addition, 31,626 paychecks and 31,626 earnings statements were prepared and 12,936 cancelled paychecks were reconciled.

FOR THE ATOMIC ENERGY COMMISSION

The Hanford release report for June was completed. A new computational scheme for preparing this report has been devised, and will be used in recomputing the entire collection of past data. Considerable planning work is anticipated in effecting this change.

The purchase order analysis reports were revised to eliminate the reports by "Item Class" and "Vendor Locations", from the routine monthly procedures. These reports are no longer required.

For the Atomic Energy Commission 3 non-routine reports were prepared by IBM.

SUMMARY

During the month of July 101 statistical, mathematical, procedural, and graphical problems were completed, and as of July 31, a backlog of 219 problems were on hand. In addition 594 routine IBM reports and 42 non-routine IBM jobs were completed for a total of 636 IBM service requests; 31,626 paychecks, 31,626 earning statements were prepared, and 12,936 cancelled paychecks were reconciled.

A total of 52 new forms were designed, 248 orders for forms were received of which 2 were rejected and 246 approved for a total of 547,730 copies.

Department Serviced	Percent of Services Rendered				
	Units				Operations Analysis Section
	Applied Mathematics	Procedures	Computing	Graphics	
Manufacturing	12	2	3	25	8
Engineering	30	38	36	42	35
Plant Auxiliary Operations	1	0	3	0	2
TOTAL OPERATING DEPARTMENTS	43	40	42	67	45
Radiological Sciences	4	0	1	11	3
Employee & Public Relations	3	6	1	4	2
Financial	4	17	54	12	32
TOTAL STAFF DEPARTMENTS	11	23	56	27	37
Administrative and General	38	37	0	6	15
A. E. C.	8	0	2	0	3
TOTAL	100	100	100	100	100