727795 HW-31964-DEL

Copy No. [redacted]	Series [redacted]
Pages 360 359	Copies [redacted]

55515

MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

MAY 1954

Compiled By
DEPARTMENT MANAGERS

June 22, 1954

RICHLAND, WASHINGTON

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

[redacted]

Route To	Read By	Date
[redacted]		

[redacted]

[redacted]

COPY NUMBER	DISTRIBUTION
1	F. K. McCune - Yellow Copy
2	K. H. Kingdon
3	K. R. Van Tassel
4	W. E. Johnson
5	J. E. Maider
6	A. B. Greninger
7 - 8	Atomic Energy Commission Hanford Operations Office Attention: D. F. Shaw, Manager
9	Atomic Energy Commission Hanford Operations Office Attention: J. J. Joyce
10	Atomic Energy Commission For: B. M. Fry, AEC, Washington
11	700 File
12	300 File

[redacted]

TABLE OF CONTENTS

MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

MAY 1954

GENERAL SUMMARY

Production Operations

In the Metal Preparation Section production of normal material for the month was 93 percent of forecast. Lower than forecasted production was due principally to major changes in the bare slug inspection method. The overall canning yield for May was 82.7 percent.

The use of the Zyglo method for inspection of bare slugs was instituted during the month.

The canning of the Al-Li alloy slugs (N) and the enriched fuel slugs (J) was discontinued.

The total reactor input plutonium production was 104 percent of the official forecast and the output was 132 percent of forecast.

A total of 19 ruptures occurred during May including 18 normal uranium slugs and one "C" slug.

The Redox production for the month was 132 percent of forecast and the T plant was 126 percent. TBP production was 189 percent of the official forecast. UO_3 facility production was 169 percent of forecast. All commitments for 234-5 production were met.

Engineering Technology

Total design for CG-558, Reactor Plant Modification for Increased Production, advanced to 18.2 percent completion during May. Authorization was received to proceed with revisions to the condensor design for the Purex Tank Fram, Project CA-513. Design effort on CA-514 was expedited in order to complete major elements of the 313 Building during the month. Total design is 95 percent complete. Design of the 313 Building structure and equipment is approximately 97 percent complete.

The local Building Trades Council called a work stoppage by all construction craftsmen on May 5, 1954 as a protect against the presence of Cisco Construction Company, a non-union contractor. On May 7, the AEC stopped work being performed by Cisco on the 151-KW and KE substations and the Recuplex CAW Facility, and the construction craftsmen returned to work.

Thirty-six informal, 4 Class I and 3 Class II radiation incidents were recorded.

Personnel and Services

There was one major injury recorded during the month of May. Minor injuries decreased from 387 to 289.

The employee separation rate decreased .67 percent for April to .64 percent for May.

As of May 31 there were 280 housing applications pending.

STAFF

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

HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
MAY 31, 1954

	EXEMPT		OTHER		TOTAL	
	5-31-54	4-30-54	5-31-54	4-30-54	5-31-54	4-30-54
Engineering Department						
General	18	17	74	74	92	91
Design	171	174	129	129	300	303
Project	270	268	169	170	439	438
Technical Section						
General	10	10	2	2	12	12
Applied Research	121	122	52	52	173	174
Separations Technology	116	121	39	39	155	160
Pile Technology	105	101	66	66	171	167
Fuel Technology	73	71	70	71	143	142
Advance Technology	11	11	1	1	12	12
Manufacturing Department						
General	15	15	7	7	22	22
Reactor	267	265	1 129	1 077	1 396	1 342
Separations	288	291	1 264	1 238	1 552	1 529
Metal Preparation	97	96	450	429	547	525
Plant Auxiliary Operations Department						
General	1	1	1	1	2	2
Electrical Dist. & Telephone	30	30	139	139	169	169
Transportation	44	45	443	442	487	487
Purchasing & Stores	54	52	229	226	283	278
Plant Protection						
General	1	1	1	1	2	2
Patrol & Security	59	59	441	443	500	502
Safety & Fire	30	30	107	107	137	137
Office Services	13	20	177	281	190	301
Administration Main. Service	12	10	86	52	98	62
Operations Analysis	39	40	61	65	100	105
Financial Department						
Financial General	6	6	4	4	10	10
Costs & Budgets	26	27	99	101	125	128
General & Personnel Accounting	18	18	113	114	131	132
Property Accounting	16	15	41	40	57	55
Audits & Procedures	18	18	3	3	21	21
SF Accountability	5	5	20	22	25	27
Employee & Public Relations Dept.						
Community General						
Community Operations	68	69	177	169	245	238
Real Estate Services	22	22	162	164	184	186
Health & Safety	54	54	211	213	265	267
Management	7	7	2	3	9	10
Salary Administration	5	5	6	6	11	11
Employee Relations	21	21	40	41	61	62
Public Relations	4	4	22	22	26	26
Union Relations	8	8	8	8	16	16
Technical Personnel						
Staff	4	4	6	7	10	11
Others	-	-	46	46	46	46

	5-31-54	4-30-54	5-31-54	4-30-54	5-31-54	4-30-54
Radiological Sciences Department						
General	3	3	3	3	6	6
Records & Standards	28	29	141	143	169	172
Biophysics	58	58	59	61	117	119
Biology	34	36	38	37	72	73
Engineering	6	6	1	1	7	7
Legal	3	2	2	3	5	5
Special Study	3	3	2	1	5	4
TOTAL	2 262	2 270	6 343	6 324	8 605	8 594

AREA PERSONNEL DISTRIBUTION

MAY 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	26	82	-	11	50	-	72	54	264	336	895
Other	17	31	3	47	23	-	19	28	196	238	602
Total	43	113	3	58	73	-	91	82	460	574	1 497
Manufacturing Department											
Exempt	80	58	53	73	12	-	8	261	97	25	667
Other	281	264	425	168	13	-	105	1 126	451	17	2 850
Total	361	322	478	241	25	-	113	1 387	548	42	3 517
Plant Auxiliary Operations											
Exempt	26	7	8	7	7	-	11	17	11	189	283
Other	55	55	83	57	69	11	65	162	99	1 029	1 685
Total	81	62	91	64	76	11	76	179	110	1 218	1 968
Financial Department											
Exempt	-	-	-	1	-	-	1	2	5	80	89
Other	-	-	2	2	-	-	3	1	17	255	280
Total	-	-	2	3	-	-	4	3	22	335	369
Employee & Public Relations											
Exempt	-	2	-	1	-	-	4	2	2	182	193
Other	4	10	8	4	4	-	2	6	20	622	680
Total	4	12	8	5	4	-	6	8	22	804	873
Radiological Sciences											
Exempt	1	-	36	-	-	-	2	17	62	11	129
Other	4	-	41	-	-	-	6	19	158	14	242
Total	5	-	77	-	-	-	8	36	220	25	371
General											
Exempt	-	-	-	-	-	-	-	-	-	6	6
Other	-	-	-	-	-	-	-	-	-	4	4
Total	-	-	-	-	-	-	-	-	-	10	10
Total Exempt	133	149	97	93	69	-	98	353	441	829	2 262
Total Other	361	360	562	278	109	11	200	1 342	941	2 179	6 343
GRAND TOTAL	494	509	659	371	178	11	298	1 695	1 382	3 008	8 605

MANUFACTURING DEPARTMENT

MAY 1954

May 11, 1954

METAL PREPARATION SECTION

The net production of acceptable slugs was 239 tons which was 93 percent of the official forecast. The production was below forecast principally because of the diversion of a portion of personnel to expedite new inspection methods incorporating the use of Zyglo. A total of 209 tons was canned as eight-inch slugs and 30 tons as four-inch material with canning yields being 83.5 percent and 79.4 percent respectively. The eight-inch canning yield decreased 1.8 percent from the previous month, the major causes for operation being marred surfaces, poor bonds and bad welds.

Fabricating defects such as seams and striations in uranium slugs have given evidence of being possible causes of split-type ruptures. In order to facilitate the detection of this type of defect during bare slug inspection the use of Zyglo was started early in the month on an experimental basis. On May 12 the use of this fluorescent penetrant was set up in the routine inspection operation. The bare slug rejection rate resulting from the more rigid inspection was approximately 21 percent.

On May 24 the canning of lithium alloy slugs was discontinued. A total of 1941 of these slugs was canned during the month with a yield of 87 percent. The canning of enriched uranium-aluminum alloy fuel slugs for the tritium program was also discontinued on May 28 with a monthly production of 4243. The lower than average canning yield of 69.5 percent resulted from the canning of approximately 50 percent recovered material.

REACTOR SECTION

The total input plutonium production was 104 percent of the official forecast. The output production was 132 percent of the forecast and exceeded the forecasts because of the large discharges resulting from the downward adjustments in goal concentrations made necessary by the slug rupture rate.

The overall reactor operating efficiency was 80.3 percent, being adversely affected by the outages resulting from 19 ruptures and by a prolonged outage associated with process tube leak testing.

The established maximum operating levels, excluding enrichment burnout, were increased a total of 51 MW during the month. This increase (Pu + J/N) was attained at C Reactor as the combined result of increased intermediate tube power limits, increased total reactor water flow, and flattening improvements following elimination of the central

REACTOR SECTION (Continued)

higher-tube-power experimental zone. At the other reactors, increased inlet water temperature adversely affected power levels. The program for discharging normal irradiated uranium at two concentrations continued as originally planned, 88 tons of metal being discharged at the low concentration and 216 at the higher concentration.

A total of 19 slugs failed at all reactors during May, including 18 uranium slugs (two four-inch and sixteen eight-inch) and one C slug. The total outage time resulting from the ruptures was 513.9 hours. The average concentration of the ruptured eight-inch material was 678 MWD.

During May a total of 28 reactor scrams occurred. Twenty of the scrams at B, C, D, F and H Reactors were caused by normal panellit system difficulties. One scram at DR resulted from a short circuit at a junction box and the subsequent outage was 38.1 hours. Two of three scrams at H Reactor were caused by incidents in the P-13 recirculation facility, and one resulted from the malfunctioning regulator on a water recirculation study. Three scrams occurred at C Reactor, one caused by a water pressure surge during a pump change at 190-C, a second caused by improper Beckman by-passing and a third by a flow adjustment in a production test tube. One scram at D Reactor resulted when a vertical rod slipped out of the upper limit switch. Total outage time charged to the scrams was 47.1 hours.

The offsite shipment of the irradiated J material continued throughout the month.

The test irradiation program for thorium at the H Reactor progressed satisfactorily, with less than one percent of the reactor production involved.

During May, extensive work related to horizontal rods continued at B, DR and F Areas. At B Area, thimbles No. 4-B and 7-B, blanked off in April, were removed and replaced. Thimble No. B-B, found to be leaking in April but left in service, was blanked off for later replacement. During a scram, rod No. 6-B became stuck approximately one-half of the way into the reactor, and was removed from service. Recent thimble work at B reactor has reduced daily gas losses from approximately 30,000 cu. ft. to 6,000 cu. ft. At DR Reactor all thimbles were pressure tested, and Nos. 2-DR, 4-DR, 7-DR and 8-DR were found to be leaking. None of the thimbles were replaced since

[redacted]

REACTOR SECTION (Continued)

their removal is scheduled in August. At F Reactor, thimble No. 2-F was removed and replaced, and No. A-F was removed, but attempts at replacement during two outages were unsuccessful due to graphite binding.

Three major process tube leaks were found and corrected during the month, one at the F Reactor and two at H. The water collectior at F was approximately 360 gallons and at H for the two leaks was 930 gallons.

SEPARATIONS SECTION

The Redox production was 132 percent of the official forecast for the month. The T Plant production of low g/t product was 126 percent of the forecast.

The Redox plant, except for rate reduction to 5 and 6 tons power day for short periods, maintained an operating rate of 7 tons per day until May 14 when the columns were shut down for column flushing. Following a twelve hour shutdown, operation was resumed at a 7 ton/day rate until May 20 when a waste line leak in the 241-S diversion box necessitated another shutdown. On May 23 the plant was started, but at a reduced rate of 5 tons per day due to feed preparation difficulties which limited feed supply. Installation of a new centrifuge feed tank jumper permitted a rate increase to 7 tons per day on May 27. At month end, a leak that had developed in the H-4 oxidizer pot coil was resulting in irregular rates varying from 5 to 7 tons per day. The silica gel experimental unit for decontamination of high gamma uranium product was placed in operation on May 24. The concentrated salt wastes from Redox were diverted to the new 241-SX tank farm on May 19.

The TBP plant production established a new record which was 189 percent of the official forecast. The operation was nearly continuous throughout the month. The total outage time was 55 hours on the A line for vessel flushing and replacement of the RA column feed pump and 39 hours on the B line for vessel flushing. A maximum instantaneous rate of 17 tons per day was attained, and the total production averaged 11 tons per day for the month.

The T plant operation was essentially normal with low concentration metal being processed throughout the entire month.

The UO_3 facility production was 169 percent of the official forecast. A total of 13 cars of powder was shipped offsite.

The 234-5 commitment of shapes was [redacted] and 100 percent of the commitment of the unfabricated buttons was attained. The required nitrate production for shipment was also produced.

SEPARATIONS SECTION (Continued)

The waste evaporators operated throughout the month with volume reductions of 33.6 percent at B and 34.3 percent at T. The feed for both evaporators was TBP waste.

The waste metal removal rate was highly satisfactory throughout the month with an average of 11.5 tons per day. The BX and TX farms furnished the larger percentage of the material with minor quantities from the U farm. A small amount of 2.8 year old supernate from the 114-TX tank was blended with the normal TBP feed and was processed through the plant on a single cycle. Decontamination was satisfactory but conclusive test results were not possible due to the limited amount of the material processed. The supernate from the first cycle waste in tank 110, 111,112-BX was cribbed. These tanks are essentially empty with only a small amount of sludge remaining.

There was no production at the Tritium Extraction Facility due to the delay at the request of the AEC in the discharge of feed material.

GENERAL

Personnel

Total on Roll May 1, 1954	3422
Accessions	122*
Separations	21*
Total on Roll May 31, 1954	3523

*Does not include intra-department transfers.

for J. E. Maider
Manager - Manufacturing

MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF MAY, 1954

May 11, 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
J. R. Young, Reactor Section	Tubular Reactor Process Tube Dummy Slugs

for J. E. Maider
Manager - Manufacturing

[redacted]

MONTHLY OPERATING REPORT

MAY 1954

1.

2.

3.

4.

DECLASSIFIED
WITH DELETIONS

[redacted]

5.

[redacted]

[redacted]

7.

[redacted]

[redacted]

HW-31964

DECLASSIFIED
WITH DELETIONS

DECLASSIFIED
WITH DELETIONS

[redacted]

Ea-5

1210705

[redacted]

[redacted]

[redacted]

June 3, 1954

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
MAY, 1954

I. RESPONSIBILITY

The Power and Maintenance Sub-section assumed the responsibility for janitorial services for 300 Area on May 17, 1954, involving one exempt and 23 non-exempt personnel. The responsibility of the Process Sub-section was changed during April to include process conformance for product uniformity at the FMPC rolling mill. This responsibility is being fulfilled by examination of metallurgical samples at FMPC by Hanford observers.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	May	April	Year To Date
Acceptable Pieces Canned (4")(Tons) Gross	30	19	116
Acceptable Pieces Canned (4")(Tons) Net	30	18	113
Canning Yield (4")(%)	79.4	65.0	70.1
Acceptable Pieces Canned (8")(Tons)Gross	210	224	957
Acceptable Pieces Canned (8")(Tons)Net	209	223	951
Canning Yield (8")(%)	83.5	85.3	78.8
Total Acceptable Pieces Canned (Tons)Gross	240	243	1073
Total Acceptable Pieces Canned (Tons)Net	239	241	1064
Acceptable Pieces Canned (4" and 8") (% of Forecast)	93	96	90
Autoclave Frequency (4")(No./M)	.00	.00	.00
Autoclave Frequency (8")(No./M)	.00	.00	.02
J-3 Slugs Canned (pieces)	4243	9799	35208
N Slugs Canned (pieces)	1941	11100	33177
Chem. 10-66 Canned (pieces)	0	300	746
Special Request (man hours)	536	557	2732
305 Routine Tests (man hours)	393	626	2202
305 Special Tests (man hours)	405	258	5486

[redacted]

1. Statistics (Continued)

	May	April	Year To Date
Average Steam Generated (M lbs/hr)	22.9	32.5	
Maximum Steam Generated (M lbs/hr)	42.0	47.0	
Total Steam Generated (M lbs)	16800	23100	
Coal Consumed (Tons)	1141	1542	
Sanitary Water from 3000 Area (million gals)	46.5	42.5	
Total Water from 3000 Area Average Rate (GPM)	1042	952	
Chlorine Residual (ppm)	.31	.39	

2. Activities

The net production of acceptable slugs was 239 tons of which 87 percent were eight-inch. Future production of canned slugs will be all eight-inch after approximately 14 tons of bare four-inch slugs on hand are canned.

The eight-inch canning yield decreased 1.8 percent from the previous month, the major causes for rejection being marred surface, poor bond, and bad weld. The four-inch canning yield increased 14.4 percent as a result of a large reduction in poor bonds.

Fabricating defects such as seams and striations in uranium slugs have given evidence of being possible causes of split-type pile ruptures. In order to reduce the frequency of these ruptures on acceptable slugs as well as to facilitate the detection of these defects at bare slug inspection, the use of Zyglo inspection was started early in May on an experimental basis. The Zyglo inspection has been used in conjunction with the pickle inspection.

Based upon a preliminary Zyglo inspection of about 600 slugs, it became apparent that two categories of acceptable slugs were necessary and these were designated as Class W and Class X. Under this inspection method, the Class W slugs were defined as sound slugs being visually free of all surface defects. Class X slugs contained minor striations and some seams.

In view of the expected high quality of these Class W slugs, a production test is planned by the Reactor Section to determine the exposure levels possible with slugs which are free of visible defects.

Since the present quality level of as-received bare uranium slugs does not permit enough Class W slugs to completely charge the reactors, Class X slugs are also accepted. In order for the Reactor Section to use two categories of material, sufficient quantities of each must be available to be of practical value. About 15 tons of slugs have been inspected and it appears that approximately 51% of the slugs would be classified as W, 28% as X, and 21% as reject. Because of the interpretative nature of the inspections, it is anticipated that these relative quantities may vary with as-received slug quality.

More stringent bare slug inspection standards have doubled the bare slug rejection rate and reduced the working inventory of material available for canning.

There were no autoclave failures during the month.

2. Activities (Continued)

A test was run using index caps on the canning lines for four days to evaluate the use of this cap. The test was halted, however, because the release agent did not completely part the AlSi from the cap. Other means of separating the AlSi from the cap are being investigated.

3. Special Operations

Four thousand two hundred forty-three enriched uranium-aluminum alloy fuel slugs were canned with a canning yield of 68.6 percent. The lower-than-average yield experienced was a result of canning approximately 50 percent recovered material. The canning of the these slugs for the Mint program has been discontinued and at month-end only a few canned pieces remain in process to be tested.

One thousand nine hundred forty-one lithium alloy target slugs were canned with a canning yield of 87 percent. This operation was discontinued on May 24, 1954.

4. Schedule Variance

Canned slug production was seven percent below forecast because of the diversion of manpower to the Zyglo operation. This necessitated operating the canning lines without relief for most of the month. The forecast was based on 100 percent relief for the canning lines.

B. Equipment Experience

1. Operating Continuity

The canning line efficiencies remained at a high level of 93 percent for the month.

2. Inspection, Maintenance, and Replacements

Mechanical difficulties were experienced with the duplex agitators and it was necessary to completely overhaul one agitator. A more comprehensive preventative maintenance program is planned for this equipment.

Some operating difficulties were encountered with the two ultrasonic testing machines from failures of the electronic system and the drive mechanism. As one of these machines serves as a spare, only two hours' time was lost on the canning lines.

The Miz I and Miz II testers were moved into 313 building and preliminary work was done in conjunction with Process and Technical personnel to evaluate the operation and reliability of the machines.

C. Improvement Experience

1. Production Tests

No activity.

[redacted] DECLASSIFIED

2. Process Tests and Revisions

The frost test air bath capacity, which has been a bottleneck during the warm summer months, has been increased by 30 percent. This improvement was made possible as a result of a study in which it was determined that the minimum time required for slugs in the bath could be reduced.

The use of the R-20 coating on canning tools was resumed after a study showed that the coating was not the cause of poor bond rejects. The savings to be realized through longer tool life have been estimated at $320 a month.

Grooved eight-inch cans were used for regular production during the last part of the month and the results obtained were highly satisfactory. Of 16,000 slugs canned, only one AlSi reject occurred. All future production of eight-inch slugs will be in grooved cans.

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

No significant change is anticipated in the total cost of direct labor. The effect of improved yield and one less operating day will be offset by the additional labor required for the Zyglo test on bare slugs.

2. Material Variance

Material costs are not expected to change appreciably.

3. Other Costs

Other costs are expected to increase slightly. This is attributed to payment for one holiday and a general increase in I.M.E. because of less special production than previously scheduled to absorb part of these costs.

E. Plant Expansion

1. Project Status

Project CA-514 - "Expansion of 300 Area Production Facilities." Design of the overall project is 94% complete and construction 34% complete. The difference in percent of completion for construction reported above and that previously reported reflects a reporting change which excludes the cost of equipment on order. The total funds authorized for this project was increased from $4,135,000 to $5,085,000 by Work Authority No. CA-514 (9), dated April 20, 1954. Total project costs to date amount to $2,133,000.00.

Phase II construction on the 313 building addition is about 56% complete. Final acceptance has been made on the roofing of the building storage bay doors and Hauserman partitions. A preliminary inspection has been held on the structural steel.

1. Project Status (Continued)

Material take-offs have been started for the renovation of the 3707-A building as a Maintenance change house and the 3707-B building as a janitorial facility.

Construction of the 3701-L Badge House and parking lot additions was completed with only minor exceptions being noted on the badge house during final acceptance inspection on May 27, 1954.

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

Scoping of the 3X facilities is 90% complete, detailed design 79% complete and construction 70% complete. These percentages reflect additional design requirements for iridite facilities in 313 building, slurry recovery of process solutions and bond test equipment. Total project costs plus commitments to date approximate $730,000.00.

Because of the reduction in slugs to be processed in 303-J building, the installation of expanded dry canning facilities in this building, as previously planned, cannot be justified. The Engineering Department estimated that an additional $120,000 would be required to make this installation. Current plans are to install outside doors, patch blacktop roads and entry ways to building, cover furnace pits, return borrowed equipment (2 lathes) and store purchased equipment in the north half of the building. This will cost approximately $20,000.00.

A final project proposal has been prepared for approval by Project Engineering, taking into account the above change on 303-J building. The total project cost is estimated at $960,000 of which $800,000 was previously authorized by A.E.C. Directive No. HW-318.

2. Plant Engineering

Material Handling procedures for the expanded facilities are now under study in order to establish a systematic flow of material and to minimize labor requirements. Process flow charts have been prepared to assist in the planning of essential material supply for the operating stations.

Tentative direct labor, direct materials, and I.M.E. Standards for 300 Area steam generation were established for landlord utilization in setting current rentals for space occupancy. Since the standards are based on historical data and current performance, further engineering study will be required to establish operating standards for control purposes.

A quantity of uranium slugs received from Fernald are immediately rejected at the pickle operation inspection station. At current levels of operation, shipment and return charges are in excess of $6,000 per month when the reject rate approaches 15 percent. An appreciable savings is evident if Fernald could provide a means of reducing the quantity of reject material included in shipments to Hanford. A complete report is documented in HW-31959.

A prototypic mechanical can stripper for dry canned material was designed and has been fabricated. It is now being tested prior to release for production use.

2. Plant Engineering (Continued)

A mock-up model of a semi-automatic slug stamping machine was fabricated and demonstrated. Design ideas were accepted and operation of the equipment was pronounced satisfactory. Drawings for a production unit have been completed and are being checked.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-31722	Monthly Report, Process Sub-section Metal Preparation Section, April 1954	EW O'Rorke	5-3-54

2. Non-Routine

HW-31959	Bare Uranium Reject Shipment Costs	RE Daling	5-26-54
HW-31796	History of Enriched Slug Canning	RL DeCenzo	5-5-54
HW-31684	Operational Experience of Triple Dip 8" Slug Canning	DL Layton	4-30-54
HW-31735	Sevac Canning Process J-3 Material	WC Mayer	4-30-54
HW-31533	Melt Plant History	WM Mathis	4-21-54
HW-31626	Report of Uranium Accountability in Metal Preparation Processes for the Quarter Ending 3-31-54	GF Yost	4-27-54
HW-31700	Evaluation of Hot Press Canning of Extruded "J" Slugs	RH Titman	5-3-54
HW-31713	Proposed Increase in Uranium Density Specification	SM Gill	5-3-54
HW-31750	Uranium Content of J-3 Slugs by Gamma Scintillation Counter	WG Hudson	5-5-54
HW-31773	Precision Associated with Normal Uranium Inactive Accounts	LT Hagie	5-6-54
HW-31850	Boron Contamination of Fuel (J) Slug Cores	TD Naylor	5-13-54
HW-31918	Hot Press Canning of Die-Cast Simulated "J" Slugs	TD Naylor	5-19-54

III. PERSONNEL

A. Organization

One exempt and 23 non-exempt employees were transferred into the Section during the month. This was a result of the transfer of responsibility for janitorial services from Plant Auxiliary Operations to the Manufacturing Department.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations	199	193	-6
Power & Maintenance	259	286	27
Process	42	42	0
Plant Engineering	23	23	0
Section Total	527	548	21

DECLASSIFIED

12-10-53

C. Safety Experience

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

An incident involving the explosion of an oxygen regulator on a portable welding outfit on May 20, 1954 was investigated. The investigation revealed that marks on the regulator might have been caused by tampering by unauthorized personnel and the possibility of servicing of gauges by unauthorized personnel.

D. Radiation Experience

One Class I radiation incident occurred on May 31, 1954 which involved potential over-exposure of two operators and a shift supervisor. This incident resulted from efforts to resolve a possible thorium discrepancy. Since the handling of thorium metal is an unusual job and normally performed on a limited basis, the incident was a direct result of the lack of adequate protective procedures. An investigation of the incident has revealed no actual over-exposure was incurred by any of the personnel involved.

E. Personnel Activities

1. Visits and Visitors

J.M. Holeman presented a paper "Binocular Periscope Viewers" at the information meeting on hot laboratories at the Brookhaven National Laboratory.

S.M. Gill visited at the A.E.C. site at Fernald, Ohio to discuss uranium quality control.

J.R. Driear and J.J. Stanley of E.I. duPont de Nemours and Company, Savannah River Plant visited HAPO to discuss alpha canning.

2. Meetings

Twenty-seven members of the Metal Preparation Section attended training courses during the month.

Richland, Washington
June 7, 1954

MANUFACTURING DEPARTMENT
REACTOR SECTION
MAY, 1954

I. RESPONSIBILITY

The responsibility for 100 Area janitor services was transferred from the Plant Auxiliary Operations Department to the Reactor Section - Maintenance Sub-Section, effective May 17.

II. ACHIEVEMENT

A. Operating Experience

The total reactor input plutonium production during May was 104.2 percent of forecast and 102.9 percent of the April production. Plutonium production was higher in May than in April primarily because of the longer month, and a time operated efficiency of 80.3 percent, which was slightly above that for April. The May efficiency was adversely affected by outages, totalling 513.9 hours, associated with 19 slug ruptures, and by outages, totalling 89.8 hours, associated with process tube leak testing.

Reactor plutonium output production in May was 132.2 percent of forecast, and represented a record high month, exceeding the previous record month, April 1954, by 15.6 percent. Forecast was exceeded because of the large discharges resulting from adjustments in goal discharge concentrations during recent months.

A. Operating Experience (Continued)

The test irradiation program for J-Q (thorium) material at H Reactor progressed satisfactorily with less than one percent of H Reactor production involved. May production was only 1.7 percent of forecast, because of the suspension of the J-Q program as explained above. The forecast was based upon plans to charge 400 tubes of J-Q material at DR Reactor by June 15. At month end, the total J-Q tubes being irradiated were the 13 tubes originally charged at H Reactor in March.

Established maximum operating levels, excluding enrichment burnout, were increased a total of 51 megawatts during May. This increase was attained at C Reactor as the combined result of increased intermediate tube power limits, increased total reactor water flow, and flattening improvements following elimination of the central, higher-tube-power, experimental zone. At the other reactors, increased inlet water temperature adversely affected power levels.

A total of 19 slugs failed at all reactors during May, including 18 uranium slugs and one "C" slug. Rupture distribution by reactor and type is tabulated below

	B	C	D	DR	F	H	Total
Regular four-inch	-	1	-	-	1	-	2
Regular eight-inch	-	4	1	-	5	6	16
"C" material	-	1	-	-	-	-	1
Totals	0	6	1	0	6	6	19

The total outage time resulting from these ruptures was 513.9 hours. Average concentration of the ruptures was approximately 10 percent above the former goal concentration. One of the eight-inch slug ruptures at C Reactor was a cap failure, the first failure of this type experienced at C Reactor.

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	89.8	75.4	86.2	94.9	68.6	66.7	80.3
Reactor Outage Time (Hrs.)							
Plutonium Production	75.6	166.4	87.5	38.1	230.4	227.3	825.3
Special Irradiations and Tests	-	16.8	15.0	-	3.0	20.8	55.6
Total	75.6	183.2	102.5	38.1	233.4	248.1	880.9
Reactor Unscheduled Outage Time (Hrs.)	4.0	114.8	102.5	38.1	179.9	248.1	687.4
Metal Discharged (Tons)	83.5	38.9	51.8	2.3	48.6	78.2	303
Water Quality (ppm Iron)							
Raw Water - Average	0.34	0.31	0.29	0.50	0.21	0.41	-
Raw Water - Maximum	0.64	0.60	0.48	0.94	0.38	0.68	-
Process Water - Average	0.012	0.009	0.007	0.005	0.007	0.007	-
Process Water - Maximum	0.025	0.025	0.012	0.015	0.016	0.017	-
Pumped (MM Gals)							
Bldg. 190 to reactor	2026	3279	1922	1861	1575	1837	12500
Bldg. 182 to 200 Areas	-	-	310	-	71	-	381
Bldg. 181	5929		4786		1988	2180	14883
Steam Generated (MM Lbs.)	166		216		112	90	584
Coal Consumed (Tons)	9872		14000		6256	4984	35112

[redacted]

2. Activities

The program of goal concentrations for irradiated uranium continued throughout May essentially as described last month. Approximate tonnages discharged during May were 88 at the low concentration, and 215 at the higher concentration.

At C Reactor, Production Test 105-533-A, Supplement C, "Local Controlled Increases in C Pile Tube Powers," was terminated and the intermediate tube powers agreed upon with the Pile Technology Sub-Section were replaced with a 105 C outlet water temperature limit. This limit has been temporarily modified by an interim Reactor Section intermediate tube power limit of 925 kw which has been specified to minimize deterioration of the rear face pigtails. To further minimize pigtail deterioration, the process water pressure at C Reactor was increased from 385 psi to 445 psi which increased the total reactor flow from 82,000 gpm to 88,000 gpm.

During the discharge of a short rupture from tube 2670-C at C Reactor, the tube charge became stuck after discharging 26 slugs with the charging machine. Cause of the sticking was the end cap of the ruptured slug which became lodged in a recess of the rear nozzle. After subsequent attempts to dislodge the end cap failed, the "tool dolly" was used to backseat the remainder of the charge. The tube and charge were then removed together without incident. This is the second time that a "tool dolly" has been used to solve a major reactor operational problem.

On May 24, the Building 1906-H sewer water lift station was placed in operation, the first such action necessitated by the 1954 high water which rose approximately 15 feet during May.

During May, at DR Reactor, 15 J-N tubes were discharged to permit the charging of 15 "C" material tubes necessary to maintain adequate reactivity. At month end, the net total of J-N tubes in DR Reactor was 1350, 940 of which were charged for the second irradiation cycle, and 410 of which remained from the first cycle. At C Reactor, 11 J-N tubes were discharged in May in accordance with Production Test 105-562-A, "Slug Evaluation at Increased Levels for Tritium Production." At month end, 118 J-N tubes remain charged at C Reactor. Additional special charging included: at C Reactor, the discharging of two tubes of "C" material, one a production test tube and one containing a rupture, and the charging of three tubes of "C" material; and at H Reactor, the charging of four "C" tubes. During the charging of three of these tubes at H Reactor, "J" material was loaded by mistake. The error was corrected during the subsequent poison outage.

Shipment of irradiated "J" slugs by motor truck from DR Reactor to Arco, Idaho, continued during May, with approximately 2100 slugs shipped in 32 casks. During May, no Mint material was transferred from Building 105-B to Building 108-B. During the early part of the month, no irradiated material was available, and during the latter part, the Building 108-B facilities were not operating.

2. Activities (Continued)

The following tabulation indicates activities during May associated with special irradiations other than the Mint program noted above, and the J-Q program noted above and in the "Improvement Experience" section.

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	0	5	0
Production Tests	41	27	3
Total	41	32	3

B. Equipment Experience

During May, 28 scrams occurred. Twenty of these scrams at B, C, D, F, and H Reactors were caused by normal Panellit system difficulties. One scram at DR Reactor resulted from a defective plug-in cord short circuit at a junction box near the dummy elevator. A lack of reactivity prevented recovery of operation, and the subsequent 38.1 hour outage was used to charge enrichment columns, test for gas leaks and routine maintenance. Two scrams at H Reactor were caused by the P-13 recirculation facility, one resulting from spontaneous combustion of oil-soaked lagging on a pump, and the other resulting from failure of a flow regulator. One scram at H Reactor resulted from flow regulator malfunctioning causing a low flow on recirculation tube 0961-H (PT-105-506-E, "Recirculation Studies"). Three scrams occurred at C Reactor, one caused by test flow adjustments on tube 0777-C (PT-105-574-SR, "Blue Nose Experiment"), one caused by improper Beckman by-passing, and one resulting from a process water pressure surge during a pump change at Building 190-C. One scram at D Reactor resulted when a vertical rod slipped out of the upper limit switch. Total outage time charged to these scrams was 47.1 hours.

During May, extensive work related to horizontal rods continued at B, DR and F Areas. At B Area, thimbles No. 4-B and 7-B, blanked off in April were removed and replaced. Thimble No. B-B, found to be leaking in April but left in service, was blanked off for later replacement. During a scram, rod No. 6-B became stuck approximately one-half of the way into the reactor, and was removed from service. Recent thimble work at B Reactor has reduced daily gas losses from approximately 30,000 cu ft to 6,000 cu ft. At DR Reactor all thimbles were pressure tested, and Nos. 2-DR, 4-DR, 7-DR and 8-DR were found to be leaking. None of the thimbles were replaced since their removal is scheduled in August. At F Reactor, thimble No. 2-F was removed and replaced, and No. A-F was removed, but attempts at replacement during two outages were unsuccessful due to graphite binding. Based upon estimated dates of delivery for the new type horizontal rods, the outages for removal of all thimbles and installation of these rods have been tentatively scheduled as follows: D Reactor July, DR Reactor August, H and B Reactors September, and F Reactor October.

In May, three Building 190 process water pump motors failed during routine start-ups; Nos. 4 and 13 at H Area, and No. 11 at F Area. No. 4 motor was repaired locally, but Nos. 11 and 13 required complete rewinding, and were sent to the 200 Area.

B. Equipment Experience (Continued)

A 107-F effluent line leak developed five sections upstream from the previous leak in March. The leak was repaired with Dresser couplings during the next outage.

Three major process tube leaks were found and corrected during May. At F Reactor, a leak was found in tube 2683-F after pressure testing 658 tubes. Increasing abnormal water collection rates, noted in April, indicated the presence of this leak. Total water collected was approximately 360 gallons. Subsequent pressure testing of an additional 1315 tubes later in the month revealed approximately 50 minor rear nozzle leaks at the Van Stone flanges, which were corrected by tightening the nozzles, but no other major leak. Process tube leaks occurred at H Reactor in conjunction with ruptures in tubes 3188-H and 3061-H. Dew point analyses and loss of reactivity indicated the presence of the tube 3188-H leak prior to shutdown. Water collected from these leaks was approximately 930 gallons at month end.

A representative of the Travellers Insurance Company initiated the annual third party inspection of boilers at each of the 100-B, D, F and H Power Houses.

C. Improvement Experience

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

PT-105-506-E (Recirculation Studies)
Modification of flow and pressure lines and controls to increase the reliability of the system continued during the May outages at H Reactor. The system was operated without incident except for one reactor scram, resulting in 0.3 hour of outage time, caused by malfunctioning of the flow controller.

PT-105-517-E Suppl. A (100 Areas Filter Plant Tests)
High filtration rates of approximately six gpm per sq ft were maintained throughout May, with the length of filter runs improved from approximately four hours to six hours. To aid flocculation and filtration through more nearly adequate quick mixing, the inlet to the mixer was enlarged.

PT-MR-105-12 (Operation of H Reactor with Maximum Protection from the Panellit System)
All phases of this test have been superceded by appropriate limits in the Process Standards - Reactor. A final report, officially terminating the test, is being prepared.

PT-105-529-E (Increasing Power Levels at H Pile by Raising Permissible Exit Water Temperature)

PT-105-530-E (Full Pile Burnout Experiment)

C. Improvement Experience (Continued)

PT-105-567-A (Preliminary Irradiation of J-Q Columns)
H Reactor in May was limited by the 95 C outlet water temperature limit permitted by PT-105-529-E. Up to 50 percent helium, as permitted by PT-105-567-A, was utilized to maintain graphite temperatures within the J-Q loading below the limit. Irradiation of the 13 J-Q tubes continued without incident. The last four graphite samples scheduled for irradiation under PT-105-530-E were discharged in May, completing this test, except for the mining of a central tube channel.

PT-105-562-A (Slug Evaluation at Increased Irradiation Levels for Tritium Production)
This test irradiation program continued without incident in May. Eleven tubes of J-N material were discharged in conformance with the schedule outlined in the test.

PT-105-533-A (Local Controlled Increases in "C" Pile Tube Powers)
This test was terminated May 5. Subsequent operation has been limited by a 925 kw tube power limit as previously described in the "Activities" section.

Seven revised Process Standards - Reactor were approved and issued during May. These were standards titled "Process Tube Outlet Water Temperature Limits - Tube Corrosion," "Process Tube Water Temperature Rise Limits - Trip-Before-Boiling," "Horizontal Rod Cooling Water," "Reactor Atmosphere Composition," "Make-Up of Uranium and Uranium-Alloy Tube Charges," "Graphite Temperature and Rate of Rise Limits," and "Power Level Monitoring - Beckmans." The most significant change involved placing temporary restrictions on the use of trip-before-boiling limits to provide a period of operation at approximately current power levels until the reliability of Panellit gage calibration can be shown to be adequate for higher power levels.

The report of invention indicated below was submitted during May:

Inventor	Invention
J. R. Young	Tubular Reactor Process Tube Dummy Slugs

D. Events Influencing Cost

Maintenance Sub-Section costs will be increased significantly beginning in May as the result of assuming janitorial responsibilities for the 100 Areas which included the transfer to the Sub-Section of 24 applied labor employees, two supervisors, and additional applied material costs. However, total and unit Reactor Section costs will not be appreciably affected.

[redacted]

D. Events Influencing Cost (Continued)

Reactor Section charges to the expansion program for May will be greater than in April as the result of the addition of personnel for training prior to staffing the K Reactors.

Charges for reactor maintenance remained high during May as a result of the continuing high ruptured slug frequency, the process tube leak testing programs at F and H Reactors, and work on horizontal rods.

Power Sub-Section costs increased approximately $60,000 in May as compared to April, principally because of the longer month, a 5.6 percent increase in total process water flow, and increased chemical costs for water treatment necessitated by the seasonal decrease in river water quality. Coal costs increased approximately $13,000 or 4.2 percent in May. Filter plant chemical costs increased approximately $25,000 or 73 percent because of the increased turbidity of the raw water.

The above factors influencing cost are expected to be primarily responsible for an increase in plutonium irradiation unit cost in May of approximately one percent as compared to April in spite of a 2.9 percent increase in plutonium input production. Likewise, total irradiation unit cost is expected to be approximately one percent greater in May than in April.

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 May 19, 1954.

CA-431 (100-C Plant)
The Physical Completion Notice for Project C-431-A and B was approved by the Manufacturing Department on April 29. Work Orders for all outstanding work were issued by the Reactor Projects Section. The request for bids for the replacement of horizontal rods at C Reactor has been issued, with replacement tentatively scheduled for February, 1955. No work was accomplished on baffle repairs in the east 107-C tank, because of the required diversion of B Reactor effluent water to 107-C retention facilities. Installation of the vent piping for relief of excessive contaminated vapor in the cushion chamber and first effluent line junction box at Building 105-B has been started.

CA-512 (100-K Facilities)
Construction of KW and KE Reactors was 78 and 66 percent complete, respectively, as of May 31. KW and KE Water Plants were 91 and 66 percent complete. At KE Reactor, graphite stacking began on May 11, and was completed on May 19. At KW Reactor, the top "B" shield has been packed and grouted, and channels and skin plates are being installed to complete biological shield erection.

1. Project Status (Continued)

As originally received, Building 190-K primary pumps were found to have been unacceptable because of cracks in sections of the pump bowls. The vendor altered the design of the bowl, and the first re-designed bowl has been received and found to be apparently satisfactory. Inspection of secondary pumps by radiography is being continued.

CG-558 (Reactor Plant Modification for Increased Production)
The Project Proposal (HW-30205) for Project CG-558 (Reactor Plant Modifications for Increased Production) has been approved by the AEC in Washington, D.C., but the local AEC office has not granted approval of the requested $9,500,000 procurement funds to date. The Project Proposal is being studied with respect to 200 Area capacities, potential 100 Area gains in view of increased slug rupture rates, and project management aspects.

RDS-D-10) (Reactor and Water Plant Design Development)
RDS-D-11) Two new research and development studies related to existing reactor plants were initiated in May under RDS-D-10 and RDS-D-11. These were a study of increased power levels permitted by major increases in effluent coolant temperatures, with a portion of the study devoted to power recovery possibilities, and a study of an additional disaster safety system. A meeting to discuss and coordinate the Engineering and Manufacturing Departments thoughts on this second item was held May 19.

CG-438 (Ball 3X Facilities)
The Physical Completion Notice for Project CG-438 (Ball 3X Facilities) was issued April 28. Modification of the ball recovery systems and revision of the electrical circuits are proceeding as rapidly as shutdown scheduling permits.

2. Plant Engineering

A number of engineering and development studies were active in the Section during May. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in documents HW-31998 and HW-32028. Several items of interest are reported below:

The photographing of fire and firebed conditions in boiler furnaces continued in May at Building 184-F during a test run on No. 1 Bed Washington coal. This coal is from a new seam, and has been found to be superior to previous Washington coal used at HAPO. Under consideration is a proposal to investigate furnace conditions while burning various types of coal of different size gradations to determine the best size for a uniform firebed.

Sound level readings were taken in Buildings 190-H and 190-C under reduced flow conditions to obtain data for further study. Fabrication of a portable partial motor enclosure to be used in motor noise attenuation tests has been authorized, and recommendations have been made by the Plant Engineering Sub-Section relative to Ultracoustic material to be used in Building 190-C sound level tests.

2. Plant Engineering (Continued)

Preliminary results of tests to determine the effectiveness of a silicone-based, thermo-setting synthetic resin in reducing the contamination of surfaces exposed to contaminated, oil-bearing, process tube effluent during slug discharge were encouraging. While contamination of both treated and untreated tip-offs increased after each use, the treated tip-offs consistently showed only approximately one-half the radiation level of the untreated tip-offs. If successful, this method would reduce radiation problems in the discharge areas.

A method to expedite charge-discharge operations at C Reactor by eliminating the need for rear crossheader valving is being re-evaluated in view of the potential increased frequency of discharges that will result from decreased goal concentrations. Essentially, the method consists of reducing process water pressure to 60 inches at the top crossheader, and draining the rear risers through enlarged drain lines. In this manner all rear crossheaders may be valved to the drain by the operation of two valves, eliminating the need for individual crossheader valving.

F. Significant Reports

1. Routine

Monthly operating reports issued for April were:

HW-31734-A	Reactor Section	JH Warren	5-7-54
HW-31846	Operations Sub-Section	RO Mehann	5-1-54
HW-31711	Process Sub-Section	OC Schroeder	5-1-54
HW-31704	• Plant Engineering Sub-Section	FAR Stainken	5-3-54
HW-31747	Radiation Monitoring Sub-Section	PC Jerman	5-5-54
--	Maintenance Sub-Section	EE Weyerts	5-5-54
--	Power Sub-Section	JC McLaughlin	5-5-54

Other routine reports issued during May included:

HW-31947	"Monthly Progress Report, Reactor Section Expansion, May, 1954"	HT Wells	5-25-54
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	FAR Stainken	5-19-54
HW-31692	"Reactivity Balance and Associated Data - Period March and April, 1954"	AP Vinther	5-3-54

2. Non-Routine

HW-31535	"Process Tube Inspection and Program Recommendations"	WE Cawley	4-21-54
HW-31551	"Preliminary Flow Estimation for 105-C"	RR Bloomstrand	4-28-54
HW-31663	"Pressurization of Rear Crossheaders - Project CG-558"	CW Botsford	5-17-54
HW-31717	"C-Reactor Tube Power Limits"	OC Schroeder	4-30-54
HW-31730	"Production Test 105-4-MR, Evaluation of Poison Column Control Facilities - Supplement C"	RD Schilling	4-30-54

2. Non-Routine (Continued)

HW-31771-DR	"A Compilation of Photographs Showing the Status of B Reactor Process Tubes in February, 1953"	KW Hess	5-5-54
HW-31778	"Final Report - Process Test MR-105-5, Heat Balance of the Hot Water Recirculating System"	PC Walkup	5-7-54
HW-31819	"An Economic Evaluation of Reactor Outage Time for Charge-Discharge of Fuel Elements"	GH Dyer	5-12-54
HW-31868	"Safety Considerations for the Discharge of DR-10 Tube Charges"	GO Amy	5-17-54
HW-31957	"Comparative Burning Tests on the Special Purchase Washington Coal"	GW Wells	5-26-54
--	"Remote Area Monitoring Equipment"	RS Hammond	5-19-54
--	"Hot Water Recirculation Systems - 105-B, D, F, DR, and H Areas"	FAR Stainken	5-18-54
--	"Building Ventilation - 105-B and 115-B"	RJ Jaffe	5-24-54
--	"Symposium on the Effect of Noise on Hearing"	FAR Stainken	4-15-54
--	"Trip-Before-Boiling Limit Curves"	KW Hess DL Moore	5-30-54

III. PERSONNEL

A. Organization

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

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	3	0
Operations	291	309	+ 18
Maintenance	487	517	+ 30
Plant Engineering	32	31	- 1
Power	424	433	+ 9
Process	42	42	0
Radiation Monitoring	64	67	+ 3
Section Total	1343	1402	+ 59

Changes during May included 70 transfers into the Section, eight transfers out of the Section, and three terminations. The Operations and Power Sub-Section force increases are to provide manpower for operation of the K Reactors, while the Maintenance Sub-Section force increase resulted primarily from the addition of janitorial personnel in connection with the functional transfer noted under "Responsibility".

C. Safety Experience

During May, there were one potential Major Injury, and two Sub-Major Injuries in the Reactor Section. In addition, an injury which occurred in April was reclassified as a Sub-Major Injury on the basis of further investigation. The potential Major Injury concerned an electrician journeyman who injured himself on May 24 while moving a barrel of oil at Building 181-D. The injury was originally classified as a Minor Injury, but subsequent investigation has indicated that a hernia may have resulted. Sub-Major Injury No. 258 involved a serviceman who, on May 3, sustained a simple chip fracture of the left ring finger when the finger was struck by a bumper jack which slipped while being used to raise the tongue of a portable hydraulic platform. The second Sub-Major Injury in May, concerned a power operator who sustained a fractured rib on May 28 while acting as the patient during a demonstration of the armlift method of artificial respiration.

Sub-Major Injury No. 257, which occurred on April 24, involved a plumber-steamfitter who sustained a chip fracture at the base of the right thumb as a result of a violent wrench imparted by the shaft of a buffing tool which he was attempting to start by turning the shaft. The injury was initially diagnosed as muscle strains only, but subsequent x-rays, taken when the injury failed to respond to treatment, revealed the fracture.

The AEC Reactor Safeguard Committee met with Manufacturing and Engineering Department representatives on May 13 and 14 to discuss various aspects of reactor safety. The emphasis during these meetings was on problems relative to the loading of enrichment material in the reactors. Formal recommendations of the committee are expected to be made to the AEC in Washington.

To stimulate the safety program on an everyday basis, the Maintenance Sub-Section continued a program, started in April, of short "tool-box" safety contacts by supervisors at the start of each shift.

D. Radiation Experience

One Class I and one Class II Radiation Incident occurred during May. Class I Incident No. 361, at C Reactor on May 19, involved a plumber-steamfitter who, during the removal of a gun barrel, impulsively grasped the radioactive portion of the gun barrel to aid in moving it. Estimated exposure to the man was 50 mrads for the whole body and 350 mrads to the hands. Class II Incident No. 75, at H Reactor on May 16, involved an Operations Sub-Section operator who was exposed for an undetermined period to high-level radiation from a radioactive speck which became lodged in his hair in conjunction with discharge area work. Neither the source of the speck nor the time it was picked up by the man could be definitely established. Estimated exposure to the operator was between 2.5 and 9 rads. The investigations of these two incidents are detailed in documents HW-31932 and HW-31960, respectively.

The April radiation occurrence involving airborne contamination which resulted when a tube channel broach was dropped was removed from the tentative Radiation Incident category on the basis of negative urinalysis results.

D. Radiation Experience (Continued)

On May 22 at 100-B Area, contamination of shoes revealed what appeared to be fall-out of radioactive particulate matter, with the greatest concentration within the 105-B Exclusion Area. The specks ranged in activity up to 400 mrads/hr. Subsequent investigation and spectrum analyses indicating a ruthenium pattern have provided evidence that the particles are of Redox origin. However, the ratio between the two ruthenium isotopes present indicated that the particles were not freshly discharged, but rather appeared to have been transferred from another location by wind action.

E. Personnel Activities

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

On May 19, reimbursement authority was received to increase the rate for Chief Operator (Reactor) from Grade 22 to Grade 24. Thirty-four Operations Sub-Section Chief Operators were affected by this action. Also, on May 19, reimbursement authority was received for the recently negotiated non-exempt classifications of Radiation Monitor - Journeyman, Radiation Monitor, and Radiation Monitor - Trainee representing Grades 20, 18, and 11, respectively, was received. Forty-four members of the Radiation Monitoring Sub-Section were affected by this action.

Principal item of interest during May in regard to employee communications was the first three of another series of information meetings conducted by Reactor Section staff members for non-exempt employees. At these meetings, R. O. Mehann, Superintendent of the Operations Sub-Section, is discussing reactor operational difficulties, and J. C. McLaughlin, Superintendent of the Power Sub-Section, is discussing the organization and activities of his group. In addition, the program to train personnel of the Mechanical and Electrical Units of the Maintenance Sub-Section in the use of the armlift method of artificial respiration was continued. Other Sub-Sections are adopting similar programs for giving this training.

M. P. Johnson of the Power Sub-Section attended the American Water Works Association Convention in Seattle, Washington, on May 24 through May 26. He presented a paper on water processing methods at HAPO prepared by W. R. Conley of the Process Sub-Section, who was also scheduled to attend, but who was prevented from doing so by personal affairs which developed shortly before the meeting.

W. J. Ferguson of the Maintenance Sub-Section presented a paper on "Design and Testing of the World's Fastest Reversing Electric Drive" at the May tenth meeting of the Richland Section of the American Institute of Electrical Engineers.

June 7, 1954

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
MAY, 1954

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	May		April	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	54	0	12	2
Charges completed in Conc. Bldgs.	54	1	3	4
Special charges - Conc. Bldg.	9		22	
Charges completed-Isolation Bldg.	298	1	207	4
Average Waste Losses, %	2.3		6.1*	
Special charges-Isolation Bldg.	32		59	
Material balance, %	98.5		190.7*	
Yield through Process, %	96.2		184.6*	
Average cooling time (days)	88		98	
Minimum cooling time (days)	69		81	

* Distorted figures due to acid washes for cleanout of building for changeover from high to low MWD material.

1. Statistics (Continued)

b. Redox Operations

	May	April
Equivalent charges started	256	230
Charges completed	256	224
Tons Uranium delivered to storage	175.5	135.1
Average Production Rate per operating day, Tons	6.23	6.46
Average Daily Operating Rate for the month, Tons	5.66	4.50
Average yield, %		
Uranium	98.3	98.4
Plutonium	100.6	100.6
Total Waste Loss, %		
Uranium	0.90	0.88
Plutonium	0.66	0.53
Average cooling time, days	82	85
Minimum cooling time, days	70	75
Percent down time	9.2	30

c. 234-5 Operations

	May	April
Batches completed through Task II	228	222
Runs completed through Task III	139	131
Reduction yield, RM	97.4	98.0
Waste Disposal, units	5.1	3.25

d. UO_3 Operations

	May	April	To Date
Uranium drummed, Tons	475	419	6239
Uranium shipped, Tons	456	417	6161
Average cooling time, days (Redox)	93	96	
Minimum cooling time, days (Redox)	89	88	
Waste loss, %	0.23	0.03	

e. TBP Operations

	May	April	To Date
Tons received from Metal Removal	350	303	3776
Tons shipped to UO_3 Plant	340	301	3630
Average Production Rate per operating day, Tons	11.70	11.03	
Average Daily Operating Rate for the month, Tons	10.96	10.03	

DECLASSIFIED

e. TBP Operations (Continued)

	May	April
Average Yield, %	99.04	98.52
Total Waste Loss, %	0.81	0.81
Ratio Waste Volume returned to Volume removed	0.99	1.03
Percent Down Time	6.29	9.0

f. Mint Operations

	May	April
Charges started		
Vacuum Tanks Filled		
Product Purity, %		
Average Yield, %		
Product loss to stack, liters	0	0.6

g. Power

	200 East	200 West
Raw water pumped, gpm	1 340	7 761
Filtered water pumped, gpm	432	1 076
Steam generated, lbs/hr	37 258	199 027
Maximum steam generated, lbs/hr	52 000	242 000
Total steam generated, M lbs.	27 720	148 076
Coal consumed, tons (est.)	1 816	8 158

h. Waste Storage

	Equivalent Tons U	
	May	April
Metal Waste reserve storage capacity - T Plant	1005*	700
1st Cycle reserve storage capacity - T Plant	45	148
Metal Waste reserve storage capacity - B Plant	145	145
1st Cycle reserve storage capacity - B Plant	4	4
Redox Waste reserve storage capacity	1532**	198

*101,2,3-T tanks added to reserve.
**101,2,3,4,5,6-SX tanks added to reserve.

2. Activities

a. Redox Processing

Feed to the Redox Plant extraction columns was started late on April 30 after replacement of the 1A column feed valve, which

a. Redox Processing (Continued)

had failed on April 29. Except for temporary rate reductions to 5 and 6 tons per day due to mechanical or processing difficulties, a feed rate of 7 tons per day was maintained until May 14, when the columns were shut-down for flushing after flooding conditions developed in the 1A and 1S columns. Following a twelve hour shut-down for the column flushes, a 7 tons per day rate was maintained until May 20 when a waste line leak in the 241-S diversion box dictated another shutdown. Start-up was effected on May 23 at a reduced rate of 5 tons per day, due to feed preparation difficulties which limited feed supply. Installation of a new centrifuge feed tank jumper permitted a rate increase to 7 tons per day on May 27; however, a leak in the oxidizer (H-4) pot coil is limiting feed supply at month end and causing production rates to be varied between 5 and 7 tons per day. The Silica Gel "Tail-End" installation for decontamination of high gamma uranium product was placed in operation on May 14. The concentrated salt wastes from Redox were diverted to the new 241-SX tank farm on May 19.

b. TBP Processing

In the TBP Plant, a new production record was established as 340 tons of uranium were processed. Virtually the only lost time during the month was experienced in the first week in May when both extraction lines were shut-down for scheduled general maintenance work and vessel flushings. A maximum instantaneous production rate of 17 tons per day was attained, and total production averaged approximately 11 tons per day for the month of May.

c. UO_3 Processing

Production through the UO_3 Plant was a new record when 470 tons of uranium were processed. No mechanical or process problems which seriously affected production were encountered. Calcinations were conducted rather routinely in one of the new gas fired furnaces (Luckey Pot #19). Process variables relating to heat cycle and agitator speed were tested and the firing cycle is now determined automatically by control instruments. Mechanical unloading equipment was devised for removing the powder from the gas-fired furnaces such that it has been possible to mechanically remove ninety to ninety-five percent of the powder.

d. Waste Metal Removal

Waste metal removal rates were highly satisfactory with no major processing or mechanical difficulties being experienced. The continuous sluicing technique first used in the East Area Tank Farms in April, was also adopted in West Area and was the principal reason for the tank farms achieving an over-all removal rate in May which averaged 11.5 tons of uranium per day.

e. T Plant Processing

Operations in T Plant were essentially normal with all metal processed through the Canyon Building being 215 MWD material. Total metal dissolved (78 tons) during the month was a new record for a bismuth phosphate plant.

f. Isolation and Metal Fabrication Processing

In the Isolation Building, Redox material was limited to Cells 2 and 3 with Cell 4 reserved for processing 215 MWD material from T Plant. Isolation processing of the initial T Plant material resulted in high recycle volumes and a high gamma plutonium product; however, prompt process modifications resolved the difficulties and subsequent runs were normal.

In the Metal Fabrication Building, 100% of the production commitment for unfabricated metal and 182% of the commitment for final shapes were produced. The rehydrofluorination rate in Task II increased to approximately 11% as a result of equipment difficulties and testing of process cycle variables. Eighteen filter boats containing double batches of plutonium oxalate were satisfactorily processed through Tasks II and III.

g. Mint Processing

There was no production during May for the Mint Extraction Unit due to delaying the discharge of DR-10 material until a decision can be made concerning the use of enriched pile loads.

3. Special Operations

a. Waste Evaporators

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

Evaporator	Gallons Feed	Gallons Bottoms	Gallons Condensate	% Volume Reduction
242-B	525 937	349 250	176 687	33.6
242-T	393 365	258 378	134 987	34.3

b. Pu Recovery, 234-5

The equivalent of 16.1 bottles of product was processed in Metal Recovery (Hood 40), the equivalent of 1.6 bottles was processed in Powder Recovery (Hood 41), and the equivalent of 21.3 bottles of material was transferred to the Isolation Building for reprocessing.

c. UO_3 Powder Recovery - UO_3

The recovery of scrap UO_3 powder as well as powder from discarded filter bags was started in May. The scrap powder is returned to the process stream after screening to remove foreign materials, and the purity of the final product is not adversely affected since only a small volume is blended into each carload lot. Powder is recovered from the filter bags by means of a vacuum cleaner with a recovery of approximately 95%.

B. Equipment Experience

1. Operating Continuity

Redox down time totalled 68 hours and was primarily for replacement of a leaking jumper in the 241-S diversion box.

Total down time for the TBP Plant was 55 hours for A line and 39 hours for B Line. The outages were for scheduled maintenance work and column flushes on both lines and for replacement of the RA Column feed pump on A Line.

2. Inspection, Maintenance, and Replacement

a. Oxidizer (H-4) Pot Coil Failure - Redox

Partial failure of the H-4 pot coil was detected on May 21. The leak rate progressed from an estimated one gallon per minute when first detected to three gallons per minute at the end of the month. Pot replacement is planned during the June shutdown.

b. Jumper Failure - 241-S Diversion Box

A leak in a 241-S diversion box jumper on May 20 filled the remaining space in the catch tank and flooded the floor of the box before it was detected. The Redox Plant was shut-down for 56 hours until repairs were effected by jumper replacement.

c. RA Column Feed Pump Failure - TBP

The A Line RA Column feed pump failed on May 25 after six weeks of operation. Replacement was made with a spare unit on May 26.

d. Inspection of Fume Vent Header - UO_3

Inspection of the fume vent header in the UO_3 Plant calcination furnace room revealed severe corrosion. This piping, which was originally ten gauge, has corroded rather generally and the wall thickness is now very thin. Holes were found which ranged from pin point size to two inches in diamete

d. Inspection of Fume Vent Header - UO_3 (Continued)

and corrosion was especially severe at the welds. It is planned to replace this equipment in June.

e. Equipment Failures, Task II - 234-5

Equipment difficulties which contributed to the higher rehydrofluorination rate in Task II were loss of furnace vacuum due to poor door seals and leaks in the off-gas system, failure of two furnace retorts which were subsequently repaired by welding, and loss of three process gas preheater heating elements which were replaced.

C. Improvement Experience

1. Process Tests and Revisions

a. Metal Feed Preparation - Redox

Utilization of the stack gas strip filter monitoring system installed in April has permitted further improvement in the control of ruthenium emission by process means. Increasing the reflux to the maximum consistent with maintenance of vacuum in H-4 and reduction of the sparger air flow to approximately 15 cfm has resulted in a decrease in the average ruthenium emission from approximately 0.5 curies per batch at the end of April to less than 0.25 curies per batch at the end of May.

b. Silica Gel Tail-End Treatment - Redox

The temporary silica gel installation processed approximately 32 tons of high gamma uranium product achieving a reduction in activity of better than two-fold on an over-all basis and giving a DF of approximately 5 for Zr-Nb. When exposure rates at the top of the first absorber exceeded 3 rads/hr, the system was successfully regenerated and the system is currently processing 20 additional tons of off-standard product. Regeneration waste solutions were collected in a tank trailer and are to be routed via the 219-S building to the D-8 waste neutralizer for disposal. Processing the 52 tons of off-standard material through the silica gel installation eliminated the need for extraction column rework of at least 5 tons of the material, and extensive blending of the remainder, with a net savings estimated at $1,900.

c. Test Processing of 114-TX Material - TBP

Approximately 20% of the supernate from the 114-TX tank, which has a minimum age of 2.8 years, was blended with normal TBP Plant feed during the month and processed through the plant on

D. Events Influencing Costs

Total operation costs for the Separations Section are expected to be approximately ten percent higher in May than those incurred in April. The increase in costs reflects the new production records established by the TBP and UO_3 facilities, the high level of production maintained by Redox, and the increased production from T Plant. The cost of essential materials associated with these production achievements is the primary factor contributing to the increased total costs for the Section.

Total force of the Separations Section showed a net increase of twenty-one and was primarily due to the transfer of twenty-six janitor services personnel from the Plant Protection Section.

E. Plant Development and Expansion

1. Project Status

a. Project CG-496, Recuplex Installation

Construction efforts were limited to installation of ventilation piping, vessel supports, and installing a few vessels. Vessel and valve procurement continued to impede construction. The construction of the underground waste storage facilities by the Cisco Construction Company was halted during the month by AEC due to labor difficulties.

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

Stage I

Column delivery is expected to be complete by June 7. Canyon equipment fabrication by Minor Construction was completed on May 28. Jumper fabrication is approximately 80% complete and mock-up work on the first unit is in process. It is planned to install the new waste concentrator (D-12) during the shutdown as well as to replace the Feed Oxidizer (H-4).

Stage II

Construction of the 233-S Concentration Building is on schedule, with ready-for-operation date remaining at December 1, 1954. Erection of the 211 ANN storage tank is in process.

c. Project CA-539, Additional Redox Waste Storage, 241-SX

Construction at 96% is 2% behind schedule. The first six tanks were put in operation May 19, 1954. A punch list of items needed was turned over to the project engineer. Minor Construction will perform this work as well as all the instrument installations

c. Test Processing of 114-TX Material - TBP (Continued)

a single cycle. Decontamination was satisfactory but conclusive test results were not possible due to the limited amount of material processed. Additional testing will be made in June.

d. Reduced Process Volumes - T Plant

Experimental determinations made prior to the inauguration of the 215 MWD program in the Bismuth Phosphate Plant indicated that runs processed from 215 MWD/T uranium would require processing volumes 63 and 56% of standard through the first and second decontamination cycles, respectively. Since the inauguration of the 215 MWD/T uranium processing in April, a systematic reduction in actual processing volumes has been made possible by improved cake removal procedures. Preliminary results from the processing of fifteen runs indicate that the processing volume may be successfully lowered to 49% of standard through both the first and second decontamination cycles, thus decreasing essential material costs by $124 per run, and substantially decreasing the time cycle.

e. Continuous Sluicing and Blending - Tank Farms

A continuous sluicing technique instituted in the East Area farms in April was adopted in West Area in May. This new technique was principally responsible for the high uranium removal rates in May which averaged 11.5 tons per day, and was a suggestion submitted by a Process Operator. This method of operation eliminates the suspension of sluicing during blending. A small blend is prepared by transferring the required amount of slurry from the accumulator after a suitable gain in weight has been achieved. The volume of water removed is then replaced by adding water to the tank being sluiced and sluicing continues uninterrupted. After the weight loss from the blend has been recovered, another blend is prepared.

f.

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.

1. Project Status (Continued)

c. Project CA-539, Additional Redox Waste Storage, 241-SX (Cont'd)

that remain. Delivery of instrumentation for the vapor system is not expected until June; however, this will not jeopardize the tank farm operation.

d. Project CA-513-A - Purex

Purex design is 99.5% complete compared with a scheduled 100%. Construction as of May 17 is 38% complete compared with a 40.6% scheduled completion. The scheduled construction completion date has been changed from January 1, 1955, to February 1, 1955. The estimated ready-for-operation date continues to be August 1, 1955.

A revision request approving the HW #3 Flow Sheet was approved during the month.

Further investigation and study of the problem occasioned by the discovery of defective plates in the concentrators being fabricated by Electric Boat Division of General Dynamics Corp. have resulted in agreements to achieve both the best delivery date and best possible material in the concentrators under the circumstances. The ultrasonic testing method has not proven capable of detecting the faulty plate. However, work on this testing method and others is being continued with the intent of detecting inferior plate in two questionable spare units after they arrive, so that the inferior plate may possibly be replaced on site at some later date.

The AEC has approved the revision request for 241-A tank farm changes to take care of "burping." A revised flow sheet was recently approved and the Design Section is performing detail design.

It is presently planned that the operability tests for the Purex Plant will be performed by Manufacturing Department personnel after Acceptance Test Procedures are complete, but prior to acceptance of the facility by General Electric Company from the AEC. They will form the basis for acceptance by General Electric Company.

e. Project CG-187-D-II, Redox Production Facility

1) Sample Gallery Ventilation Improvements

A work order for fabrication of the riser hold-down clamp and flusher mechanism has been issued. Completion date is not firm, but it is hoped to perform part or all of the installation during the shutdown for installation of CG-535, Phase II equipment in June.

e. Project CG-187-D-II, Redox Production Facility (Continued)

2) Backcycle of 2DW and 3DW as 1A Scrub

3DW backcycle jumpers are being constructed. Installation will be made during June. Design of 2DW backcycle facility (D-14 concentrator plus jumpers) is scoped. Detailed design is scheduled to be completed in July.

f. Project CG-187-D-III, Redox Waste Water Disposal Basin

Water-level readings taken in the underground basin indicate that the percolation rate in the crib is not as high as the test rates upon which design was based. At a meeting held this month, it was decided to provide a temporary means of containing the overflow water from the underground basin in case the water usage exceeds the basin seepage rate. A revision to the project proposal will be started to increase the basin area. Backfilling of the old swamp is 85% complete and burial of the 207-S retention basin is partially complete. No contamination spread has been found. Physical completion is scheduled for July 1, 1954.

g. Project CG-580, Redox Cell Air Cleaners

Procurement and construction on this project have been suspended until September 1 pending results of an over-all investigation of the Redox contamination problem. This suspension resulted from a review which indicated that contamination controls, which have recently been put into effect for use during cell maintenance work, have been effective in halting any further release of gross contamination from the process cells. Preliminary work, such as obtaining procurement bids, will be carried on as far as possible, so that work may be resumed promptly if desirable.

h. Project CG-585, Oxidizer Off-Gas Treatment, Redox

Design of the Stage I equipment to be installed in June is complete. Fabrication of the new filter is expected to be complete by June 1. Cold side piping for the June installation is complete except for tie-ins to be made during the shutdown.

2. Manufacturing Engineering

a. Standards Program

The standard analytical requirements for all operating plants were revised to include a 5% allowance for re-sampling. The labor standards for the Isolation Building and the 222-S Laboratory were also revised.

Work has begun on the development of a direct labor standard for the Z Plant mechanical maintenance group. Use of the previously

a. Standards Program (Continued)

developed standards for instrument and electrical crafts in reporting performance will await the completion of the mechanical standard because of accounting procedures.

b. Work Simplification

The current Work Simplification sessions were completed with four conferences involving 76 man-hours of instruction for 19 supervisory roll conferees. As a result, new methods for four jobs were proposed by the Manufacturing Engineers' group, indicating potential annual savings of $30,700. Accomplishments of the supervisory group in Z Plant will be reported by the individual Sub-Sections.

c. Engineering Assistance

The study to determine the percent utilization of passenger-carrying vehicles by the Separations Section was completed, and a report was issued.

The program to provide temporary facilities for cleaning contaminated area vehicles at the 269-W Building was completed. The actual cleaning operation, which is being performed by the Transportation Section, was initiated.

A study of possible loss of process material to the sumps was made in the 231 Building. Recommendations for changes in the process equipment to preclude product loss was submitted to the Operations Sub-Section.

d. Property Management

The need for additional office space in the Redox and the 271-U Facility was resolved by the erection of Hauserman partitions in suitable locations. A request for space allocations in the 200 East Area for the Purex Contact Engineering group was resolved by reactivating the 2720-E Building (Patrol Headquarters).

The exteriors of seven buildings in the 200 East Area were brush painted, and asbestos cement siding applied to the 274-W Building in the 200 West Area during the month.

F. Significant Reports Issued

1. Routine

Number	Title	Author
HW-32025	Separations Section-Operations Sub-Section Monthly Report	V.R. Chapman

1. Routine (Continued)

Number	Title	Author
HW-32024	Separations Section-234-5 Operations Monthly Report	V.R. Chapman
Official Use Only	Separations Section-Plant Engineering Sub-Section Monthly Report	C.P. Cabell
HW-32045	Separations Section-Process Sub-Section Monthly Report	W.N. Mobley
HW-32044	Separations Section-Radiation Monitoring Sub-Section Monthly Report	A.R. Keene
Official Use Only	Separations Section-Power & Maintenance Sub-Section Monthly Report	R.T. Jessen
HW-31986	Separations Section-Mint Extraction Unit Monthly Report	O.V. Smiset
HW-31939	Monthly Progress Report, Plant Expansion Plant Engineering Sub-Section, Separations Section, May 1954	F.A. Hollenbach
HW-32016	Separations Section-Essential Materials	J.P. McBride
HW-31513	Separations Process Council Meeting	O.F. Beaulieu

2. Non-Routine

HW-31867	Standard Operating Procedures	O.V. Smiset
HW-31814	Basic Information for Direct Labor Standard, 231 Building - Revised, P. E. Report No. 8	R.S. Himmelright
None	Basic Information for Direct Labor Standard, Instrument and Electrical Groups, Z Plant, P. E. Report No. 117	R.S. Himmelright
None	Ratio Delay Study of Secretarial Activity in 2704-W and 2723-W Buildings, Work Simplification Report No. 3	W.P. Nicklason V.P. Madsen R.H. Silletto J.B. Young
None	Sampling and Sample Delivery for 221-U, Work Simplification Report No. 2	V.P. Madsen R.H. Silletto
HW-31789	Estimated Operating Costs for Disposal of TBP Wastes, P. E. Report No. 114	R.H. Silletto
None	Computation of Standard and Actual Charges for Process Analytical Services, P. E. Report No. 115	R.H. Silletto
None	Distribution of Landlord Steam Costs - 200 West Area, P. E. Report No. 116	W.P. Nicklason
None	Prevention of Loss of Material to the 231 Building Sump	W.A. Haney
None	Trip Report of Visit to Savannah River Plant and New York	F.A. Hollenbach
HW-31958	Trip Report Visit to Oak Ridge, Savannah River Plant, Knolls Atomic Power Laboratory, Mount Laboratory and Arco	A.R. Keene

2. Non-Routine (Continued)

Number	Title	Author
HW-31934	Radiation Incident Investigation, Class I, No. 360	W.G. Westover
HW-31768	Radiation Incident Investigation, Class II, No. 73	R.N. Donelson
HW-31673	Isolation and Metal Fabrication Improvement and Test Program Authorization	W.G. Browne
HW-31849	Measurement Precision in SF Materials Accounting - 200 Areas	W.N. Mobley
HW-27400	Determination of Fluoride in Plutonium Metals by Thorium Titration	W.S. Ferguson D.M. Newell

III PERSONNEL

A. Organization

There were no significant organizational changes in the Separations Section in May.

B. Force Summary

	Start of Month	End of Month	Net Change
General	5	5	0
Operations Sub-Section	613	611	-2
Power & Maintenance Sub-Section	567	592	25
Process Sub-Section	204	201	-3
Radiation Monitoring Sub-Section	75	76	1
Plant Engineering Sub-Section	27	27	0
Mint Extraction Unit	39	39	0
Section Total	1530	1551	21

C. Safety Experience

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

D. Radiation Experience

One Class II Radiation Incident (No. 73, HW-31768) occurred when a laboratory assistant received a localized exposure to the skin of 7 rads or less. This incident was caused by a small spot of contamination on the protective clothing, which showed a corrected exposure rate of 14 rads/hr including 1 r/hr. One Class I Radiation Incident (No. 360, HW-31934) occurred, and was caused by a pressure reversal in a process hood in the 234-5 Building which resulted in personnel exposure to airborne plutonium contamination.

D. Radiation Experience (Continued)

Stack emission, insofar as process sources were concerned, appeared to be generally well-controlled. The 4-5-L silver reactor at T Plant indicated reduced iodine-removal efficiency and was regenerated. A daily maximum of 2.2 curies I^{131} was discharged from T Plant, and the daily average was 0.5 curies. At the Redox Plant, iodine emission averaged 0.5 curies per day while the maximum daily emission rate was 0.9 curies. Ruthenium emission at the Redox Plant as measured at the 20' stack level, averaged 0.5 curies per day with a maximum daily rate of 3.6 curies. In spite of the apparently low stack emission rates, a narrow band of ground contamination, approximately 500 feet wide, was discovered extending in a northerly direction from the Redox stack. Isotopic analysis of this contamination indicated "older" material than is normally emitted from the Redox stack and the emission date and time had not been determined at the end of the month. It is postulated that the interior surfaces of the stack itself as well as associated process effluent gas piping and equipment are major sources of ruthenium particles. This will be thoroughly investigated.

E. Personnel Activities

1. G.E. Selection Program for Supervisors

Evaluation was completed for ten Power and Maintenance candidates.

2. Conference Leading Training

Seven Separations Section exempt personnel completed the one day training program offered by Training and Development instructors.

3. Report Writing Course

Seven exempt personnel completed training in the Report Writing Course offered by Technical Information on May 10 and 12.

4. Work Simplification Round Table

Nineteen Separations Section personnel completed the final 76 man-hours of training in work simplification methods.

5. Visitations

A. R. Keene visited ORNL, Savannah River Works, KAPL, Mound Laboratory, and the National Reactor Testing Station from April 24 to May 8 for consultation on Radiation Protection procedures in use at these various AEC installations.

W. H. Koontz visited Los Alamos Scientific Laboratory from April 24 to May 1 for design consultations and inspection of equipment for the Mint Extraction Process.

5. Visitations (Continued)

K. H. Hammill visited KAPL and the Brookhaven National Laboratory from May 24 to 28 for consultations on analytical equipment and procedures and to present a technical paper at the BNL Third Annual Conference on Radiation Laboratories and Equipment.

ENGINEERING DEPARTMENT

MAY 1954

TECHNICAL SECTION

In spite of the limitations as regular production tools of the two eddy current instruments which have been under development, the MIZ-1 Al-Si penetration detector and the MIZ-2 crack and inclusion detector, these instruments were prepared for possible production this month. In the case of MIZ-2, it is felt that the ability of this device to select out cracked slugs and slugs with inclusions, whether or not these defects appear on the surface, would make its use profitable in reducing the incidence of split ruptures even if it could be used on only a portion of the material throughput. Use of MIZ-1 on a large portion of the throughput is conceived as a preventive measure against a higher incidence of side wall failures after a summer of high inlet water temperatures and consequent increased corrosion rates.

Regular production canned slugs having sealed anodized films were exposed to 120°C pile water for 14 days with no apparent destruction of the protective films. Similar samples have lasted over 50 days in 90°C pile water. This is much greater corrosion resistance than heretofore obtained with various types of anodized films. A production test of these anodized surface slugs is being arranged. Conceivably this anodizing can have a significant effect on reducing these slug failures resulting from corrosion of the can.

A four-inch slug cut from Hanford cast uranium-silicon alloy rod, rolled and heat treated at Fernald, was tested in cyclic thermal strain in the woodsplitter. The power input was sufficient to transform a large central core into the beta phase. After 75 cycles the slug had increased in length by approximately 2 mils with no change in diameter. Sectioning showed no evidence of crack formation as was evidenced in the chromium alloy piece previously tested. Additional tests will be performed on this alloy to explore this rather remarkable behavior further.

The feasibility of the uniskanning process for fabrication of slug sweaters and cans was investigated. Several zircalloy 2 sweaters of 0.003" to 0.004" in wall thickness and 9 inches in length were produced experimentally.

During the month, all piles were limited by outlet water temperature of 95°C. At month end, a revised specification was issued to permit outlet temperatures of 105°C as soon as operating methods and basis for relieving the trip-before-boiling limit can be revised. Maximum allowable helium concentrations in the reactor gas were increased as a result of production test results at D Pile.

Eighteen normal uranium slug failures occurred during the month. Fifteen of these were eight-inch, lead-dip canned pieces charged under PT-313-105-25M. Some of the metal was Hanford recast material.

The exposure of hot-press J-N slugs at C Pile has attained without rupture. Tubes discharged at about this point show no evidence of

serious corrosion attack.

Boiling expriments in the process tube mock-up are continuing and are presently being extended to about 500 psi pressure. Modifications to the facility to permit operation at 800 psi are continuing.

Redox plant performance was satisfactory with respect to decontamination and production rates which were satisfied despite development of a leak in the oxidizer (H-4) coil and a failed 1AF control valve. Dual scrub operation of the second uranium cycle extraction column (2D) was tested--no effect upon decontamination or waste loss was observed. The silica gel treatment of product uranium for removal of residual zirconium and niobium was demonstrated with the recently installed temporary test unit which reduced the activity of the product from 600 percent to 240 percent gamma (aged material uranium = 100 percent). No breakthrough of Zr-Nb was registered after 144 bed volumes of throughput. Emission of ruthenium or iodine activity, as measured by stack monitors, was less than 1.0 curie/day on the average with a high value of 3.6 curies of Ru/day on May 25. This occurred after failure of the oxidizer coil and is attributed to less than normal reflux in the oxidizer (H-4).

Waste Metal Recovery plant operations continued the excellent performance established in April with a new high in waste removal rate for a seven day period of 167 percent of plant design capacity and a monthly throughput to solvent extraction of 153 percent of design capacity. Rework operations rose to 4.1 percent which is attributed to difficulties with the feed pump system serving the extractions column rather than process difficulty. As much as 20 percent of the feed on occasion was young material (31 to 40 months since pile discharge). The attainment of product specifications appears limited by ruthenium for which an average dF of 3.5 is attained. Hence, any further increase in the proportions of young material, particularly with increased MWD/T history, appears unlikely. Conversion of UNH to UO_3 was satisfactory relative to production and quality. Attempts were made to produce high reactivity material (1.3 to 1.4 vs. 1.0 per normal procedures) via the addition of sulfur containing compounds to the pots; however, caking problems in the calciners were incurred under all conditions investigated. Production via the recently installed gas fired Luckey pots was limited to five percent of total production since the process vent system appears to be overloaded when the Luckey pots are operated. Other than this secondary problem, the gas fired pots perform adequately from a process viewpoint.

Laboratory studies employing normal uranium spiked with Ru^{106} have disclosed a rapid reduction of voltaile ruthenium tetroxide to non-volatile ruthenium dioxide in the presence of water vapor and a metallic element; the reduction is inhibitied by absence of water vapor or metallic surfaces. Removal of ruthenium from the product stream rather than the feed stream appears possible through the use of ozone (2 percent O_3 in air) in countercurrent flow to the product uranium stream. Decontamination (factor of 3 to 10) from ruthenium also is achieved during the conversion of uranyl nitrate hexahydrate (UNH) to uranium oxide (UO_3). These two avenues are being explored as replacements for the current "head-end" volatilization proce-

dure.

It appears possible to increase the total pile exposure yielding a given Pu-240 content by about 20% if the temperature of the graphite is reduced from about 425°C to about 275°C by use of helium gas. Any graphite damage induced at this reduced temperature could presumably be eliminated by periodically raising the temperature to 425°C and annealing for a number of hours. This preduction is based on analysis of the most recent values of σ_c 49 σ_f 25 vs. neutron energy.

Values for the ratios of fission cross sections of U-235 and Pu-239 have been obtained in the region of 0.005 ev. These are believed to be the most reliable values in existence for this low energy range.

It is hoped to employ aluminum from jacket dissolution as a salting agent in the Purex extraction column and thereby reduce nitric acid requirements to the point that acid recovery will be unnecessary. Batch countercurrent runs employing such a system have given favorable results, the nitric acid in the waste being less than that scheduled for throw-away employing the standard flowsheet with an acid recovery operation.

The light scattering microphotometer under test at H Area for control of turbidity of alum-treated pile water has given excellent results. Incipient filter break-through conditions are indicated, permitting corrective action in advance with maximum economy of chemical treatment. During six weeks at H Pile no pile scrams resulted from tube pressure build-up and pressure drops have been extremely constant.

A major improvement in mass spectrometer technique has greatly implemented the plutonium isotopes separation program. Analytical precisions for Pu-239, -240 and -241 determinations are now ±0.2, ±0.2, and ±0.03 and still further improvements are expected.

Two zircalloy-2 specimens have been exposed for two months to a 10% He-90% CO_2 environment in a dry process channel at F Pile. The temperature is believed to exceed 600°C. Brief visual examination indicated a surprisingly small degree of gaseous corrosion in comparison with the results of out-of-pile tests in air at similar temperatures.

In connection with the development of a long-exposure matrix-type slug, uranium fragments cast in pure magnesium and in an alloy of Mg-1.4% Si have been corrosion tested in water for 24-hour periods. The pure magnesium specimen was swollen, but corrosion of the Mg-Si specimen was limited to the surface uranium, microscopic examination indicating the presence of a protective layer preventing penetration of water into the interior of the specimen.

DESIGN SECTION

Design Section effort for the month was distributed approximately 30% to Expansion Program activities, 14% to Reactor Plant Modification for Increased Production, 31% to Research and Development and 25% to other

projects and design orders. This reflects very little change from the April work load with a slight increase in R & D effort and a corresponding decrease in other design projects.

Authorization was received to proceed with revisions to the condenser design for the Purex Tank Farm, Project CA-513. The first phase of design, which involves revising existing construction drawings to eliminate present surface condenser installation from the construction contract, is 90% complete. Preparation of new plans and specifications for the contact condenser installation is 3% complete. Design of the new installation is being performed on a high priority basis and is scheduled for completion August 10, 1954.

Design of the Purex Nitric Acid Fractionator, which was initiated during the month, following scope approval, was halted temporarily pending decision as to possible design and fabricate contract for the equipment. Design of the building and associated piping would be performed upon receipt of vendor designs for the equipment.

Design effort on CA-514 was expedited in order to complete major elements of the 313 Building during the month. Total design is 95% complete, an advance of 5%. Design of the 313 Building structure and equipment is approximately 97% complete.

Preliminary authorization was received for the initiation of detailed design for CG-587, TBP Waste Scavenging and CG-588, Redox Ammonia Scrubbers. Design for both projects is proceeding on a priority basis and project proposals are being prepared.

Total design for CG-558, Reactor Plant Modification for Increased Production advanced to 18.2%, an increase of 2.6% during May. Design Scope is now 74% complete. Total design progress reflects a re-evaluation from last month's design schedule caused by the addition of shop drawings for prefabricated piping. Design is continuing on an interim authorization basis pending authorization of total design funds.

Design completion of the Hot Semi-Works Self-Concentrator and the Redox Oxidizer Off-Gas Treatment System was advanced to 80% and 75%, respectively, during the month.

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	53%	40%
CA-512	100-K Area Facilities		
	KW - Water Plant	99	91
	Reactor & Bldg.	93	78
	KE - Water Plant	82	66
	Reactor & Bldg.	65	66
	General Facilities	90	81.8

Project No.	Title	Scheduled Completion	Actual Completion
CA-513-A	Purex Facility, Part "A"	41%	40%
	Part "D"	38	42
CA-514	300 Area Expansion	40	34
CG-535	Redox Capacity Increase, Phase II	58	44
CA-539	Redox 241-SX Tank Farm	98	98
CA-546	Fuel Element Pilot Plant	12	11
CG-573	Hanford 3X Program - 300 Area		70*

* Work now authorized, which is a pprtion of the proposed project.

The local Building Trades Council called a work stoppage by all construction craftsmen on May 5, 1954, as a protest against the presence of Cisco Construction Company, a non-union contractor. On May 7 the AEC stopped work being performed by Cisco on the 151-KW and KE substations and the Recuplex CAW Facility, and the construction craftsmen returned to work.

On the Purex project, the turnover of welder-plumber personnel was exceedingly high during the latter part of May. This resulted from a division of present forces into a three-shift operation. If this trend continues, or if replacement is difficult, the Purex project could be seriously delayed.

Packing of graphite in 105-KE Reactor was accomplished within 24 shifts between May 11 and May 19, 1954. (This set a new plant record for packing graphite reactors, as compared with the previous record of 39½ shifts for 105-C.) All process tubes have been installed; the top cast iron shield has been placed; and good progress was made on other installations at 105-KE. Diffusion tests were completed on May 23, and other major acceptance tests were in progress. The top skin plate at 105-KW was placed. Piping was being flushed and cleaned, and grouting on top of the 105-KW unit was essentially completed.

The construction contractor has revised his schedules on Purex Production Facility to extend the completion date from December 31, 1954, to February 1, 1955. Procurement was essentially completed for construction and for miscellaneous operating and maintenance equipment. In the 202-A Building, about 4200 cubic yards of concrete were added, and concrete block work at the east end was completed through the ninth lift. Installation of kickplates was slightly over 50% complete. Welding in the Hot Pipe Trench proceeded slowly to about 13% complete; 290 welds have been accepted. Erection of structural steel in the Service Section was compoleted by the subcontractor, and installation of built-up roofing has started. Painting with Amercoat proceeded in the Sample Gallery and Laboratory Section. Electrical and instrumentation work progressed satisfactorily, and installation of elevators in Aqueous Make-Up and Product Removal Sections was about 50% complete.

ORGANIZATION & PERSONNEL

Total on Roll, May 1, 1954	1,500
Accessions	20
Separations	21
Total on Roll, May 31, 1954	1,499

A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

ENGINEERING ADMINISTRATION SUB-SECTION

MAY 1954

An invitation has been received from the ANP Project to attend the first annual joint Security-Document Control Conference of the Atomic Products Division. The meeting will be in Cincinnati, June 15-16. Arrangements have been completed to send two representatives from the Technical Information Unit.

During the month a number of forward steps were taken to assure that a reference copy of all incoming reports was set aside for Classified Files. This will greatly improve the service to personnel who come to the Files' counter with a list of references. One copy of all incoming reports (unless the reports are specifically designated for someone at Hanford) is marked for Files reference use. Requests by personnel for reports from offsite are automatically increased by one copy for the Files. Further, in order to reduce the number of false leads in the Bi-Weekly List, those documents which are in short supply or for which circulating copies are not available will be so indicated. Finally a position of Document Reserve Clerk has been created and filled. This clerk will be responsible for handling all pending requests for documents. Her duties will consist of (1) following up and requesting return to Files of all documents which have been reserved and (2) ordering from offsite requested documents not in the Classified Files collection.

During the month the following major contract activities were handled:

1. The original contemplated and revised Modification No. 5 to Special Agreement No. G-12 has been withdrawn and will not be issued, and the original subject matter of said modification will be incorporated in the final close-out of the contract when all negotiations are completed.

2. Modification No. 3 to Consultant Agreement No. 114 between General Electric and Dr. M. E. Ensminger covering an extension of time of the agreement was executed by Dr. Ensminger May 20.

3. Modification No. 1 to Special Agreement No. G-38 between General Electric and Morgan Wheeler and Co. and Hugh H. Russell covering additional appraisal services and extension of time was executed by the appraisers May 20. Modification No. 2 to Special Agreement No. G-38 between General Electric and Morgan Wheeler and Co. and Hugh H. Russell covering additional appraisal services and extension of time was negotiated and prepared during May and is now being processed for execution. All components of the modification have been accorded prior approval by the Commission.

4. Sale Agreement No. S-1 which constitutes a bill of sale conveying damaged telephone cable to Universal Underwriter's Agency Incorporated was executed by General Electric May 24 and forwarded to the Commission for approval May 25.

5. Upon advice of counsel, it was decided to proceed no further with the preparation of a contract for street striping and painting because of possible coverage of the proposed work by the Davis-Bacon Act. The work will either be performed by General Electric forces or a contract will be prepared by the AEC.

6. Modification No. 1 to Consultant Agreement No. 121 between General Electric Company and Haughton Elevator Company providing for additional work and extension of time was executed by the Contractor May 17.

7. Consultant Agreement No. 122 between General Electric and Stanford Research Institution providing for the consulting services of Dr. Steffins in the field of study of the mechanism of fuel element failures was executed by the Contractor May 19.

8. Consultant Agreement No. 123 between General Electric Company and Applied Research Laboratories of Glendale, California, covering quantometric analyses of isotope samples to be furnished by General Electric was transmitted to AEC for approval May 21.

[redacted]

PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

MAY - 1954

RESTRICTED DATA

This document contains restricted data as defined in the Atomic Energy Act of 1946. Its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

VISITORS AND BUSINESS TRIPS

J. C. Johannesen and G. E. Wade visited Phillips Petroleum Company, Idaho Falls, Idaho, May 11 through 14, for consultations regarding the slug testing facility.

W. L. Bunch and R. L. Tomlinson went to Knolls Atomic Power Laboratory and West Milton Site in Schenectady, New York, May 13 and 14, to present papers at the Shielding Information Meeting.

L. W. Lang visited Argonne National Laboratory, Lemont, Illinois, May 24 and 25, for technical consultations on the analysis of irradiated materials and to discuss the Argonne fuel program.

C. A. Lund and R. E. Woodley visited Phillips Petroleum Company, Idaho Falls, Idaho, May 27 and 28, to submit a proposed irradiation program, discuss sample carrier design, availability of irradiation facilities, feasibility of planned experiment arrangement, and experimental conditions in canal facility, both past and present.

R. S. Paul, G. E. Wade, and M. R. Wood visited Phillips Petroleum Company, Idaho Falls, Idaho, May 27, for the installation of GEH-4.

L. P. Bupp, P. H. Reinker, and R. B. Richards visited Knolls Atomic Power Laboratory, Schenectady, New York, May 3 and 4, to discuss reactor operation and control.

ORGANIZATION AND PERSONNEL

	April	May
Administrative	5	5
Pile Engineering	72	77
Pile Development	62	65
Special Irradiations	23	24
Technical Liaison	4	4
Total	166	175

Administrative: One Technical Graduate was deactivated to enter military service, and one Technical Graduate - Rotational was reactivated from military service.

Pile Development: One Junior Engineer, one Engineer II, and one Senior Engineer transferred in from Separations Technology Sub-Section, one Engineer II was hired, and one Chemist terminated.

Pile Engineering: One Engineer I and one Counting Room Assistant D were hired, two Technical Graduates - Rotational were transferred in from Applied Research Sub-Section, one Engineer II transferred in from Separations Technology Sub-Section, and one Engineer II was reassigned to Special Irradiations.

Special Irradiations: One Engineer II was assigned to Special Irradiations from Pile Engineering.

PROCESS TECHNOLOGY

Power Level Limits

During May the piles were limited primarily by outlet water temperature determined by slug corrosion effects, until approval of a revised specification which authorizes 105 C tube outlet temperatures. As a first step toward obtaining maximum levels, B, D, F, and H Piles will be operated at 95 C tube outlet temperature. Further increases in levels will become possible as methods are devised for operation when limited by tube flow monitoring under trip before boiling conditions. DR Pile will continue to operate at 90 C tube outlet and C will operate with a 925 KW/tube limit.

Process Changes

Four Process Specifications - Reactor Process, were revised and approved this month. The approval of revised Specification 15.00,"Process Tube Outlet Water Temperature", eliminated the 90 C slug corrosion limit and imposed a 105 C tube corrosion limit. New slug corrosion limits, contained in Specification 26.00, "Slug Rupture Limits", have not yet been approved as this specification is circulating for approval. Specification 17.00, "Can-End Temperature Limits", has been deleted. The approval of Specification 31.00, "Composition of the Reactor Gas", authorizes increases in the per cent helium when maximum graphite temperatures are in the 480 to 500 C temperature range. The maximum per cent helium has been increased from 30 to 40 at B, D, and F Piles, from 40 to 50 at DR, and from 30 to 50 at H. Revised Specification 55.00, "Rate of Control Rod Withdrawal During Startup", requires the vertical rods to be withdrawn in groups of three for certain cold startups when the reactivity of the pile may not be accurately known. Horizontal rod withdrawal procedures were revised to allow for the reduction of the metal coefficient when "J" type loadings are charged. The maximum allowable power rise rate after a cold startup was increased from ten to twenty-five megawatts per minute. The maximum power decrease rate when an emergency does not exist has been increased from ten to twenty-five megawatts per minute by the approval of Specification 58.00, "Reactor Shutdowns".

Six other Process Specifications are circulating for approval.

Slug Rupture Experience for May

Eighteen normal uranium slug failures occurred during the month. One of these was a side failure of a Group 11 metal piece, one was a cleavage failure of a Group 8 metal piece, and one was a side failure of a glue-coated Group 12 metal piece charged in a reduced-flow C Pile tube under PT 105-519-E. The other fifteen failures occurred in eight-inch, lead-dip canned, pieces charged under PT 313-105-25-M. Of the PT 25-M failures, five were cap failures, one was split, one was non-classified, and the other eight have not yet been inspected. Nine of the fifteen failures of PT 25-M metal occurred at exposures well above 600 MWD/T.

Irradiation Behavior of Lead Dipped Slugs

Rupture Rate - At areas where there are sufficient data to furnish a comparison, the rupture rate of the 25-M metal is approximately four times the recent rate for eight-inch, triple-dip canned metal. Most of the ruptured 25M pieces were manufactured from Hanford recast metal.

Slug Warping - Two stuck charges occurred at B Pile and one at D in 25-M metal. Two occurred at D in 7-M metal. Inspection of one tube of 25-M and one of 7-M at D Pile showed several noticable warped pieces. The other charges were mixed with normal material and could not be inspected.

Failure of Non-Uranium Loadings

One cap failure occurred in a "C" metal enrichment piece at C Pile.

Irradiation of New Fuel Slugs

Cored Slugs - Production Test 105-570-A - A production test authorization is circulating for approval signatures to irradiate to failure four tubes of cored uranium slugs and four control tubes of normal uranium. Two pairs are to be irradiated at high tube powers and two at low.

Mechanically Bonded Slugs - Production Test 105-575-A - A production test authorization to irradiate four mechanically bonded slugs was prepared in rough draft form.

Investigation of Rupture Mechanism

Production Test 105-566-A, "Effect of Thermal Cycling on Slug Failure Incidence" - The enriched uranium "Ike" slugs charged at H Pile for the thermal cycling test have been operating for approximately one and one-half months and have been subjected to approximately three-hundred cycles. The enriched pieces have operated at a maximum calculated power of 30 KW per foot of uranium, with the calculated core temperature being cycled between approximately 200 and 300 C.

Manufacture of Other Products

Production Test 105-551-A, "High Exposure Thorium" - As the exposure of thorium pieces proceeds, heat generation per slug increases because of the formation of fissionable U-233. This test authorizes the exposure of thorium flattening columns to exposures up to 3000 MWD/AT to obtain data on the rate of heat generation. Present data show 20% of the uranium rate at 1000 MWD/AT and 27% at 1500 MWD/AT.

Production Test 105-567-A, "Preliminary Irradiations of J-Q Columns" - Thirteen tubes containing 19 alternate J and thorium pieces were charged at H Pile on 3-14-54. The test has proceeded without incident.

Production Test 105-562-A, "P-10 Irradiation at C Pile" - The choice of piles to be used for any future P-10 production will depend on the ability of the fuel and target slugs to operate successfully at high tube powers. This is being investigated at C Pile in the central zone. Sixty tubes have operated since the middle of February. Forty contain hot-pressed fuel slugs, the balance being cold-canned or Al-Si canned. The maximum current tube exposure is . Three tubes were discharged after two months' exposure and showed no unusual slug corrosion. Two of these tubes were hot press canned and one was cold canned.

Pile Studies

Use of Enriched Uranium for P-10 or U-233 Production - The economic and technical feasibility of using enriched uranium as a substitute for U-235 alloy fuel pieces in tritium or U-233 production is being analyzed.

[redacted]

Substitution of Thoria for Thorium in Target Slugs - The possibility of using thoria instead of thorium metal in production of U-233 is being studied with the assistance of other technical groups, and the report has been completed to rough draft form. Cost savings are not apparent for thoria and fuel slug loadings because of probable failure during irradiation of the thoria slugs. Advantages, however, appear possible through the use of a compound slug containing thoria pellets in a J matrix.

PILE PHYSICS

Pile Safety Studies

A comparison of operating characteristics and nuclear hazards of various pile loadings was presented at a Reactor Safeguard Committee meeting at Hanford on May 13 and 14. The present status of the DR P-10 loading, which closely approaches the reactivity properties and operating characteristics of a fully enriched pile, and the measures which have been taken through tighter operating specifications and procedures were explained.

A study to more closely predict the sequence of events leading to and following a pile disaster is being coordinated with studies and experimental work of other Pile Engineering Sub-Units relating to the mechanical and reactivity effects resulting from water loss and subsequent heating. Results from the dry pile temperature coefficient test planned for the KE Pile startup will have an important bearing on such studies.

Rate of Rod Withdrawal

A study is underway to solve the pile kinetic equations when the excess reactivity is a linear function of time. The present VSR withdrawal rate procedure limits the gain in reactivity to approximately 10 inhours per second. Step function calculations which have been used as a basis for specifying this procedure do not include the effect of the delayed neutrons; a more exact solution of the problem is therefore quite desirable. This problem is also of interest in ascertaining safe horizontal rod withdrawal rates during a hot startup.

Scram Transient Studies

In connection with the scram transient measurements being carried out in the C and D Piles, calculations have been made to determine the flux level as a function of both time and location following a scram. The simple case of a critical slab reactor which is scrammed by switching on an opaque control sheet at the center of the slab has been calculated assuming a single group of delayed neutrons. Results indicate that the initial drop in flux level which occurs before the delayed neutron effects become important is rather sensitive to the location at which the measurement is made. At 1/10 of the distance from the sheet control to the reactor edge the flux drops to $\sim$6% of the initial level in one second whereas at 9/10 of the distance to the reactor edge the flux has a value after one second of $\sim$18% of its initial level.

Both side-hole and under-pile chambers are being used in the C Pile measurements in order to ascertain the severity of the above-calculated effect under conditions where control elements are dispersed. The first such measurements in the C Pile were made on May 20, but side-hole chamber re-positioning will be required to insure good results.

Specification of Product Quality

The problem of the spontaneous fission rate of pile-produced plutonium as a function of pile exposure has been re-examined for the purpose of recommending suitable tube exposure limits to correspond to the present maximum neutron emission rates acceptable to the AEC. Conclusions reached were essentially that the exposure level for low exposure metal should not exceed 220 MWD/ton whereas concentrations as high as 1100 MWD/ton would be acceptable for high exposure material. The arithmetic average exposure of barely acceptable low concentration material with the probable spread in discharge concentration would correspond more closely to 210 MWD/ton, whereas the arithmetic and weighted averages of the high exposure material would be very close. Recommendations of these results as the basis for process specifications are given in HW-31952.

Specification of J-Slug Handling Limits

The basis for changing current specifications on the handling of enriched material is given in HW-31690. Relaxation would be permitted in the discharge operation to allow storage of as many as 80 J slugs in a bucket with sufficient reflector separation rather than the previous 66, and to allow that number to accumulate in the discharge pit provided not more than eight natural uranium slugs were also present.

Long Term Reactivity Studies - PT 105-553-A

Daily readings of inlet and exit water temperatures and panellit and cross-header pressures are being recorded for each of the six tubes charged under this production test in F Pile on 4-25-54 and for their surrounding tubes. All of these tubes are operating in the range from 450 to 520 KW. Reactivity changes are to be determined by before-and-after test pile measurements on individual slugs over the range from 0 to 2000 MWD/AT.

Shielding Information Meeting

Two papers were presented at the semi-annual AEC Shielding Information meeting held at KAPL on May 13 and 14 covering the gamma and neutron attenuation measurements made during the past three years at Hanford. The text of these talks is contained in HW-31729. This work was largely directed toward evaluating the effectiveness of the high density concretes which have been used in the K Pile shields and the C Pile top shield.

Simulated Shield Burnout Test - DT 105-548-A

Outer cycle data from the first three steps of the simulated masonite burnout test have been plotted to show the trend of thermal flux increase with masonite removal. Whereas the first two steps, consisting of the removal of 1/4 and 1/8 respectively of the total masonite, each caused a thermal neutron flux increase of approximately a factor of ten, the third step, consisting of removal of another 1/8 of the masonite, caused an incremental increase in leakage of a factor of greater than 100 bringing the total increase to the order of 10^4. A fourth step in the experiment is currently under irradiation.

C Pile Bulk Shield Facility Calibration - DT 105-546-A

Data from the calibration of this facility indicate a thermal neutron flux of approximately 10^9 neutrons/cm^2/sec available at the front of the crate with a six inch thermal shield in place. No marked streaming of neutrons was observed, although slight streaming was noticeable at the edges of the outer shielding blocks.

Measurement of P^{32} Self-Absorption - DT 105-555-A

Following irradiation of sulfur in the Y test facility as authorized by this test, a series of P^{32} sources have been made in the form of elastomer disks. By varying the weights of sulfur from 0.1 to 1.6 grams per disk, the self-absorption characteristics of this material used in the detection of fast neutrons may be determined empirically.

HEAT TRANSFER

Cooling-by-Boiling Studies

Efforts are continually being made to correlate burnout flow rates with pressure, specific heat generation, density of the fluid, inlet temperatures and other variables. However, these efforts have proved inadequate, and they tend to re-emphasize the need for further experimental data on the cooling-by-boiling process.

Piping modifications were made to the tube mock-up which should permit experimental studies at 500 psig rear header pressures. These studies will be started within a few days in order to supplement the tests which have already been made at 100 and 250 psig.

Major Equipment Modifications

Several additional requisitions were prepared for the procurement of parts which will be necessary to modify the tube mock-up to withstand very high pressures. It is believed that the major portion of the design effort is completed, although many details remain to be handled.

A nickel heater tube which will permit 750 KW heat generation in the form of cosine has been recieved. At present, the tube is composed of several parts; following welding, it will be put into use for cooling-by-boiling tests.

Bids have been requested on several additional heater tubes of various sizes and on special process tubes. However, the prospective vendors are encountering difficulties in determining methods to manufacture them, and this, of course, is leading to delays in procurement.

Delays are also being encountered in procurement of the new, supplementary generator. It was recently believed that the generator might be in use by September 1; it now appears that October 15 or later is a more likely date.

Pile Panellit Trip Limits

Experimental data on the full scale tube mock-up have indicated that the present method of establishing tube Δt limits based on trip settings may be overly conservative. Basically, the data indicate that greater flow reductions than presently

-llowed may be withstood without the loss of cooling in the tube. Additional data ɜre obtained on the mock-up during the month, and all these data are presently being analyzed to determine whether the present permissible tube Δt's can be safely relaxed.

A report on various aspects of boiling in an existing process tube, HW-31649, R.F. Recht, 4-28-54, was issued. Its purposes were to explain some of the basic principles of such boiling and to present information on causes leading to the establishment of boiling.

High Pressure Loop at H Pile

A report evaluating several aspects of safety associated with the operation of the subject loop was issued as "Safety Considerations of H Pile High Pressure, Non-Boiling Loop", K.G. Toyoda, HW-31759, 5-6-54.

General Safety Studies

A series of calculations were made to determine pile heating effects following loss of cooling for both natural uranium and P-10 loadings. Elapsed time between water loss and pile shutdown was considered, and information on when slug jackets and slugs would melt and on when slugs would vaporize was derived. This information was presented to the Reactor Safeguard Committee during its inspection here.

To support calculations of the type above, exploratory tests were conducted on ʰhe full scale tube mock-up to determine the approximate time required for water ɔ escape from a tube following riser failure. Test conditions prior to simulated riser failure were 600 KW uniform tube power, 12 to 17 psig rear header pressure, H process tube assembly and two different outlet water temperatures - 90 C and 120 C. The data implied (but did not indicate directly) that about 2 seconds would be required before start of ejection of water from the tube due to steam formation for the case of equilibrium 90 C outlet temperature. Likewise, they implied that water was being ejected (and probably most of the water had been ejected) from the 120 C tube in about 1.5 seconds. While further tests and analysis are required to reach firm conclusions, it is believed that these results are moderately applicable to pile tube cases.

At the request of Process Sub-Section personnel, calculations were made to determine minimum cross-header pressures required for cooling DR Pile during shutdown. It is expected that these pressures will be used during J tube discharge in order to minimize the possibility of slugs being washed from a tube when the outlet nozzle end cap is removed.

Old equations are being reviewed and new ones are being derived to permit calculation of the time water may be shut off from tubes or cross-headers during pile shutdown. Such calculations are needed in particular to establish K Pile specifications.

Hydraulics Laboratory Studies

Tests were conducted which showed that cavitational-type flow of a potentially ɔre serious nature than that previously observed could exist in the B, D, F outlet Parker fittings. Such conditions would be present at combined conditions of

30 - 40 gpm flow rates, outlet temperatures of 90 C or above and rear cross header pressures of 10 - 25 psig. The potentially serious aspect arises from the fact that this flow causes added vibration of the piping. The degree of seriousness of this vibration is presently under investigation.

Data have been taken and a report on the flow-pressure drop characteristics of K Pile tubes is being readied for issuance.

The Hydraulics Laboratory in 189-D is essentially complete and acceptance tests will be made in a matter of days.

In-Pile Slug Tests

The thermocouple slug which failed on 4-15-54 was examined and found to be split longitudinally down its entire length. The thermocouple portion of the assembly was found to be in good shape even though the slug had received about 90% of the exposure which the central slug in a 600 MWD/T tube receives. Analysis of data from the slug is in progress, and an appreciable increase in uranium thermal conductivity with exposure is indicated. However, this apparent conductivity increase is hard to believe and the analysis is continuing.

Laboratory Tests on Fuel Elements

Data were reported here last month on the conductance values of various bonds. Further analysis has indicated, however, that the reported values may have been conservatively low - especially for the cold pressed bond. Thus, the reported data should be considered as tentative until further verification.

Fuel Element Calculations

A report of the effect on maximum uranium temperature of inserting a beryllium core in a hollow uranium slug was issued as HW-31836, W.F. Ekern, 5-13-54. It was found that the beryllium core would reduce the temperature some but not a large amount.

An analysis of slug jacket temperatures in tube 0961-H was made and the results were reported to appropriate people. This tube is part of the high pressure, recirculation loop.

"Heat Transfer Aspects of the Design of Off-Site Shipping Casks for J Slugs," S.R. Fields, HW-31902, 5-20-54, was issued. Its purpose is to aid in the design of shipping casks for J slugs.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

Detailed liaison with Manufacturing and Design Section personnel has continued in developing the criteria and specifications for the gamma spectrometer slug rupture detection systems to be installed at all piles except KE and KW under project CG-578 and 579. The final specifications for the spectrometer units have been prepared in draft form and the final design on the turret assembly has been circulated for comment.

The prototype gamma monitor at H Pile continued to operate satisfactorily; it has operated well in excess of a year and has amply demonstrated the sensitivity, stability, and maintenance-free operation which was expected. In the case of a recent rupture at H Pile the prototype gamma system signal increased about 400% and continued with this large signal for six hours until water was detected in the pile and the pile shutdown with a severe rupture and water leak; this without indication from the beta monitoring system. It appears that the water leak did not develop until about four hours after the rupture was detected by the gamma system. The prototype system is being wired into the control room and will be used by Operations as a primary rupture detector for those cross headers it monitors. A continuing signal has also been observed on cross header #5; at the last shutdown five tubes containing "C" aluminum-U-235 alloy slugs were found to contain rupture suspects.

The portable scintillation detector developed to provide a ten-fold sensitivity increase in isolating tubes has been demonstrated. It is now being redesigned to provide a more compact unit which can be utilized more effectively in the field.

The slug rupture detector designed for the fuel element irradiation facility at the Materials Testing Reactor has been shipped for installation. An operating and service manual for use by the MTR personnel has been prepared in draft form.

Measurement of Neutron Diffusion Length in KE Pile

The diffusion length of thermal neutrons in the KE Pile graphite "as stacked", i.e., including process tubes and voids, was measured to be 51.3 centimeters; this value is extracted from a graphical analysis and average of 464 independent diffusion lengths which were the total measured about eight positions of the neutron source in the pile. This tentative value for the diffusion length - it will be firmed through IBM analysis of the data - is to be compared with 51.6 centimeters measured at KW Pile. The slightly lower value is expected as a result of the increased graphite density in KE Pile and both values are now found to agree with calculations. The data from both piles will be corrected to "solid stack" conditions, compared with results from similar measurements on other piles, and compiled in a formal report.

The data were calculated and analyzed as they were obtained in order to isolate local regions containing concentrated impurities if they existed. No evidence of either significant localized or gross contamination was found. Numerous refinements in instrumentation were reflected in a smooth running and almost entirely maintenance-free operation.

Neutron Economy Studies

A report was issued, HW-31739, "Reactivity and Conversion Ratio in J-N Loadings," M.V. Davis - W.E. Niemuth, describing work to date in determining the conversion ratio and reactivity of various pile loadings designed for tritium production. In summary the atomwise efficiency of converting U-235 to tritium in a J-N loading of the H-10 type is 0.67 and the lattice reactivity, K_∞, is 1.065. In the modified load, i.e., using 3.8" target slugs, the conversion efficiency is calculated to be 0.63 and K_∞ is 1.08. Similar techniques were employed to arrive at an initial cold, clean conversion ratio of 0.61 atoms of U-233 per atom of U-235 depleted in a loading employing eight inch J slugs and six inch thorium slugs.

Measured neutron distributions in enriched uranium "E metal", i.e. enriched to 1.75% U-235, and thorium have been used to obtain an initial cold, clean conversion ratio for an E-thorium loading. In the case of a 6.68" thorium slug coupled with 12.25" of E metal (approximately the correct length ratios for such a loading) a conversion ratio of 0.77 obtains. This includes plutonium as well as U-233 and in about the atomwise ratio of 10 to 9.

A measurement of the power generation in enriched uranium (E metal) compared with natural uranium was made in the Test pile through integrating measured neutron distributions. The measured factor by which the power generation in E metal exceeds that in natural uranium is 1.85 - in quite good agreement with a factor of 1.8 calculated by R.O. Gumprecht. The measurements are now being extended to determine the extent to which an E metal column may increase the power output of surrounding natural uranium columns. These data are important in interpreting both the heat transfer and metallurgical aspects of the "E" metal irradiations.

A measurement of the cadmium ratio for gold detectors at the surface of dry uranium slugs and water cooled uranium slugs (C Pile annulus) indicates that the difference in the two cases is quite small.

Instrument Development

Components for a sub-critical neutron monitor are being procured to permit a determination of the feasibility of incorporating this type of instrumentation into the Hanford safety systems. The system will consist of a U-235 fission chamber with quite standard associated electronics. Such a system is expected to respond significantly to a flux of less than 10^2 neutrons cm^{-2} sec^{-1} in the presence of 10^5 R/hr of gamma radiation. The electronics of this system have been requisitioned with delivery promised in June. The U-235 coated electrodes have been requisitioned from Oak Ridge and these components are presently scheduled for July delivery. The initial on-pile tests are scheduled to start in September. Design is proceeding on a mechanism to remove this low flux chamber from the pile after the low level phases of startup have been accomplished.

Development and modification of the low level "rate-of-rise" trip monitor is proceeding. The present effort is directed toward minimizing the possibility of a scram from pile periods appreciably longer than the selected maximum scram period.

Continuing attention has been given the development of a remotely operated "probe" which will locate highly radioactive sources remotely and quickly. Such a probe could be used to direct a television camera in efforts to locate and remove slugs lodged on the rear face, for example. A probe employing a small scintillating crystal coupled to a photomultiplier tube through a long light pipe has been designed and fabricated and is now undergoing performance tests.

The effect of temperature upon the gain stability of a scintillation spectrometer is being determined. Measurements to date show that the gain is temperature dependent but the critical parameters in this effect have not been isolated as yet.

Reactor Safety Project

The results obtained from reactivity and neutron distribution measurements on simulated reactor safety fuse elements prepared by North American Aviation personnel

have been analyzed. These results qualitatively follow the predicted results except in one case wherein slug composition apparently is not as reported. In this instance a slug fabricated at Hanford to the NAA specifications yielded the expected results. These data have been prepared in report form.

The full scale mock-up fuse elements containing compressed $B_{10}F_3$ gas have not yet been received. An analysis of the feasibility of utilizing this type of element at Hanford must await the testing of the $B_{10}F_3$ mock-up assemblies.

Outlet Water Temperature Recording Facilities

Essentially all of the performance test data required from the twelve point prototype K Pile temperature monitor have been obtained and are reported in HW-31890, "Interim Report, Development Test No. 105-564-A, Temperature Monitor Prototype Test," D.E. Stephens. Numerous recommendations and observations are given in this report.

A study has been initiated to determine the feasibility and cost of monitoring outlet water temperatures continuously from selected process tubes in the existing piles, e.g., one of twenty-five tubes. These temperature points could then scram the pile as fixed, preselected temperatures were exceeded. If feasible, such a system might economically back-up the panellit system to protect in the event of power surges which, on a pressure sensitive system, will result in a "trip after boiling" reaction.

Test Pile - Routine Tests

Regular metal testing proceeded routinely during the month. Forty-one billet egg lots yielded TDS values ranging from 14 to 19; these values represent higher impurity content than that routinely experienced. The average is about TDS 17 whereas the previous averages ranged about TDS 14.

The first machined billet eggs were received. Of the sixteen eggs received, ten were outside the established machining specifications.

Eighteen P-10 heats were tested with one rejected for non-conformance with specifications. One hundred twelve J slug heats were tested - a single slug per heat - with the results falling on the normal distribution curve.

Test Pile - Special Tests

Samples of vacuum sweepings obtained during KE Pile graphite lay up were tested to detect unusual impurities if they existed. None of the samples tested indicated the presence of significant contaminants.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

In conjunction with the development of equipment to effect segmental discharge, an expanding holding spline is being fabricated on site. A number of tube and bellows manufacturers have been contacted concerning the development of such a spline. Several promising answers have been received.

The poison column control flushing tests were continued in the 108-D laboratory during the month. Satisfactory flushing of perfs, aluminum solids and lead cadmium poison pieces was obtained. Some difficulty has been encountered with the flushing of regular metal pieces. The flow mock-up is being re-calibrated to measure the flows required for this work and a tip-off is being designed to facilitate the discharging.

Horizontal Rod Studies

The second horizontal rod of the replacement design was installed in the A rod opening at H Area early this month. The rod was equipped with 12 thermocouples and continuous recording apparatus. The highest rod temperature measured to date is approximately 95° and the results indicate that the new rods are satisfactory in every respect insofar as skin temperature considerations pertain. An interim report is being prepared on this production test.

The mock-up for the 105-K horizontal rod is approximately 75% complete. Only one or two items remain to be received. It is anticipated that test work can start early in June.

The built-up washer seals installed on the new rods at B and H Areas were examined during the month and found to be adequate in every respect. The molded seals were received from the vendor and tested. It was found necessary to install a metal sleeve around the outside of the seal to allow it to function properly. Recommendations have been made to Design to proceed with the use of this type seal. The metal sleeve to be used on these seals can be altered to permit a very simple and efficient sniffing device. Recommendations are being made to Design to effect this change.

The boron-carbide rings for use on the half-rod have almost been completed. At that time a final report will be issued discussing this development work.

The fabrication of the first half-rod of the replacement design is still awaiting the cooling tubes from the vendor. The shipment is expected early in June and the rod will be assembled at that time for installation during the June shutdown.

Production test 105-571-A was issued during the month to permit the testing of molded ribbed sphincter seals for the C Pile replacement rods. The seal will be installed during the next outage.

Vertical Rod Studies

The built-up washer seal on VSR 16-C was inspected this month. The seal remains in good condition after 7 months of operation.

All of the necessary components for the K Pile VSR functional test have now been received and are being installed. Test work will commence when this phase is completed.

Supplemental Control

A development and test program is being prepared for the pile safety improvement program. The preliminary plans include experimental work directly associated with

the idea of graphite wetting for supplementary control and cooling. The report on the "Assessment of Disaster Control Systems" was issued during the month and recommends that Design proceed on the scoping and design of a combined supplementary cooling and graphite wetting facility.

A modified nozzle, cap, and seal for the poison spline supplementary control system have been designed and fabricated. A reel has been designed and is now being fabricated. The thin wall aluminum tubing to be used as the spline material has not yet been received from the vendor.

Additional development and test work has been started on the application of BF_3 as a supplementary control medium as recommended in Document HW-30598. A tentative outline of the test program has been drawn up and work will continue toward developing an effective in-pile system.

Process Tube Assembly and Piping

The detailed design and development of a process tube deflection measuring device incorporating the use of rate gyroscopes was started again during the month. The problems associated with handling the electrical signal from the gyro to indicate deflection are being studied and the necessary electrical circuitry determined.

Nineteen of the new "O" ring outlet connectors for C Pile were installed early this month. Inspection of the connectors after several weeks operation indicated the "O" ring joints to be satisfactory. Very short installation times were required.

Work continued on the design of a new flexible connector flexure testing facility.

Flexure testing of production samples for K Pile connectors continued during the month. Additional connectors are being tested as they are received from the vendor.

Materials Testing Reactor Test Facility

The slug testing facility is now being installed at the materials testing reactor. Flow tests are scheduled to start June 2 and the first loaded A piece is scheduled for installation on June 10.

Physical Constants Testing Reactor

The vertical safety disks and horizontal control-safety rods for the physical constants testing reactor were mocked-up in 189-D laboratory and tested during the month. Both systems have been found to operate satisfactorily in every respect. The stress analysis and selection of shafts, gears, clutch and motor arrangements for the movable face have been completed. The procurement and fabrication of these parts has been undertaken.

Liaison continued with Design and Applied Research during the month on the design of the PCTR Building and the graphite packing. Drawings and specifications for the building were completed and approximately 60% of the graphite packing drawings have been completed.

Other Engineering Development Work

The irradiation of various rubber formulations continued during the month. The tensile specimens removed from 105-H early in the month have not yet been tested in 300 Area.

Assistance to the design of Discharge Area Viewing Facilities, Budget item B-2116, continued this month. Provisions for attaching the radiation indicating device to the television carriage are being incorporated in the design.

Fabrication of the core boring device for the Graphite Sub-Units is approximately 90% complete. Preliminary functional testing has been started.

Drafting work was completed on the new under-water saw for irradiated process tube examination work. Fabrication will start early in June.

PILE GRAPHITE STUDIES

A New Graphite - Dimensionally Stable Under Irradiation

In a cooperative program between Battelle Memorial Institute and Hanford, a new graphite has been produced and partially evaluated that has far greater dimensional stability than any graphite previously known. The material was prepared at Battelle from Korite asphalt coke and bonded with Korite asphalt. Specimens were warm molded and heat treated to 2500 C. The material has been irradiated in a cold test hole to about 1500 MD/CT and expanded only about 1/8 as much as CSF graphite. The material at present is characterized by density of about 1.2 gm/cc and a thermal conductivity prior to irradiation of about 0.02 cal/cm/sec/°C. Efforts are now being carried out at Battelle to increase the density of the material while retaining its desirable characteristics. Specimens have been prepared with a density of about 1.55 gm/cc and are being shipped to Hanford for pile material evaluation.

It appears feasible to produce a Korite graphite on a production scale. An adequate supply of raw materials is available, and efforts are being made by Battelle to overcome certain expected difficulties in manufacture. All tests carried out at Hanford to date indicate that the graphite would make a highly superior pile material.

Material Evaluation of Non-Impregnated Graphite

One method of attaining lower density graphite for use in future graphite moderated piles or for other appropriate uses is to omit the impregnation step in the manufacturing process. Reduction of about eight per cent in density on pile graphites used in the past would result from this method. From a standpoint of nuclear purity, non-impregnated graphite appears to have a purity of about .1 dih higher than the impregnated material. Non-impregnated TS-GBF graphite has been evaluated as a pile material. In all tests carried out, a direct comparison was made between impregnated and non-impregnated graphites. Physical expansion in a water cooled test hole was essentially the same for the two materials. The thermal conductivity of the non-impregnated graphite was lower than that of the impregnated

graphite prior to irradiation and was also observed to be lower after exposures at both 30 C and 400 C. Non-impregnated graphite has superior machining characteristics. Less complete tests have been carried out on CS-GHF graphites that were impregnated and non-impregnated. Results obtained were similar to those for TS-GHF graphite.

Non-impregnated graphite appears to be a satisfactory pile material in all respects.

Full Pile Distortion Annealing Experiment - PT 105-531-E

This production test has now been officially terminated as of June 1, and the pile operation has been returned to normal process specifications. On May 21, a third set of burnout monitoring samples were discharged from tube 3478-D. Weight measurements have been obtained and the burnout rates have been calculated. The data indicate the following:

(1) Burnout rates at the maximum temperature and neutron flux positions are 11.5 per cent/1000 days and 3.7 per cent/1000 days for small (0.426" diameter) and large (1.0" diameter) samples respectively measured for an exposure period of 127 days and a total oxidation of 1.5 per cent and .5 per cent.

(2) The weight losses observed on samples upstream and downstream fringes are considerably less than the center zone samples and, therefore, indicate lower burnout rates. These are 0.18 per cent/1000 days and 0.05 per cent/1000 days respectively.

(3) The extreme downstream samples have indicated burnout rates about one-fourth of those in the equivalent flux and temperature position in the front of the pile. This may be the result of the retardation effect of the presumed presence of CO or the result of the deposition of the polymerized sub-oxides of carbon.

Full Pile Burnout Experiment - PT 105-530-E

On May 26, the final mining and burnout sample discharges as authorized by this production test were accomplished. Four channels of burnout samples were discharged and two channels were mined. The results of these samples have not yet been analyzed. The H Pile is now returned to normal operation under process specifications.

High Temperature Burnout Experiment - PT 105-514-E

On May 24, the final authorized heater assembly was discharged from 1075-F channel at F Pile. Because the heater failed in the early stages of this exposure, the temperature history of these burnout samples is somewhat erratic. The temperature history was recorded by a Brown controlled-recorder as well as a newly designed time-temperature integrator. The record of these two systems is now being checked to determine a reasonable exposure temperature. Preliminary weight loss measurements indicate a considerable gradient of reaction along the length of the samples within the heater core. It is felt that this does not indicate a temperature gradient since the temperature history was a result of pile rather than heater operation and, therefore, should be uniform within the samples. Rather, such a gradient appears

to be the result of the retardation effect of carbon monoxide presumably present in increasing concentration in the gas atmosphere as the gas flows over the samples. The actual magnitude of the weight losses are still being checked in that the samples are being dessicated to a constant weight.

Higher Temperature Graphite Burnout - PT 105-536-E

A single birdcage fabricated from zirconium wire containing four samples which was originally charged on April 5 was discharged from 2785-C on May 20. Preliminary weight measurements indicate that the samples must have absorbed a large quantity of water. The samples are now being dessicated to obtain constant weight. The temperature history varied considerably as a result of pile operation. The temperature history is being analyzed to obtain a reasonable exposure temperature. It is of interest to note that radiation level of the zirconium birdcase was 2R/hr at four feet one week after removal from the pile. Visual investigation of the zirconium indicates that the wire has undergone considerable reaction.

Effect of Exposure Temperature on Radiation Damage - PT 105-403-A

Recent measurements of the physical properties of samples exposed to pseudo controlled temperatures in the range 100-200 C under this production test again emphasized the large effect of high temperature exposure. A review of all the data obtained on this subject is now being made and will soon be issued as an interim report. The newly designed heaters and control system will be ready for installation next month.

WATER PLANT DEVELOPMENT

Flow Laboratory Tests

In-pile tests of reduced pH, reduced dichromate, and unfiltered water continued. Current tests are as follows: two tubes with process water at pH 7.3 and 0.2 ppm dichromate; one tube process water at pH 7.0 and 0.2 dichromate; and two tubes unfiltered water at pH 7.0 and 5 ppm dichromate. The three process water tests are piloting a proposed series of pH and dichromate reductions in the piles, as described in the next section. The unfiltered water tests are a continuation of the raw water program aimed at determining the minimum additives needed to make Columbia River water a satisfactory pile coolant. Slugs exposed for three weeks in the mock-up facilities to pH 7.3, 0.2 ppm dichromate at 120 C showed corrosion weights of one-quarter to one-half of those predicted in regular process water.

Construction of the 1706-KE Water Studies Semi-Works proceeded. It now appears likely that the target completion date of November 30, 1954, will not be met because of procurement delays.

Plant Tests

A series of progressive reductions of process water pH and dichromate, to 7.0 and 0.2 ppm, respectively, has been planned. The first step in the process is the reduction of pH to 7.3 by sulfuric acid addition at one-half of the 100-F plant. This test has operated satisfactorily for about six weeks; no corrosion data have been obtained as yet, but an absence of film formation on the low pH side is significant. To date, operating costs on the two sides are approximately the same.

The next step is reduction of dichromate at one-half of D Pile. Production test approval has been received, and reduction of dichromate feed to 0.5 ppm is scheduled for the next shutdown. Combination of reduced pH and dichromate will be carried, based on results of these tests and current Flow Laboratory experiments.

Operation of the high filter rate test continued at 183-D. Several process changes have been proposed to improve coagulation and thus lengthen filter run time as limited by impurity breakthrough. These changes have been incorporated in a production test now being circulated for approval; included are reduction of coagulation pH by acid addition, increase in allowable chloride and chlorine limits, and a greater percentage neutralization of activated silica. Installation of the needed acid addition equipment is nearing completion.

An evaluation of results from the chlorine test at DR has shown that reduced chlorine addition with the alum-silica treatment process is unnecessary and, to some extent, detrimental to water plant operation. A letter has been prepared to establish chlorine addition procedures in light of this information. A development test was authorized to permit an investigation of the coagulation effects of different points of alum and silica addition. This test is being conducted to determine whether changes will be required in points of addition in the K water plants.

Recirculation Studies

Operation of the in-pile H Recirculation Loop continued; water purity was increased to 1.5 megohm-cm and outlet temperature was maintained at an average 130 C. An automatic flow controller was installed in the loop to enable better control of operating variables.

The 175 C isothermal loop operated throughout the month. For periods up to three weeks, the test slugs showed slight weight gains (0.25 mg/cm^2 in 21 days). Extrapolation of the weight-time curves indicates that weight losses will occur after four to six weeks' exposure. The initial weight gain followed by a weight loss corresponds physically to a build-up of oxide to an equilibrium point, after which weight losses reflect direct loss of metal.

Procurement of high temperature experimental facilities progressed. Construction of the one gpm, 300 C loop is nearing completion, and preliminary testing of the facility is scheduled during June. A review was made of current scope drawings for the KER recirculation facility.

Boiling Studies

Testing of corrosion effects in steam-water mixtures continued. Measurement of slug weight changes were made after exposure to 20 per cent quality steam at 190 C and a velocity of 150 fps; slight weight gains were observed after one, two, and three weeks' exposure and weight losses, up to two grams per slug, occurred after six and nine weeks' exposure. Five weeks of a scheduled nine weeks' exposure has been accumulated in the in-tube condensing test, in which slugs are exposed to steam qualities varying from 100 per cent to 20 per cent, with temperatures between 180 and 190 C.

Examination of canned aluminum slugs from the out-of-pile recirculation boiling loop showed an unusual correlation of corrosion with slug junction and temperature. In the front portion of the tube liquid phase temperature increased from 85 to 180 C; slug weight change in the region increased from -0.06 mg/cm^2/day to + 0.03 mg/cm^2/day. In the rear portion of the tube, temperature was constant at about 180 C, and steam quality increased from 0 to 10 per cent. A constant corrosion weight gain was observed in this section of about 0.01 mg/cm^2. The loop test section was recharged with uranium slugs and put on stream.

Preparation of a production test supplement to permit boiling in the H Recirculation Loop is delayed until further data are available from the Heat Transfer mock-up tube. Necessary modifications to the H Loop equipment are being made as available shutdown time permits.

PILE COOLANT STUDIES

Production Tests

Examination of the ruptured slug from tube 2679-C, which operated with 99 C average outlet water temperature under PT 105-519-E, revealed a large elliptical hole torn in the side of the can. This slug was one of those which was coated with an abrasion resistant coating. The can surface was not severely corroded, and the thickness of the aluminum was good at the edges of the hole.

A second slug (also the 27th from the rear) ruptured in another tube (2670-C) operating with similar conditions under this test. Examination of the ruptured piece showed it to be severed approximately two-thirds of the distance from the weld end. The uranium core was split longitudinally in two places. The wavering line on the can surface appeared to be a stretched or necked down region that corresponds to one of the cracks in the core. Again the remaining aluminum appeared sound and lightly corroded. Other coated slugs from this tube did not show the marked improvement in corrosion that was observed in tube 2679-C.

PT 105-529-E, authorizing 95 C corrosion limit for H Pile, will be closed out with a final report when the new corrosion specifications go into effect. The weighed slugs in the pile will continue to be used to monitor the effect of the higher temperatures.

PT 105-542-E, "Reduction of the Amount of Dichromate Added to the Pile Cooling Water", has been approved and will go into effect after the next D Pile shutdown. One-half of the pile will be cooled with water containing 0.5 ppm sodium dichromate, one-fourth the specified concentration. After sufficient testing at this concentration, 0.2 ppm will be investigated.

Tube Examination

Eight pile process tubes were examined during the month, with the following items of interest being observed:

2683-F and 3782-F were severely corroded on the outside near the gun barrel. Both were penetrated by pinholes as a result.

Sections of 2890-H were pressure tested to failure in the DR examination pit. A center section burst at over 2000 psi in the vicinity of a pitted slug junction. Most tubes, including new ones, burst at 1600 to 1700 psi.

3188-H exhibited severe ledge type corrosion. The tube metal appeared to have melted at a point where a rupture occurred.

The film pattern in 2991-H indicated three cocked slugs. One of these may have caused the stuck charge in this tube.

Samples from ten tubes were metallurgically examined at the 108-B laboratory, yielding further data on remaining thickness. The pre-installation marking of K tubes was completed. Removal of tubes from K piles will not require any further marking of the sections to identify their locations in the pile. For the old piles, a new simplified labeling device was developed and successfully tested. A marked tape is directly applied to the tubes as they are removed from the pile.

Inspection of the 105-C effleunt line and a 105-H high tank revealed them to be in good condition.

Laboratory Corrosion Studies

A section of 72-S clad process tubing exposed for 45 days to 105 C water in the weighed tube mock-up showed a weight loss corresponding to a corrosion rate of 1.3 mils/month.

The effects of combined low pH and low dichromate are being tested in the fifty tube mock-up in both cold and hot water. Process water adjusted to pH 7.3 has been tested between 120 C and 130C for three weeks and up to 140 C for one week. No scale or film has been observed to form yet.

The addition of two ppm dichromate to the soft water Minitube test resulted in an improved corrosion rate at 115 C only. Weight losses at higher temperatures were the same as without dichromate. However, considerable pitting, possibly caused by an air leak, was observed at 155 and 175 C. New data without the air leak are being obtained.

No significant difference has been apparent in the corrosion effects of velocities between 12 and 45 feet per second after 30 days at 95 C.

Aluminum slugs in a zirconium tube at 130 C in pH 7.3 water for two weeks exhibited no surface pitting. The corrosion rate was the same as for similar slugs in an aluminum tube. The test now includes 140 C.

SPECIAL IRRADIATIONS

The seventh in a series of creep assemblies was charged into F Pile May 24. The three stainless steel samples in this assembly will be maintained at an in-pile temperature of 600 C. The assembly was operated out-of-pile for seven days to establish a creep rate.

The KAPL-120 loop was put back into operation on May 2, after a six month shutdown for repairs. Operation since this start-up has been interrupted twice by a minor oil fire and instrument failure. An estimate and scope drawings are being prepared for a new loop. Removal plans for the existing loop proceeded as per schedule.

Arrangements are in progress for the irradiation of reactor safety elements (NAA-109). Criteria for irradiation have been specified to North American Aviation, and fabrication is in progress at that site.

Preparations are being made to assume responsibility for the MTR Slug Irradiation Facility. The facility is tentatively scheduled to commence operation on June 9.

Heat generation in zirconium (HAPO-112) is being studied. In the flattened zone of H Pile at full power level the heat generation in this material is about 0.2 watt per gram.

A sensitive portable ionization chamber has been developed for laboratory and field work. Sensitivities of two mr/hr full scale have been achieved.

Equipment pertinent to the irradiation of zirconium process tubes has been developed (HAPO-110). The actual irradiation pends arrival of the tubes at this site.

Steam-graphite-zirconium interaction experiments are being set up on a laboratory basis in conjunction with preparations for in-pile studies involving the same components.

Design studies for new facilities have included:

1. Short term irradiation facility to replace the E test hole facility at F Pile.

2. High temperature irradiation facility.

3. New snout facility.

Close liaison has been maintained with the development of the new facilities for the K Piles and the installation of piping and test hole instrumentation at C Pile.

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

TECHNICAL LIAISON

KE Loop

Preparation of scope drawings and design criteria for this facility was resumed early this month, participated in by Technical Liaison personnel. The decision was made to use primary pumps of conventional seal design rather than the canned rotor type that had been considered. Technical consideration is being given to the suggestion that one of the four loops be fabricated from some material other than stainless steel having promising corrosion resistance properties to determine if a lower cost material can be found which is suitable for high temperature, high pressure, in-pile use.

Power Recovery Studies

Attention was given to the possibility of recovering useful amounts of electric power from existing reactor facilities. Some of the initial conclusions were:

a. It is probably not wise to make a complete conversion of an existing pile to the equivalent of the proposed dual purpose reactor, since the conversion costs may approach the actual cost of the new pile.

b. Modification of an existing pile for power recovery looks best at the K Piles because of the greater amounts of heat available and the longer expected operating life of the pile.

c. More detailed consideration appears justified for at least three methods of power recovery, roughly classified as: (1) "as built" effluent water; (2) modest pressurization of the full pile; (3) higher pressurization of a portion of a pile.

Pile Amortization Studies

Consideration has been given to the probable physical limits to pile life. Calculations have also been made of the pay-off period for replacing the old irradiation facilities with installation of more recent design in order to arrive at a reasonable estimate of useful pile life or pile obsolescence.

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.

R B Richards

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

1213812

G-1532, 1-D

GENERAL ELECTRIC COMPANY

HW-31964 DEL

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

June 7, 1954

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

MAY, 1954

A PRIME CONTRACTOR FOR THE U.S. ATOMIC ENERGY COMMISSION

VISITORS AND TRIPS

B. F. Judson visited the Oak Ridge National Laboratory, Oak Ridge, Tennessee, May 3 through 7, to discuss recovery operations at X-10.

G. C. Oberg and R. E. Tomlinson visited Phillips Petroleum, AEC Reactor Station #8, Arco, Idaho Falls, Idaho, May 13 and 14, for discussion of mutual problems on separations plants.

E. W. Christopherson visited the Brookhaven National Laboratory, Uptown, Long Island, New York, May 26, 27, and 28, to present paper and attend 3rd information conference meeting on hot laboratories.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	April	May
Administrative	2	2
Chemical Development	71	72
Plant Processes	48	49
Analytical Laboratories	35	34
P-10 Process Studies	9	1
Total	165	158

Chemical Development: One Technical Graduate - Rotational was transferred in from Manufacturing, two Technical Graduates - Rotational were permanently assigned, one Junior Engineer was transferred in from Analytical Laboratories, two Junior Engineers were transferred in from P-10 Process Studies, one Engineer II was transferred to Plant Processes, one Senior Engineer was transferred to Pile Technology, one Technical Graduate - Rotational was transferred to Radiological Sciences.

Plant Processes: One Chemist II was transferred in from Applied Research, one Secretary "C" was transferred in from P-10 Process Studies, one Engineer II was transferred in from Chemical Development, one Stenographer was transferred to Manufacturing, one Chemist II was terminated.

Analytical Laboratories: One Technical Graduate - Rotational was permanently assigned, one Junior Engineer was transferred to Plant Processes.

P-10 Process Studies: One Secretary "C" was transferred to Plant Processes, two Junior Engineers were transferred to Chemical Development, one Junior Engineer was transferred to Fuel Technology, one Engineer I was transferred to Applied Research, one Engineer was transferred to Pile Technology, one Junior Engineer was transferred to Pile Technology, one Engineer II was transferred to Pile Technology.

PUREX DEVELOPMENT

Technical Manual

On May 25 the preparation of the Purex Technical Manual was approximately 29 per cent complete.

Mechanical Development

Pump Development - A Johnston 6AC, 5-stage, deepwell turbine pump (Uranium Recovery Plant Pump P-19-7) has operated on life test for 4019 hours pumping nitric acid. The pump is equipped with CSGBF pile graphite bearings. The first 1500 hours of operation were at 70 gal./min. against a 6 foot head. The remaining operation has been at 8 gal./min. against a 72 foot head. Inspection after 4019 hours showed a maximum bearing wear of 6.7 mils and an average wear for the 8 bearings of about 4 mils.

Bearing Development - A gold plated stainless steel bearing with 0.003 inch thick pure gold plating performed well (low friction and high load carrying capacity) against a Type 304 stainless steel journal when lubricated with HAX solution. With water lubricant and a stainless steel journal the bearing bound at a load of 50 lb./sq.in. The results with both water and HAX lubricants are the best yet obtained with gold bearings.

Instrument Development: Interface Control - The location of a capacitance probe for interface control in a side chamber connected in parallel with the 2A Column "beaver-tail" bottom disengaging section was shown to be satisfactory insofar as both hydraulics and control are concerned. This type of installation makes the capacitance probe susceptible to remote maintenance.

Materials Testing

Nitric Acid Fractionator Corrosion Studies - A 90 hour run in a one-tube pilot plant fractionator showed that the corrosion rate of Type 304L heat transfer surface in Purex IWW (8.5 molar HNO_3) boiling at 235 F at atmospheric pressure heated by steam at 335 F, was less than 0.001 in./mo. A previous test showed that under similar conditions the corrosion rate of Type 347 stainless steel was 0.006 in./mo. Although this apparent 6-fold lower corrosion for 304L would be significant in terms of longer Purex acid concentrator life, the indicated difference may be within the normally experienced variation from heat to heat for both of these stainless steels. The Purex Plant acid concentrators are being constructed of 304L shells and extruded 304L tubes.

Irradiation of Kel-F - Seven of the ten flexural fatigue coupons of perforated Kel-F sheet under test were replaced by decontaminated coupons which had been irradiated to 5×10^6, 1×10^7, 5×10^7, and 1×10^8 roentgens.

The flexural fatigue test is carried out at an average stress of 600 lb./sq.in. which is calculated to be 10 to 20 times as great as that to be experienced in the Purex Plant columns.

Protective Coatings - The peeling of Amercoat 55, such as was observed in Cell No. 15 of the Uranium Recovery Plant, was reproduced by suspending coupons in the vapor above 20 per cent nitric acid solution at 60 C.

REDOX DEVELOPMENT

Process Chemistry

Hydrogen Evolution from Mercury Catalyzed Dissolvings - The first four of a series of laboratory dissolvings aimed at eliminating or minimizing the evolution of hydrogen from the reaction between HNO_3 and Al in the presence of Hg as a catalyst, have been completed. Analysis by mass spectrometer of the off-gas from the reaction indicated that the peak of hydrogen evolution coincided with the most vigorous reaction during dissolving, resulting in maximal values for H_2 in the off-gas ranging from 3.9 to 12.8 volume per cent. A series of additional runs is planned under a wide range of conditions, including the addition of uranyl nitrate, sodium nitrate, and aluminum nitrate solutions at the start of the aluminum dissolution to minimize hydrogen evolution. Palladium black catalyst is being used in a series of tests to study the catalytic recombination of H_2 in gas mixtures. The initial results are encouraging, since even at a bed temperature of 25 C, 42 per cent of the volume of an original mixture of air and hydrogen was removed in one pass. Based on the stoichiometric reaction of $2H_2 + O_2 = 2H_2O$, 37 per cent should have been removed. The difference is ascribed to the adsorption of free hydrogen on the Pd. It is planned to study the effects of catalyst bed temperatures, gas flow rates, and potential catalyst poisons, e.g., I_2 and S.

Ammonia Evolution During Caustic Coating Removal - The standard technique for removing the Al jackets from irradiated slugs (NaOH plus $NaNO_3$) was found in a series of 3 recent determinations in the laboratory to produce from 0.23 to 0.25 mole of NH_3 for each mole of Al dissolved. The addition of an oxidizing agent such as $Cr_2O_7^=$ or MnO_4^- to suppress NH_3 formation was unsuccessful in preliminary tests, since the presence of 0.25 mole of either oxidant per mole of Al completely inhibited the dissolving of the Al in these scouting runs. Further tests are planned, however, since it is not likely that these initial results will be duplicated at all concentrations of oxidant.

Head End - Stability of RuO_4 - Laboratory tests have indicated that the room temperature reduction of volatile RuO_4 to solid RuO_2 is catalyzed by light but unaffected by beta or gamma radiation. At room temperature in the absence of light, the reaction apparently involves three components: RuO_4, water, and stainless steel or some other solid surface. Under these conditions, RuO_2 plating could be inhibited by exclusion of water. In the presence of water, RuO_2 plating took place within 15 minutes when stainless steel, copper, cast iron, aluminum, or lead was present, but less rapidly or not at all when these metals were replaced with gold, platinum, glass, fluorothene, or Lucite plastic.

Head End - Preparation of Synthetic Dissolver Solution - $Ru^{106}Cl_3$ received from ORNL was mixed (50 micrograms) with 6 mg. of "inactive" Ru and reduced to the metal in an atmosphere of H_2. This powder was then submitted to the 234-5 Development group of the Plant Processes Unit where it was intimately mixed with UF_4 powder which was in turn reduced to U metal. The resulting button was broken into quarters, dissolved in HNO_3, and the solutions were then analyzed for Ru. The results indicate that essentially none of the Ru was lost in the slag during reduction, and that its distribution in the uranium metal was uniform. The solution is to be used for additional head-end studies following an electrochromatographic analysis to determine the degree to which the Ru species correspond to those found in Redox plant dissolved metal.

Head End - Ru in the Redox Canyon - To check the possibility that RuO_4 may be routinely escaping into the canyon, coupons of Tygon and Teflon were prepared in the laboratory for exposure to the canyon atmosphere. RuO_4 is known to be instantaneously reduced by Tygon (and deposited on it) but does not deposit on Teflon, so that a comparison of the extent of contamination on each type of material should be expected to provide an indication of the presence (or absence) of RuO_4 in canyon ventilation air. After more than 3 weeks' exposure suspended from the beam of the canyon crane, neither Tygon nor Teflon showed any radioactivity. Two additional strings of coupons are still in the canyon.

Head End - Volatilization of Ru from NaOH Solution - It has been demonstrated in the laboratory that less than 0.2 per cent of the $RuO_4^=$ present in a caustic scrubber is reoxidized and removed by sparging with 2 volume per cent ozone in air.

Intercycle Fission Product Decontamination - The possibility of eliminating the current permanganate head end process and replacing it with a similar type of treatment of the aqueous product stream from a co-decontamination flowsheet, appears promising, based on preliminary laboratory experiments in which a Ru decontamination factor of 15 was obtained during ICU concentration in the presence of $KMnO_4$. This was accompanied by an apparent Ru "conditioning" since the subsequent batch solvent extraction contacts simulating the next cycle, produced a 3 to 4-fold improvement in Ru decontamination over that obtained with the same solution which had not undergone the intercycle oxidation. The feed solution used was synthesized from hexone saturated ICU obtained from the Redox Plant following the deletion of the head end treatment for 2 consecutive feed batches. Most of the Ru volatilized was collected on the Raschig ring tower packing (1/4 inch stainless steel rings) immediately above the pot, but 1.5 per cent of the ruthenium was found in the condensate overhead.

Tail-End: Ozonolysis of Uranium Product Solution - The use of an ozone sparge for the post-extraction removal of Ru from the final Redox uranium stream, has yielded arithmetical Ru decontamination factors of approximately 6 following a 4 hour sparge with 2 per cent O_3 in air where the sparging rate was approximately 1 volume of gas per volume of solution per minute.

The magnitude of the decontamination achieved was directly proportional to the rate of sparge. The starting solution was a sample of the uranium produced in the Redox Plant during that period in which no head end treatment was being given the IAF.

URANIUM RECOVERY DEVELOPMENT

Process Studies

Correlation of UO_3 Plant Fission Product Data - During the past year fission product data have been routinely accumulated on the various 224-U Building (UO_3 Plant) operations. Most of these data were obtained to evaluate the effect of process changes on fission product behavior and/or to determine fission product balances around isolated equipment pieces. These data are being evaluated in an attempt to determine the path of fission products in the various 224-U processing steps. Pertinent conclusions drawn from the data thus far are:

1. Whenever the initial 100 per cent UNH solution charged to the calcination pots contains a significant and fairly accurately measured amount of ruthenium activity, a ruthenium decontamination factor of greater than 5 is consistently achieved during the calcination step.

2. No evidence of fission product buildup has been noticed in the 224-U Building HNO_3 Fractionator, the HNO_3 Absorber, or the calcination pot vent lines. From the 224-U Building experience it would be expected that any activity which might get into the Purex controlled zone vacuum fractionation unit for HNO_3 would be carried back into the Plant with the recovered acid.

MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

Process Studies

Bismuth Phosphate Process: Scavenging of First Cycle Wastes - Report HW-31988, "Nickel Ferrocyanide Scavenging of First Cycle $BiPO_4$ Wastes," has been prepared. This document compares three alternative methods of treating the first cycle wastes, namely: (a) scavenging in the 221-T Building before sending the first cycle waste to cribs, (b) initial storage in underground tanks with subsequent scavenging in the tank farm process vaults originally provided for the preparation of TBP Plant feed from the stored $BiPO_4$ Process uranium waste, or (c) evaporation in the first cycle waste evaporators which are currently being used for the evaporation of TBP wastes. In addition to a slight economic advantage of the first alternative (scavenging in T-Plant), this method would add the least to the burden of 200 Area waste tank scheduling. Wastes would be routed through settling tanks directly to cribs to ease the already tight waste tank scheduling.

Bipex Process - If significant quantities of uranium are to be irradiated to a 215 MWD/T level in the Hanford piles, the existing Hanford uranium separations capacity may be exceeded. A study is being made to determine the increased

uranium processing capacity which might be achieved, if various modifications of the Bipex Process were constructed and operated. As currently visualized, the Bipex Process is a combination of the Bismuth Phosphate Process and the TBP Process. The plutonium after the initial $BiPO_4$ decontamination would be sent to a plutonium TBP-type solvent extraction cycle for additional decontamination.

Although the study has not been completed, preliminary order-of-magnitude estimates indicate that a uranium processing rate of 180 to 200 tons/month might be achieved in a Bipex Plant which would require an initial capital investment on the order of $10,000,000. For a sustained 215 MWD/T program (greater than 5 years) it would tentatively be economically justified to build a new Purex Plant.

Thorex Process Study Flowsheets No. 7 and No. 8 were issued as Document HW-31687. The No. 7 and No. 8 Flowsheets depict processing conditions for different types of thorium fuel elements. The No. 7 Flowsheet uses HNO_3 salting agent for the processing of thorium slugs which have been "cooled" 300 days after discharge from the piles, while the No. 8 Flowsheet uses acid deficient aluminum nitrate salting agent for processing 90 day "cooled" thorium slugs.

The basic process and equipment requirements for both the No. 7 and No. 8 Flowsheets are quite similar to those used for Purex uranium processing. Therefore, if the feasibility of these flowsheets is confirmed in laboratory and pilot plant studies, either of them should be fairly simply adaptable for use in a dual purpose Thorex-Purex Plant; i.e., a plant capable of alternately processing thorium slugs at Thorex Flowsheet conditions or uranium slugs at Purex Flowsheet conditions.

Chemical Engineering Development

High Efficiency Pulse Column Development - Thirty-three high efficiency pulse column development studies were made in a 3 inch diameter glass column, with "cold" uranium as the diffusing component, under the approximate conditions of the Purex HW #2 Chemical Flowsheet HA Column (with the solvent (HAX) pre-acidified to 0.5 M HNO_3, to aid initial phase dispersion). The highlights of the new findings are as follows:

1. Substantially improved column efficiency (decreased H.T.U.) was obtained by baffling each sieve plate in such a way as to force the countercurrently flowing liquids to follow a zigzag path through the column. An H.T.U. value as low as 0.73 inch was measured with 1/2 inch spaced stainless steel plates with 0.026 inch holes giving 15 per cent gross free area, with two-thirds of the area of each sieve plate covered with an (unperforated) stainless steel disc, leaving a 5 per cent net free area. The 0.73 inch H.T.U. was determined at 200 gal./(hr.)(sq.ft.), sum of flows, 0.2 inch pulse amplitude, 160 cycle/minute. With otherwise the same plate section design but without baffles, the H.T.U. at 200 gal./(hr.)(sq.ft.) at favorable pulse conditions (0.25 inch amplitude, 220 cycle/minute) was 1.2 inch.

2. The substantial H.T.U. advantage obtained with the above described baffles was confined to relatively low flow rates. Thus at 500 gal./(hr.)(sq.ft.), sum of flows, with the plate sections described above the H.T.U. with the baffles approximately equalled the (interpolated) H.T.U. without baffles.

3. Decreasing the plate spacing from 1/2 inch to 1/4 inch resulted in only an approximately 10 to 20 per cent reduction in H.T.U. in one comparison made with 0.026 inch hole sieve plates (unbaffled).

HOT SEMIWORKS

Conversion to Purex

The design of the experimental waste self concentrator is 80 per cent complete with only electrical and instrument design to be completed.

The construction phase of the conversion effort is 47 per cent complete with effort being concentrated in A Cell in order that beneficial occupancy of that portion may be obtained as soon as possible.

URANIUM RECOVERY PROCESS TECHNOLOGY

Metal Removal

Approximately 3810 net gallons of stored waste were removed by water sluicing and direct supernatant transfer for each ton of new uranium processed. Water sluicing increased the above volume by about 3760 gallons per ton of uranium. Ninety-one per cent of the removed uranium was aged a minimum of 3.3 years since pile discharge after irradiation to an average 323 MWD/T, 5.6 per cent was aged a minimum of 2.6 years with average 487 MWD/T exposure and the balance was aged about six years after 200 MWD/T exposure. Sustained high uranium removal rates, with maximum values approaching 10 to 11 tons of uranium per day, were demonstrated at BXR facility through the use of continuous water sluicing with intermittent blending. This same method was initiated at TXR facility and some initial improvement in removal rates was attained. A new seven day period removal rate record of 167 per cent of extraction plant nominal design input capacity was realized with only three tank farms making significant contributions. The major cause of production curtailments leading to an overall operating efficiency of about 87 per cent was the depletion of waste in U Farm tanks. Full utilization of the UR facility for the blending of TX Farm supernatants has not been required and only 2.3 per cent of the total feed supplied to the solvent extraction plant was through this routing.

Feed Preparation

Routine acidification of the above feeds at the tank farms, in 241-WR Vault, and in 221-U Building used about 10880 pounds of 100 per cent nitric acid per ton of uranium. The acid butts used were targeted at maintenance of 3.2 to 3.5 M titratable nitric acid in the concentrated feed. Reduction in nitric acid consumption per ton of uranium required to attain the nitric acid concentration target was realized when the concentration of uranium permitted

in feed was increased from 0.27 M to the maximum attainable within solubility limits. The acidification steps were followed by an average 63 volume per cent boiloff in 221-U evaporators to give feed of the following average composition.

	Components M(a)					$K^{1/2}_{NO_3}$
	U	SO_4(c)	PO_4	HNO_3(b)	Na	Range
Feed	0.31	0.28	0.29	3.47	3.76	4.1 to 6.7
TBP HW #4	0.27	0.26	0.26	2.70	4.06	5.5

(a) Balance of anion is NO_3^-.

(b) Titratable including 2 H^+ ions each from $SO_4^=$, and $PO_4^=$.

(c) Estimated equal to $PO_4^=$.

The concentrated, slurry rich (Na/U, M/M, <15) feed was fed uncentrifuged to the RA Columns. About 4.4 per cent of the feed required two cycle decontamination and this feed handling operation was accomplished by direct butting of RCU to about 2 M HNO_3 for use as second cycle feed without concentration.

Waste Handling

Approximately 3710 gallons of neutralized concentrated salt waste at an average pH of 9.2 were returned to underground storage for each ton of new uranium processed. This waste contained about 0.61 per cent of the new feed uranium. About 16400 gallons of low activity waste, containing an additional 0.2 per cent of the feed uranium were routinely cribbed for each ton of new uranium processed.

Solvent Extraction

Operating Conditions

The total uranium processed by the solvent extraction batteries was 153 per cent of the nominal design input rate including 95 per cent virgin, 4.1 per cent RCU rework, 0.2 per cent 224-U rework, and 0.4 per cent 221-U waste (flushes, spills) rework uranium. The overall on-stream time efficiencies for "A" and "B" Lines were 93 and 94 per cent, respectively. Nominal single line instantaneous processing rates ranged from 100 to 180 per cent of the nominal design rate.

Operations were generally carried out at TBP No. 4 Flowsheet conditions using 20 volume per cent TBP in hydrocarbon diluent as the organic phase and dual-scrub RA Columns. Nominal flow rates expressed as per cent of flowsheet rates were:

Line	RAF	RAS	RAIS	RAX	RCX	ROS (To RO Column)	ROS (To 18(20)-1)
A	75 to 110	100	100	90 to 110	50 to 60	100	150
B	70 to 110	100	100	105 to 110	55 to 60	100	150

Departures from flowsheet conditions included:

1. RCX and RAF temperatures were 55 ± 5 C (giving RAX and RAW at 45 to 50 C).
2. The RAIS (intermediate scrub) contained 6.0 M HNO_3.
3. The "titratable" nitric acid in the concentrated RAF ranged from 2.5 to 4.7 M and averaged 3.5 M vice a flowsheet value of 2.7 M.
4. An additional continuous in-tank co-current organic wash using three weight per cent sodium carbonate solution (ROS) at L/V about 0.5 was employed.

The feed gamma activity averaged 11.7 curies per 10 kilograms of uranium (3.8×10^6 per cent of aged natural uranium activity). This is lower than previous months in which feeds known to be older and to have been given the same or less pile irradiation, were processed, because of the slurry rich nature of the feed during May. Long term data show that long-lived Cs^{137}, the major gamma activity contributor in any feed aged over 2.5 to 3 years, is found at higher Cs/U ratio in supernatant than in slurry.

General Performance

RAW losses averaged 0.5 per cent of the feed uranium on both lines. Had rate and feed concentration control been better, it is probable that these losses would have been reduced by about 50 per cent. The "A" Line RAW losses were decreased from 0.3 to 0.1 per cent by increasing the RAX flow from 90 to 110 per cent of the HW No. 4 TBP Flowsheet rate. The "B" Line "steady-state" losses were about three-fold higher than those on "A" Line operating under the same nominal conditions because of small but significant differences in the uranium feed rate and in the organic phase TBP concentration.

RCW losses averaged 0.1 and 0.04 per cent of the feed uranium on "A" and "B" Lines, respectively. The "A" Line operation was generally upset and unstable and required abnormally low pulse frequencies of 50 to 75 cycles per minute to prevent emulsification and flooding. Steady-state operation on "B" Line with RCX flow 55 per cent of the flowsheet rate, L/V 0.64, and a pulse frequency of 80 cycles per minute, resulted in average losses of 0.04 per cent. In the past, steady-state losses of less than 0.02 per cent have been sustained using 60 per cent RCX and frequencies from 85 to 90 cycles per minute. Currently RC Column frequencies are being increased in an attempt to reduce the loss at the lower RCX rate. Variation of the volume velocity from 350 to 800 gallons per hour per square foot caused no significant change in the RCW loss.

Gamma decontamination was generally satisfactory, both lines giving an average dF of 4.2. The gamma activity of the RCU transferred to the UO_3 Plant averaged 253 and 224 per cent of aged natural uranium activity on "A" and "B" Lines, respectively. Decontamination performance did not change significantly following an extraction battery RCU system flushes made May 4 and 5.

Product RCU activity increased from 200 to 250 per cent of that of aged natural uranium when about 10 per cent of the feed uranium was derived from supernate from Tank 114-TX (aged 31 to 40 months since discharge from the piles where it was exposed to 487 MWD/T). Ruthenium analyses of several feed batches processed immediately after the cessation of 114-TX supernate blending showed the RCU activity to be directly proportional to the feed ruthenium concentration. The observed ruthenium dF during this period remained constant at about 3.5. Using this dF for ruthenium, the minimum effective feed age at various pile exposures that can be processed under current conditions to give 300 per cent ANU product gamma activities is calculated to be approximately:

Average MWD/T	Effective(1) Age Since Pile Discharge, Years
200	3.5
300	4.1
400	4.5
600	5.1

(1) Based on long term average gross gamma feed activities and the data in HW-17091.

Plutonium, metallic impurities, and nitric acid in the RCU averaged six parts per billion parts of uranium, 120 parts per million parts of uranium, and 0.06 pounds per pound of uranium (0.03 M at flowsheet uranium concentration), respectively.

Solvent Treatment

The consumption of TBP and diluent during the report period was 6 and 23 gallons per ton of uranium processed, respectively. This 3 to 4 fold increase over March and April results from discontinuance of batch separation in 276 Building necessitated by operating problems. Continuous washing at L/V of about 0.05 in the RO Column and 0.1 in the ROO Tank (Tk. 18-1 or 20-1) using an aqueous phase containing three weight per cent sodium carbonate give dF's of 0.9 to 1.4 for uranium and 0.4 for gamma activity.

URANIUM CONVERSION PROCESS TECHNOLOGY

Uranium concentration and UO_3 conversion operations were carried out at about 87 per cent of nominal design rates (including gas fired pots now in service)

to produce UO_3 including about 78 per cent TBP source, and 22 per cent Redox source uranium. Metallic impurities, gamma, and plutonium in UO_3 product averaged 124 parts per million parts of uranium, 74 per cent of aged natural uranium, and less than five parts per billion parts of uranium, respectively. Less than five per cent of the UO_3 was produced in gas-fired pots. Corresponding solvent extraction processing operations carried out in the Redox and TBP Plants produced UNH feed for conversion to UO_3 at 104 per cent of 224-U nominal design rate during this period with a resulting buildup of stored UNH (all Redox) inventory. Production curtailments included the loss of one Luckey Pot (No. 20) through agitator shaft seal failure, and miscellaneous down time associated with the pot room ventilation and unloading systems. Recurrent X-3 (unloading filter), and X-11 (ventilation filter) bag failures and mechanical difficulties with filter bag blow-rings have been coincident with the increased utilization of the Luckey pots and, until appropriate modifications to processing techniques and equipment currently under evaluation are applied to this system, a gain in capacity through Luckey pot operation is not expected. Highlights of new reactivity information resulting from process, equipment, and analytical data evaluation include:

1. An apparent improvement in powder reactivity is realized with closer agitator to pot spacing, more concentrated feed to the pots (limit not known), slower agitator speed, and degree of approach to complete conversion. Quantitative relationships among the above variables are under study.

2. Powder reactivity variation between pots is minimized by the use of additives. (Car 172 data.)

3. Caking in pots may be less likely with lower agitator-to-pot clearances and at slower agitator speeds. Such caking when occurring during periods of additive utilization (only sulfamic acid tested) is not due to disproportionation of sulfate into the cake.

4. No detrimental effect was observed when continuous feed addition (due to leaking addition valve) was experienced during a Luckey pot calcination with the charge size thus increased from 400 to approximately 600 gallons of 100 per cent UNH.

Acid recovery operations were routine, resulting in recovery of about 1025 pounds (90 per cent of theoretical maximum) of 100 per cent nitric acid in approximately 35 weight per cent acid, per ton of uranium processed, except for a shutdown to replace the T-D-4 (nitric acid fractionator) reboiler coil. The replacement coil, installed April 27, 1954, is the "expendable" corrosion study unit, and includes an additional set of test specimens supplied by A. O. Smith Company. Filter bag failures in X-3 (unloading system) included one (1) Orlon (14 days service, seam stitching failure) and three (3) wool (11, 3, and 5 days service, ruptured bags). Nine (9) filter bags were replaced in X-11 (furnace ventilation) service. Uranium losses included 0.2 per cent in condensate to cribs and 0.9 per cent (recoverable) in acid to tank farms representing about 4.74 pounds of uranium entrained per electric pot calcined, uncorrected for D-1, D-6 entrainment losses and Luckey pot calcination.

Miscellaneous items of significance to the operability and efficiency of the process included an observed increase in pot room radiation level from 25 to 35 mrad/hr during 114-TX processing; recovery of about 1,000 pounds of uranium from filter bags by blending vacuum cleaner recovered powder into the unloading system; transfer of C-2 (224-U sump and tank drain) waste into X-1 (stripper feed tank) on a trial basis without detrimental effect directly attributable to such transfers; measurement of gas-fired eight-foot diameter pot sag at about 0.8 inches essentially all occurring during the temperature change from 225 to 240 C; observation of high radiation levels on interior surfaces of uranium handling equipment typified by 3.5 to 7 rad/hr on interior surface of T-B-4 (stripper) manhole cover to Plate No. 8, and 3 to 23 rad/hr at feed inlet to C-1 (60 per cent UNH) pumps; and an observation made late in the report period that recurrent foaming in the calcination pots might be due to partial failure of T-B-4 upper section thus giving fewer than nine (9) effective plates. A qualitative examination of dF attained across 224-U indicates about 0.55 (arithmetic 3.6) for ruthenium. A small portion (less than two per cent in pot feed) of Redox silica gel contacted UNH was processed without incident.

REDOX PROCESS TECHNOLOGY

The Redox Plant production commitment for the month was exceeded on May 21, 1954. Three shutdowns were effected: (1) to replace a failed IAF Control valve, (2) to flush the IA, IS, and 2D Columns, and (3) to divert the neutralized salt waste stream from "S" to "SX" Underground Storage Tank Farm. Process performance was normal with the use of a permanganate oxidation of IAF, three Uranium Cycles, and three Plutonium Cycles. Two IAF batches were oxidized with sodium dichromate (vice potassium permanganate) with resulting lower decontamination factors. Recovery of plutonium from 231 and 234-5 Building supernatant solutions was continued with process modifications to the IAF oxidation procedure as necessary to compensate for the presence of reducing agents in these solutions. The dual-scrub 2D Column flowsheet was found to be comparable to the single scrub flowsheet in uranium decontamination and waste losses.

Process Performance

Decontamination performance and waste losses have been normal throughout the month as indicated in the following table:

> Period covering May 7 to 13; processing approximately 87 day "cooled" metal at a rate of 7.0 tons uranium per day with permanganate oxidation of IAF and partial scavenging with manganese dioxide.

Cycle	Gamma Decontamination Factors (dF) U	Pu	% to Waste U	Pu
Head-End	0.1	0.1	0.01	0.04
First	3.7	3.9	--	--
Second	1.9	2.4	--	--
Third	1.0	1.1	--	--
Overall	6.7	7.5	0.65	0.55

During the first few days of the month two sodium dichromate-oxidized IAF batches were processed through the extraction battery. These batches were processed in order to produce plant product solutions containing high ruthenium concentrations for use in the current laboratory development program on ruthenium removal in Redox. The decontamination performance was as follows:

Cycle	Gamma Decontamination Factor (dF) U	Pu
First	3.5	4.0
Second	2.1	1.7
Third	0.8	1.0
Overall	6.4	6.7

The 3EU concentrate and the 3BP gamma activities were at least two and six times greater, respectively, than those with permanganate-oxidized IAF batches. Five batches of 3EU Uranium were diverted to lag storage for blending and 167 gallons of 3BP solution were reworked through the 2nd and 3rd Plutonium Cycles because of the excess gamma activity.

The Redox Plant was shutdown on May 14 for water flushes of the IA, IS, and 2D Columns because of indicated flooding and excessive activities in the uranium solutions. During the shutdown of the dual-scrub 2D Column according to a new procedure, apparently the specific gravities of the organic and aqueous phases at the interface became equal, and the accumulated interface "crud" was displaced to the 2E Column. Following the start-up of the plant, the activity associated with this material caused nine E-12 batches (averaging gamma ratio of 8.5) to be out of specification and require processing through the temporary silica gel installation. During a subsequent shutdown (to repair leak at 241-S Diversion Box), although the shutdown procedure was slightly modified, a similar effect was noted. However, this time the 2E Column and 2EU Concentrator (F-5) were flushed with nitric acid, and only two E-12 batches were above specification. Additional modifications are to be incorporated in this dual-scrub column shutdown procedure. These two displacements of the 2D Column interface material to the 2E Column were primarily responsible for the slightly inferior uranium decontamination experienced during the month.

The temporary silica gel adsorber system for removal of zirconium and niobium was placed in service on May 14. This system consists of two, 55-gallon, series-connected drums packed with 14-42 mesh silica gel; a three gallon per minute steam jet is used to transfer solution through the beds from 204-2 to

204-1 tank. Approximately 15,800 gallons of UNH solution (about 50 tons of uranium) (144 bed volumes) were processed through the beds before they were regenerated in order to reduce the radiation level at the top of the first drum (3600 mr/hr indicating considerable filtration of active solids). The average gamma ratio of the feed solution was 6 (ca. 70 per cent Zr-Nb) and that of the effluent 2.4 (ca. 40 per cent Zr-Nb) or less. There was no indication of breakthrough of the beds when they were regenerated.

Feed Preparation

The dissolvers were charged with uranium having an average pile exposure of 613 (533-734) MWD/T. The scheduling of coating removal and dissolving to minimize the emission of ammonium nitrate from the stack has been continued. The C-3 Silver Reactor was given a scheduled regeneration on May 24, 1954.

All IAF batches (except HE-35 and 36 for April) were oxidized by a permanganate Head-End treatment procedure using chromic nitrate as the reductant. The "catalytic kill" technique was used to reduce residual permanganate following oxidation, and partial scavenging of IAF with approximately 0.008 M MnO_2 was employed. Increased quantities of 231 and 234-5 Building supernatant solutions have required that two additions of this material be made to the metal solution during the Head-End step. The first recycle addition is made at the start of the Head-End procedure and the second recycle addition, if necessary, is made after the oxidation period. A decrease in scavenging was noted whenever 231 and 234-5 Building supernatant solutions were added after the oxidation. Therefore, the Head-End procedure was modified to allow the reductants in the second recycle addition to replace the chromic nitrate for "catalytic kill", and the chromic nitrate for dissolution was also reduced in an amount proportional to the amount of supernatant solution added. The above modifications have allowed adequate scavenging.

The establishment of maximum water reflux in the H-4 Oxidizer tower before permanganate addition has proven to be beneficial in the control of ruthenium emission from the stack.

A leak in the H-4 Oxidizer coil was discovered on May 20, during the shutdown. The leak is not yet large enough to hinder the Head-End procedure, and plans are being made for replacement of the vessel during the Phase II changes in June.

Uranium Extraction and Decontamination

Nominal solution compositions of the ORNL June, 1949 (acid-deficient) flowsheet were employed for the First Extraction Cycle. The Second and Third Uranium Cycles were operated on dual-scrub and concentrated feed flowsheets. The UNH concentration in the 2DF was increased from 2.45 M to 2.7 M UNH to allow a reduction in the 2.5 M $Al(NO_3)_3$ flow so that the temporary 2DS piping could supply adequate aluminum nitrate. Although the 2D Column was operated on a dual-scrub flowsheet during the month, the decontamination performance was not appreciably different from that of the single scrub 2D Column flowsheet.

Waste Processing

During the report period, numerous changes in the routings of the neutralized salt waste, coating wastes, and H-2 centrifuge cake wastes were made. The H-2 Centrifuge cake wastes are now combined with the salt waste in the D-9 Waste Sampler Tank and routed to 101-SX tank. This change was made to eliminate the use of a separate line to the Underground Storage Tank Farm for the centrifuge cake wastes.

The new three-foot diameter test tank located inside the 101-SX Tank has been filled with waste. Vertical temperature traverses are being made every two days and currently the maximum temperature is 125 F in the bottom 10 feet of the tank.

During the month several pressure surges in the 101-S Underground Storage Tank occurred varying from 20 minutes to about four hours duration and from about one to 34 inches of water maximum pressure. These eruptions were the first noted since March 2, 1954.

IN-LINE INSTRUMENTATION

Fabrication of a portable, automatic, strip-filter sampler for the Redox Plant has reached 80 per cent completion in the Technical Shops. This sampler will aid process investigations with regard to the cause of excessive stack-gas activity.

A continuous gamma scintillation detector has been recommended for the monitoring of Purex Plant 30 per cent nitric acid prior to transfer to the external vacuum fractionation facilities. A total of ten instruments of this type have been accepted for Purex use to date.

Plans for installation of gamma monitoring instruments at the Hot Semiworks have been sufficiently defined to permit the detailed listing of specific jobs to be performed, and wiring and conduit specifications for all in-line instruments have been frozen. The target date for completion of the program is August 1, 1954.

TBP Plant pH meters and RCU gamma monitors performed satisfactorily throughout the month. Frequent sampler jet plugging and amplifier trouble characterized the operation of the RAF uranium photometers, and the performance of recently modified RAW polarograph units was marked by intermittent plugging of dropping mercury electrodes and "hashy" polarograms.

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

Isolation Building (Task I)

A redesigned filter stick for supporting a 1/16 inch thick porous Kel-F filter medium (nominal 15 micron pore size) was installed in the P-2 tank, cell 3. The new filter stick is supported by perforated stainless steel plate and a wire screen to give it added strength. With a vacuum tight system the filter

rate for thickening S-Plant plutonium(IV) oxalate slurries was about one liter per minute but difficulty with vacuum leaks has caused slower rates. The particle retention has been satisfactory as indicated by the normal loss to the filtrate.

The successful decomposition of excess oxalic acid in oxalate filtrate solutions by reaction with sodium dichromate has eliminated the manganese dioxide solids problem which forms when potassium permanganate is used for this purpose. S-Plant plutonium(IV) oxalate filtrates decomposed by this method are being returned to the S-Plant process without causing any significant irregular performance there. A significant decrease in the amount of manganese in finished castings is attributed, at least partially, to this change in procedure. The 50 per cent sodium dichromate solution is also being added in place of potassium permanganate to complete the hydrogen peroxide decomposition of T-Plant supernatant solutions.

Iron impurity in casting samples has increased from 150 to 500 ppm, average, between 3-24-54 and 5-18-54. The change from 7.5 Kg of 1.5 M nitric - 0.05 M oxalic acid solution to 2.5 Kg minimum of distilled water for washing plutonium(IV) oxalate cake and/or the corrosion of sintered stainless steel filter sticks are possible causes for the increase in iron impurity. An additional 1.0 Kg of distilled water is to be added through the spray ring, increasing the minimum wash to 3.5 Kg. The decreased washing may have also been partially responsible for an earlier seven-fold increase in manganese impurity in casting samples.

Dry Chemistry (Task II)

Based upon fluoride color, 6.2 per cent of all runs through Task II required rehydrofluorination. This compares to 16.9 and 11.5 per cent for March and April, respectively. All runs were processed using the 450 C maximum baffle temperature and preheated process gases. Although blue powders (containing significant amounts of PuF_3) continue to dominate, the number of green powders (cause for rehydrofluorination) has decreased significantly as indicated by the data above.

Reduction (Task III)

The plutonium yield from reduction of plutonium fluoride powders in Task III averaged 98.9 per cent. The average yield for March and April was 98.25 and 98.6 per cent, respectively.

With special care taken in choosing buttons for canning, viz., canning only smooth buttons and omitting those which oxidize readily, the quality of the buttons shipped off-site has improved. Discrepancies between the shippers and receivers reported plutonium content were in relative agreement for the last shipment.

Casting (Task IV)

Coating (Task VII)

DECLASSIFIED
WITH DELETIONS

Final Inspection and Quality Control

The drawings for the new final inspection facilities, part of Project CG-551 "Expansion of Building 234-5 Facilities," have been approved. Machines have been transferred from the maintenance shop area to provide space for these new facilities and orders have been placed for a part of the new equipment required.

RECUPLEX CONSTRUCTION

The installation of all vessels for the Reception and Blending Hood has been completed. Approximately 24 per cent of the Solvent Extraction Hood vessels have been installed, and an additional 40 per cent are available for immediate installation. Process and service piping will commence upon the receipt of valves.

234-5 DEVELOPMENT

AT Solution Studies: Neutron Emission

Neutron counting of plutonium nitrate (AT) solution in sample cans has been initiated in an effort to correlate the neutron count of the solution with the neutron emission rate (n/g-s) of the plutonium. This program is being undertaken in an attempt to establish a basis for testing the quality of low g/T plutonium nitrate to be shipped off-site.

Calcium Plutonium(IV) Fluoride

Plant scale testing of the calcium plutonium(IV) fluoride process has continued, with the reduction of a double batch (625 grams plutonium) of the double salt. The fluoride was precipitated from AT solution and gave metal of satisfactory purity, with a reduction yield of 93.9 per cent.

Task I Precipitation Vessel

Investigation is being made of the use of an air-lift, in place of the propeller-type recirculating pump, in the Task I precipitation vessel. Good circulation and excellent agitation have been achieved by admitting air, in pulses, into the draft tube near its lower end, thus causing the solution to cascade over the weirs at the upper end of the draft tube.

Prototype Installation

Hoods for the prototype, Task I and Task II equipment have been moved into the laboratory and are awaiting installation.

Plutonium Metal-Nitric Acid "Reaction"

An attempt to dissolve ca. 300 grams of plutonium metal turnings in nitric acid resulted in a violent reaction and a flash fire, which produced sufficient heat to fuse the unreacted metal. The resultant pressure rise inside the gloved hood forced hood air and dust through several small holes and out into the room, producing wide-spread contamination of Room 179. Serious personnel contamination was not encountered and the room was cleaned up without incident.

"Z" Area Technical Manual

The Plutonium Purification and Fabrication Technical Manual has been turned over to Technical Publications. Final typing and proof reading are nearing completion, and the preparation of a subject index is in progress. Initial issuance does not include the portion on the Recuplex Process, which will be added later.

ANALYTICAL LABORATORIES

General Chemical Laboratory

Testing of apparatus for the determination of oxide in sodium-potassium alloy has been completed and samples may now be analyzed. During the month thorex methods were applied to both aqueous and organic (30 per cent TBP in shell spray base) samples containing thorium, uranium and nitric acid in widely varying thorium uranium ratios. The analysis of thorium by versene (Di Sodium salt of Ethylene Diamine Tetra Acetic Acid) titration proves to be a valuable method for the systems under investigation as neither uranium nor nitric acid interfere except in extreme quantities. The use of "Dowex A-1" resin for the separation of uranium and thorium has been demonstrated. The separation is sharp and quantitative, however, it is time consuming and is being used only when the following conditions prevail:

1. Uranium is to be determined by the Chromous Sulfate method.

2. Thorium is to be determined colorimetrically (Thoron) and the uranium in the sample exceeds 2 mg.

3. Thorium is to be determined by Versene titration and the ratio of uranium to thorium exceeds 10:1.

Radiochemical Laboratory

The Beta Spectrometer has been used to count greater than 3.0 Mev Ru-Rh-106 betas in the presence of mixed fission product samples. This work is continuing to obtain a direct comparison of work performed in this manner with assay numbers obtained by chemical separation followed by normal counting procedures. To date the spectrometer has produced satisfactory data and a considerable saving of time. An absorber technique suggested in KAPL-631 was also employed on samples of known history for Ru-Rh-106. The results obtained were satisfactory and again the time saved was considerable when compared to the conventional method. Gamma scans with clearly resolved photo peaks and no unusual amount of Compton continuum were obtained by scanning Ru-Rh-106 through zero to two inches of lead absorber.

Spectrochemical Laboratory

At the time of the original move from Building 3706 to Building 325 the B & L Spectrograph was left with the Manufacturing Laboratory to assist them in the

analyses of P-10 target slugs. This work is essentially complete and the B & L Spectrograph is now in operation in the 325 Building Spectrochemical Laboratory. The Baird Spectrograph is now equipped to handle samples employing the copper spark technique.

Mass Spectrometry and Water Quality Laboratory

A series of samples containing oxides of nitrogen and hydrogen were analyzed. Under present operating conditions an accurate hydrogen analysis can be produced but modification of the sampling procedure and sampling system would be required to approach a better analysis of the oxides of nitrogen. These modification in all probability will not effect the accuracy of the present hydrogen figure. Some of the difficulties encountered in analyzing oxides of nitrogen include reaction with water when sampling, reaction with mercury in the sample manifold, reaction with the filament and other reactive materials in the spectrometer producing CO, CO_2, N_2, O_2, H_2O and nitrosation and/or nitration, different equilibrium constants under mass spectrometer conditions, e.g., $N_2O_4 \rightleftarrows 2NO_2$ is 99.9 + % NO_2 in the spectrometer (See Analytical Chemistry Vol. 25, p. 134, September, 1953), and unstable cracking patterns. P-10 operations were suspended during the month and excess personnel were transferred to other functions, one to a permanent assignment and three to temporary assignments. Operations in the water laboratory attained a normal volume.

Work volume statistics for the Analytical Laboratories are as follows:

	April		May	
	Number of Samples	Number of Det'ns.	Number of Samples	Number of Det'ns.
Research and Development				
Applied Research	1142	2078	1385	2456
Pile Technology	185	1307	221	1362
Fuel Technology	111	1840	38	756
Separations Technology	386	775	440	799
Process Assistance	248	2302	113	1027
Others	94	691	48	202
Total	2166	8993	2245	6602

INVENTIONS

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

INVENTOR	TITLE
G.V.N. Packer	A device for pumping liquid when conditions require a varying pump intake suction up to 29.9 inches of mercury.

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

VRC:bp

June 9, 1954

APPLIED RESEARCH SUB-SECTION

MONTHLY REPORT

MAY, 1954

Applied Research Sub-Section

VISITORS AND BUSINESS TRIPS

Max Erb, Erb & Gray Company, Los Angeles, California, visited Hanford on May 6-7 to inspect equipment.

W. V. Cummings and K. R. Merckx attended the AIME Conference in Portland, Oregon, on May 1, where they presented technical papers.

R. H. Moore spent May 3 at Mallinckrodt Chemical Works, St. Louis, Mo., discussing a dry chemistry problem.

R. E. Connally spent May 3-6 at the Detectolab, Inc., Chicago, Illinois, inspecting a 20 channel pulse height analyzer; May 6 visiting the Radiation Instrument Development Laboratory, Chicago, Illinois; and May 7 visiting the Nuclear Instrument and Chemical Corp., Chicago, Illinois.

H. R. Schmidt visited at KAPL on May 12-14 to discuss process chemistry.

A. H. Bushey visited the Kaiser Aluminum Plant, Spokane, Washington, on May 14 to speak before a joint ACS-AIChE meeting.

R. S. Rosenfels attended the Pacific Northwest Vendors' Show in Seattle, Washington, on May 19-20.

. Alkire spent May 20-21 at Argonne National Laboratory, Lemont, Illinois, discussing mass spectrometric problems.

L. D. Turner spent May 19-20 at ORNL, Oak Ridge, Tenn.; May 21 at the ANP Project, Cincinnati, Ohio; and May 24-25 at KAPL, discussing metallurgical problems. May 26-28 were spent at Brookhaven National Laboratory, Upton, N.Y., where Mr. Turner presented a paper at the Information Meeting on Hot Laboratories.

C. L. Boyd visited at Argonne National Laboratory, Lemont, Illinois, May 24 and at WAPD, Pittsburgh, Pa., May 25, inspecting equipment at hot laboratories. May 26-28 were spent at Brookhaven National Laboratory, Upton, N.Y., where Mr. Boyd presented a paper at the Information Meeting on Hot Laboratories.

L. F. Miller spent May 24-25 at KAPL to inspect hot laboratories and handling equipment for analytical facilities; he spent May 26-28 at Brookhaven National Laboratories, Upton, N. Y., where he presented a paper at the Information Meeting on Hot Laboratories.

J. F. Gifford attended and presented a paper at the Information Meeting on Hot Laboratories at Brookhaven National Laboratories, Upton, N.Y., on May 26-28.

J. E. Faulkner visited at Los Alamos Scientific Laboratory, Los Alamos, N.M., on May 26-28 to discuss critical mass problems and experimental physics problems.

W. J. Ozeroff spent May 26-28 at Los Alamos Scientific Laboratory, Los Alamos, N.M., discussing critical mass problems and theoretical physics problems.

. . Wick spent May 26-28 at Los Alamos Scientific Laboratory, Los Alamos, N.M., discussing plutonium and uranium metallurgy.

Applied Research Sub-Section

ORGANIZATION AND PERSONNEL

Personnel totals as of May 31 were as follows:

	Exempt	Technical Graduates		Non-Exempt	Total
		Permanent	Rotational		
Physics Unit	27	1	1	6	35
Metallurgy Unit	43	0	1	24	68
Chemistry Unit	50	1	3	16	70
Administration	1	0	0	4	5
Total	121	2	5	50	178

PHYSICS

Lattice Physics

Oralloy is used on an industrial scale in Hanford for two purposes. One of these is the production of useful isotopes, mainly tritium; the other is the enrichment of the outer regions of the piles to "flatten" the neutron distribution and thereby raise the power level. In these applications the Oralloy is used in the form of J slugs (7% Oy, 93% Al) and C slugs (4% Oy, 96% Al).

Available lattice and other data on J and C slugs are meager so that substantial uncertainties exist in the knowledge of quantities such as critical size and conversion efficiency which are needed for pile operation and safety. For this reason, a series of experiments designed to measure the constants of Oralloy slug lattices has been started. Preliminary results on the buckling of three lattices using J slugs have been obtained. These are given below:

Buckling in Units of $cm^{-2} \times 10^{-6}$ of J Slug Lattices

Lattice Spacing	Dry Buckling	Wet Buckling
8-3/8	907	907
5-3/16	1325	1544
4-3/16	1366	1800

It will be seen from these data that the cross-over point of the wet and dry buckling occurs at a lattice spacing of 8-3/8 inches--a surprising result since the cross-over spacing for natural uranium is less than this, viz., ca. 7 inches. The calculation of the migration areas and other constants of these lattices is not yet complete so that a quantitative interpretation of these results cannot be given at present.

A supply of standard Hanford slugs with a 0.5 inch axial hole has been obtained. The bucklings of these slugs will be measured in several lattices in order to determine the feasibility of using such slugs in present piles. This type of slug is of interest because it promises to be more stable at higher power densities than the solid slug.

Applied Research Sub-Section

Measurements on lattices containing up to nearly five times as much cooling water as the H-Pile lattice showed that the reactivity effects of the additional water were not proportional to the added amount of water. These measurements had been made with small slug lattices and, because of this lack of proportionality, cannot be easily extrapolated to larger slug sizes. Accordingly, measurements are being made of the reactivity effect of larger cooling water contents in lattices of standard slugs. Measurements in dry lattices have been completed; measurements in wet lattices are under way.

In connection with the investigation of methods of producing U-233 in Hanford piles, measurements are being made of the bucklings of lattices containing J and Q (thorium) slugs. Only a preliminary value for the dry buckling of the 8-3/8 inch lattice is available at present (143×10^{-6} cm^{-2}).

Nuclear Physics

The energy range of the crystal neutron spectrometer has been extended to lower energies by means of a beryllium filter. It is now possible to make measurements at 0.005 ev. In computing pile cross sections from monoenergetic cross sections, it is necessary to average the monoenergetic values over the pile spectrum. In this averaging process, the contributions from the lower energies are important since cross sections rise as the energy is decreased, approximately as 1/v.

Measurements have been completed for U-235 and Pu-239. These are given below:

$$\frac{\sigma_f^{25}(.005 \text{ ev})}{\sigma_f^{25}(0.1 \text{ ev})} = 5.427 \pm 0.036.$$

$$\frac{\sigma_f^{49}(.005 \text{ ev})}{\sigma_f^{49}(0.1 \text{ ev})} = 3.632 \pm 0.046.$$

The content of Pu-240 in product plutonium is governed by a rather complicated relationship between flux, time of irradiation, values of cross sections, and other quantities. If, however, flux and time of irradiation are left constant, then Pu-240 content is determined mainly by the ratio:

(fission cross section of U-235/capture cross section of Pu-239)

since the numerator determines the amount of Pu-239 produced while the denominator determines the amount of Pu-240 produced. The Pu-240 content is, of course, dependent on other cross sections as well, but the point here is that the principal dependence is on the ratio given above. Since accurate values of these cross sections are available, it is possible to estimate how the Pu-240 content would change if the temperature of the neutrons (which is controlled mainly by the graphite temperature) is changed. Preliminary estimates have been made and these give the following result: if the temperature is changed from 700 K to 550 K, then an increase of 20% in exposure would leave the Pu-240 content unchanged.

This result may have application to the operation of Hanford piles. The temperature of the graphite may be lowered by the use of helium as a pile gas. Irradiation damage to graphite, produced as a result of the lower temperatures, may be annealed by short periods of high temperature operation with carbon dioxide as the pile gas.

Plant Problems in Physics

A survey is being made of available critical mass data to determine the types and sizes of vessels required for the safe handling of solutions of slightly enriched (1-2%) uranium. Calculations show that safe vessel sizes change very rapidly with enrichment in this region of enrichments. A comparison of these calculations with experimental results on slightly enriched lattices confirms the general features of the calculated results. It is hoped that it will be possible to design a few critical experiments which would supply sufficient data to cover critical mass problems in this range of enrichments.

CHEMISTRY

Purex

The success attained with Purex extractions at 50° prompted study of systems at still more elevated temperatures. Mini runs simulating HA column extractions were carried out with 30% TBP-ultrasene at 20% of Hanford fission product level according to the HW #3 Flowsheet. Gamma decontamination was improved four-fold at 70° as compared with 25° operation. Of particular significance is a 30-fold improvement in ruthenium decontamination; Nb DF's were improved seven-fold, and that for Zr remained unchanged. The uranium profile was normal at the higher temperature.

Equilibrium data at 70° (organic/aqueous) for the system: aqueous-30% TBP in ultrasene, showed a negative temperature coefficient for uranium as expected. Eå is lowered three-fold at the higher temperature, although it is expected that modified flow rates and higher TBP concentrations will neutralize this effect. Nitric acid has a slightly positive temperature coefficient. Stability tests with TBP at 70° are under way. Stability tests for ferrous iron in 1BX concentrations show a half-life of 20 hours at 50 C and three hours at 60 C, thus indicating a limiting 1B temperature of 50°.

Another approach to modified Purex flowsheets is that employing aluminum from jacket dissolution as a salting agent with the hope of reducing acid concentrations sufficiently to obviate acid recovery. H cycle batch countercurrent extractions employed a feed of 0.3 M acid, 0.45 M Al, and 1.5 M U in place of the standard 2 M acid. The acid concentration of waste was 0.65 M at 25° and 0.53 at 50°. This is a smaller HNO_3 loss than that of the standard acid recovery operation which is designed to remove only 60% of the 2.2 M acid in the waste. Uranium loss was low (0.02%). Plutonium pinched at the feed point, however, thus indicating high Pu losses; it is believed that this difficulty can be overcome by higher extractant flow and greater TBP concentration at 70°.

Irradiation damage to CCl_4 is being examined in consideration of flowsheets employing this material as diluent. Carbon tetrachloride and TBP, both separate and in mixtures with H_2O, were irradiated in a pile basin to exposures of 10^5-10^7 R.

Applied Research Sub-Section

Qualitative tests to date show chloride, phosgene, and hexachlorethane as CCl_4 degradation products and alcohol as a TBP degradation product.

One laboratory extraction experiment was carried out to provide a comparison of the HW #2 and #3 Purex Flowsheets. The latter, operating at 68% saturation in the organic phase and with a dual HA scrub, appears to yield a 2- to 3-fold poorer beta-gamma decontamination factor.

Previous laboratory tests yielded discordant results in the relation between degree of organic phase uranium saturation and decontamination factor. A repeat experiment was carried out using a single feed to establish the entire relationship. It involved a continuous 16-hour run starting under conditions of the HW #2 Flowsheet at 20% of Hanford full level. The results were consistent and showed an adverse effect on beta and gamma decontamination by a factor of 15 when the degree of saturation was dropped from 75% to 45%. The adverse effects on individual fission products were Zr, 60-fold; Ru, 16-fold; and Nb, 3-fold. The results portray the situation well, although the quantitative figures are undoubtedly a function of the feed solution history.

Thorex

Further attempts to dissolve ThO_2 were carried out with portions of a prepared slug fused at 600-800 C. No visible attack of the oxide was evident, and no thorium was obtained in subsequent solution after fusions with lead, caustic, sodium carbonate, sodium pyrosulfate, or ammonium persulfate. A slight attack occurred upon fusion with sodium fluoride.

Under conditions of high thorium concentration Thorex systems are known to form a third phase. Threshold concentrations in 30% TBP diluent were established greater than 60 g/l Th - 0 g/l HNO_3, or greater than 10 g/l Th - 65 g/l HNO_3. Higher temperature and/or higher TBP concentration increased the threshold levels.

Ruthenium

Fourteen separate Redox dissolver solutions and 14 HLMO samples have been examined for ruthenium behavior by several chromatographic techniques. Frequent cases of highly inconsistent behavior were observed. In eight cases only 5% of the Ru appeared as a solid, but in two other cases the majority appeared in this form. A similar pattern appeared with HLMO solutions. In most cases Ru in dissolver solution did not migrate with hexone, but in one case the majority of the element migrated with this solvent. Examination of the complete data and comparison with process performance are expected to reveal considerable information regarding this troublesome fission product.

Previous experience showed the beneficial effect of SO_2 in minimizing Ru extraction. A sample of synthetic Purex HCP was concentrated under conditions of SO_2 saturation. The extraction coefficient of Ru by this SO_2 treatment was lowered three to four times. No further work is contemplated since metallurgy studies have quite clearly shown the corrosive properties of SO_2.

Applied Research Sub-Section

Isotope Separation

Exploratory isotopic studies are in progress using uranium as a stand-in for plutonium. Two techniques appear to be giving positive results. The moving thermal zone technique has yielded a 25 content of 0.708% versus the original 0.713%. An homogeneous precipitation technique applied to normal uranium (0.711% U-235) yielded a product containing 0.706% of the isotope; UNH is dissolved in glacial acetic acid, and diethyl oxalate is then added. The latter hydrolyzes to allow the slow precipitation of uranium oxalate. The first 1% of this precipitate had the above 235 content. Precise isotopic analyses are difficult to obtain at Hanford since the work must be sandwiched into the production analytical schedule. As a consequence, umpire analyses have been requested from K-25.

Further isotopic work under way involves extraction systems employing the U(III)-U(IV) equilibrium, and also distribution of U(IV) into TBP.

Analytical Development

The light scattering microphotometer continues to be of extreme value in the control of pile water turbidity and will be employed as a replacement for colorimetric Fe and Al determinations; the latter are considerably slower and are less satisfactory for control of alum-treated water. The turbidity measurements show incipient filter breakthrough and allow more intelligent chemical treatment, which results in better film formation on the filters. In addition, there is strong evidence that a controlled, very low, turbidity retards, if not completely eliminates, film build-up on the pile tubes. During the six weeks of control at the H Area, no pile scrams resulted from pressure build-up, and pressure drops have been extremely constant. Water plant personnel estimate that complete control by this new technique will provide $10,000 annual saving in analytical time and $20,000 annual saving in the cost of water treating chemicals.

An improved determination of copper in pile water employs the colorimetric reagent, Neo-cuproine. The sensitivity limit for unconcentrated water is lowered from 40 to 4 ppb and improved precision results.

Plutonium isotopic analyses in support of the isotope separation program are promised by the first success in resolving Pu-239, 240, 241 with the mass spectrograph. The instrument conditions providing this resolution involved a narrower slit and a reduced time constant on the collector amplifier system. The analytical precisions for the respective isotopes are ± 0.2, ± 0.2, and ± 0.03% absolute; improvements should result from further studies.

A sensitive, accurate, and rapid flame photometric procedure for the determination of TBP was established for use by the Analytical Service Laboratory. Anion exchange resins were found suitable for recovering sub-microgram quantities of uranium from thorium, thus providing an analytical technique--and possibly a process technique--for Thorex work. Coulometric procedures for determining acid in various Recuplex streams were tested and made available for control purposes. Other analytical problems involve study of a fluxing procedure for recovering hydrogen from zirconium; inspection of the 20 channel pulse analyzer being purchased from the Detecto Laboratories; assistance to the 222-S Laboratory in tracking down mass spectrometric difficulties; and continuation of the standard sample program.

Applied Research Sub-Section

In-Line Analysis

In the in-line analysis installation for the Hot Semi-Works, the three master programmer switches are designed and all materials have been ordered; shop drawings for eight operating consoles are approximately 80% complete, the recorders are on order, and the pH meters have been received. In the group of individual sensing units, two completed prototype gamma monitors are under test; the Pu gamma photometer sensing unit is complete; revision prints of the alpha printer monitor are about 50% complete; and drawings of the uranium photometer are 60% complete, with a prototype under test. In addition, a prototype of the uranium photometer power supply is constructed and being tested; shop drawings of the uranium polarographic monitor and of the pH cells are complete; and the plant electrical conduit, wiring, and air-line lay-outs have been completed and a tabulation of wiring requirements has been submitted to the contact engineer.

A modified form of the Hot Semi-Works gamma monitor is under construction for introduction into the Redox Process. It will monitor gamma in the 3DF stream, thus providing third cycle gamma decontamination data. Design concept work was completed on a gamma photometer to be used for monitoring uranium concentration in the molten UN feed to the calcining pots in the UO_3 plant.

Equipment Design

Design effort has been directed principally toward in-line analytical instruments. Other work included preliminary designing of a hot wafer dissolver and associated Mini units for installation in the 325 Building; completion of detailed designs for a cobalt gamma source; design of a general purpose brickpile to be employed for hot thorium dissolvings; detailed designing of an enclosed arc-spark stand to allow spectrographic analysis of radioactive samples; and design of a modified automatic photometric comparator to be employed for uranium extraction rate studies.

Decontamination Services

One million gallons of "retention" waste were processed to ground. Fifty-five thousand gallons of "crib" level waste were transported to 200 W Area for disposal.

Vibrometer tests were conducted in the 325 Building to learn what sources of vibration affect the emission spectrograph. The primary source was found to be the air sampling exhaust. A proposal is being studied which would extend the exhaust pipes a short distance from the building and outlet the exhaust through a muffle attached to a small tower.

The alkali metal storage building southeast of Building 3706 was removed as part of the area clean-up campaign. Excess amounts of the metals were disposed of; the balance was repackaged and is now stored in a locked lead vault in Building 325.

All other functions of the group were accomplished in a routine manner.

Applied Research Sub-Section

METALLURGY

Irradiation Effects on Uranium

The program to determine the effect of irradiation on the mechanical and physical properties of uranium is continuing. The mechanical property data reported last month showed that a post-irradiation anneal at 400 C was not effective in restoring the room temperature ductility of the irradiated metal. Equipment and apparatus are being assembled to test irradiated samples after a 700 C heat-treatment and also to test at elevated temperatures. Additional test specimens are being canned for an extension of this program. The special irradiations, to be conducted at HAPO and the MTR, will be carried to exposures of approximately 75, 150, and 1200 MWD/T. The test specimens are being canned for a low temperature (35 C) irradiation at HAPO and an elevated temperature (approximately 400 C) irradiation in the MTR.

The specimens for the above MTR irradiations will be canned in a Zircaloy capsule filled with NaK. Two prototype Zircaloy-2 capsules containing liquid NaK and a polished uranium specimen have been subjected to a 250 and 500-hour autoclave test. External examination of these capsules during the test period revealed no indications of tendency to failure. One such capsule has been opened and its contents examined. The polished uranium surface of the specimen had corroded only slightly in the NaK environment. To determine experimentally the nature and extent of reaction caused by water entry into such a capsule, a small hole will be drilled into the second capsule, and the capsule will be exposed to a hot water environment.

The four high temperature specimen assemblies which were irradiated in B Pile for 26 hours were sectioned last month and each rod was photographed in position. Three of the four assemblies have been cut a second time, cutting off the threaded base of the uranium and allowing the rods to be removed from the assembly. The three rods thus far removed appear to be in good condition, i.e., no warping, bumping, or cracking, with exception of the tapered rod which had operated at a calculated maximum temperature of 900 C. The tip of this rod had spalled during irradiation. Metallographic examination of the rods will be initiated as soon as possible.

Zirconium Metallurgy

Two Zircaloy-2 specimens which have been exposed to 10% He-90% CO_2 atmosphere in a dry process channel at F Pile for two months at a temperature believed to exceed 600 C, show a surprisingly small degree of oxidation on brief visual examination. Radiometallurgical examination, viz., weight gain, dimensional change, slow bend test for ductility, is planned.

Attempts to rationalize the growth of zirconium during ex-pile reaction with air have led to the theory that the growth mechanism involves a dilation of the surface reaction product causing plastic yielding of the underlying metal. To test this theory, 1/8-inch thick strips of zirconium were given ground and smooth surface finishes and then heated in air at 700 C. Pieces lapped smooth on both sides remained flat and straight. However, pieces lapped on one side and coarse ground on the other bowed considerably with the smooth surface on the convex side as predicted. Further, on heating in air a piece of Zircaloy-2 having a saw-tooth surface profile, cracks developed in the oxide at the apex of each tool mark

whereas none occurred at their base. Thus, a reason is suggested for the observed greater growth of zirconium in the rolling direction: grooves and scratches are produced parallel to the rolling direction. Cracking of the oxide at the apex of these grooves reduces the dilating force perpendicular to rolling but has little effect parallel to this direction.

The embrittlement of Zircaloy-2 by hydrogen is being investigated using impact and stiffness testing methods. Impact specimens were homogenized at 1000 C for one hour, then furnace cooled. During the furnace cooling one specimen had approximately 200 ppm of hydrogen added. Another specimen was furnace-cooled with no hydrogen added. These and two as-received specimens were impact tested in a 240 ft-lb Charpy machine with the following results:

Conditions	Temperature °C	Impact Strength, ft-lb
As-received	25	13
As-received	190	26
Furnace-cooled	25	9.5
Furnace-cooled-200 ppm H_2	25	4

Fractures differed markedly due to grain coarsening and change in mode of fracture. The coarse grained, furnace-cooled specimens were examined metallographically at 250 X. The fracture in the sample containing hydrogen was predominantly intergranular while that of the coarse grained specimen without added hydrogen was predominantly transgramular. Several specimens of Zircaloy-2 containing known amounts of hydrogen have also been tested in a cantilever beam type stiffness tester at four different temperatures. As expected and in confirmation of the foregoing impact tests, preliminary results indicate lower ductility and higher ultimate strength with increasing amounts of hydrogen and with decreasing temperatures.

Metallurgical Techniques

A new type vacuum cathodic etching unit which utilizes a zirconium specimen mount sealed directly to glass has been tested and performs satisfactorily. Several types of uranium specimens, each 1.4 inches in diameter, have been cathodically etched with krypton at a pressure of 75 psi, at 3000 volts, and at a current density of about 3 ma/sq.in. Transverse specimens of alpha rolled, beta heat-treated, and gamma extruded uranium previously polished mechanically were etched for a one hour period and show a surface suitable for macro and high power micro photography. The alpha rolled specimen showed a definite cross of similarly oriented grains; the beta heat-treated specimen showed some indication of such orientation; and the gamma extruded specimen showed no evidence of an orientation effect caused by a particular fabrication process. Faxfilm replicas of these specimens have been taken, have been shadowed obliquely with aluminum, and have been examined with transmitted illumination. The impurities in the metal in the form of inclusions are not dislodged and etch at a much slower rate than the matrix uranium. Specimens of high alpha rolled uranium are currently being prepared for cathodic etching; these specimens will be studied for orientation effects, as well as micro voids and cracks.

Applied Research Sub-Section

MTR Fuel Element Testing Facility

The ex-pile equipment for the MTR testing facility has been installed in the sub-pile room of the MTR Building. Testing of the equipment and the training of operators by MTR personnel is scheduled to begin early in June, with June 30 scheduled as the charging day.

A group of fuel element specimens were prepared during the month. Three A-blocks were charged with three slugs each, aluminum rod sections being used to position the slugs vertically and to fill up the unused space in the block. After welding the pipe and valves on the A-blocks and leak testing the welds, the assemblies were crated and shipped to the Materials Testing Reactor site.

The cores of eight of the nine slugs were machined from the rods from a single ingot of normal production metal. The material was rolled and salt-bath heat-treated in rod form at FMPC. The slugs were machined at Hanford and a generous sampling of the metal was set aside to determine the chemical and metallurgical properties of the material. The evaluation of the metal is under way.

The first A-block to be irradiated contains the following four-inch slugs, lead-dip canned unless otherwise stated:

(a) A cored slug (3/8-inch core with threaded plugs)
(b) A solid slug
(c) A solid slug canned by the nickel-plate hot press process developed by Fuel Technology.

The second A-block contains a duplicate charge, while the third contains, in addition to a solid slug, two slugs with machined longitudinal notches (45° included angle, 0.010-inch radius and 0.050-inch deep). The purpose of this irradiation is to determine whether the presence of the notches (stress-raisers at the surface) will induce a split-type of rupture.

After canning, the positions of the notches were located by examination of closure radiographs. The notched specimens were then charged in the A-block in such a way that two notches are symmetrically located with respect to the anticipated radial flux gradient.

The flux depression measurements made on a charged A-block in the 305 Pile are now complete and the data have been analyzed. The observed value for the flux depression is 0.38 (depressed flux/original flux) compared with the calculated value of 0.29 (H. Neumann, HW-30390). W. B. Lewis of the Phillips Petroleum Company reports that in MTR program SEP-1, the irradiation of Hanford slugs by Sylvania Electric Products, Inc., the observed value is about 0.33. In MTR position A-40, where the first A-block will be charged, the power generation calculated from these values of the flux depression ranges from 75 kw/ft (0.29) to 100 kw/ft (0.38). The corresponding maximum core temperatures (calculated) are 675 C and 850 C.

Because of the uncertainty in the specific power generation, it is planned to carry out the irradiations as follows. The first A-block will be charged in position A-40. The power generation will be known as soon as the reactor is started up (from the

Applied Research Sub-Section

water flow rate and the temperature rise). If the specific power turns out to be less than about 75 kw/ft, the A-block will be moved up to position A-39 at the next shutdown. If the power generation exceeds 75 kw/ft, the experiment will be continued for three runs, i.e., 9 calendar weeks or about 57 days at full power. The exposure accumulated in this time will be 700 to 950 MWD/T depending on whether the power generation is 75 or 100 kw/ft. In the event of premature failure of a specimen in the first A-block, the second (duplicate) will be charged immediately. If nothing unusual occurs, the A-block containing the notched specimens will be charged on September 1.

The current A-block design is such that after use it must be cut open in order that the slugs may be removed. If the block is to be re-used, it must be decontaminated, a new lower end fabricated, and the cut surface milled for welding. In order to reduce costs, a rechargeable A-block has been designed and is now under construction. The lower end of the block is threaded and will screw into the body of the A-block. A pressure seal will be effected by use of a lead gasket. If it is found that a positive seal can be obtained remotely, the present A-block design will be abandoned in favor of the rechargeable design. A feature of this design that is perhaps even more important than the savings expected is that it will allow re-irradiation of irradiated fuel element specimens; that is, a slug can be irradiated, examined, and then put back in the reactor for further irradiation.

Fuel Element Studies

Reactivity tests have been completed for three uranium-magnesium fuel elements containing 54 volume percent uranium. The test results indicate that a reactivity loss of approximately 1000 inhours would result from a full pile loading of this material in a Hanford pile (infinite K = 1.006). The conversion ratio was calculated to be 0.76 uncorrected for 25 burnout in the spike enrichment zones which would be required to make the lattice operable. With homogeneous enrichment to achieve an operable lattice of infinite K = 1.03, the conversion ratio would be 0.73. Since it is hoped to achieve a volume percentage of uranium of 70-75%, the principal value of the present data is to aid in predicting the lattice properties of the higher uranium content slug. The Physics Unit is engaged in calculations to this end.

Samples of uranium turning compacts cast in pure magnesium and also in an alloy of magnesium - 1.4 weight percent silicon have been corrosion tested in boiling water for a period of 24 hours. The samples of uranium in a pure magnesium matrix were swelled and corroded on the surface. The corrosion on the samples of uranium in a magnesium-silicon matrix was limited to the uranium exposed to the surface. Microscopic examination of the sample indicated the presence of a protective layer which prevented penetration of the water into the interior of the specimen. More corrosion tests are being scheduled for this material.

Attempts to prepare a mock uranium dioxide for reactivity studies by combining uranium chips with powdered magnesium oxide or sodium carbonate were unsuccessful due to separation of the powders. Also, densities were uniformly low, even when using pressures to 60 tsi. However, separate compacting of the uranium gave promising densities, in excess of 8.0, and left voids which could be largely filled with a low viscosity liquid. Requests have been made for liquid perfluorinated hydrocarbons for this purpose to simulate the oxygen in the uranium oxide.

[redacted]

Applied Research Sub-Section

Under study is a "duplex slug" for U-233 production, consisting of a 2.4 mil coating of oralloy fuel on a thorium metal producer core. Fission product effects, in particular fission gas evolution, may prove serious in such a slug at high fuel burnouts. For example, a 27 mil radial displacement of a 35 mil thick aluminum jacket has been calculated for 30 percent burnout in the event of complete release of fission krypton and xenon from the oralloy layer.

Elevating the uranium surface temperature of a fuel element substantially above that of the pile coolant, e.g., to 200-400 C, may reduce rupture susceptibility since higher temperatures are presumed to increase plasticity and anneal radiation damage. Such high surface temperatures can be achieved by thermally insulating the slug from the jacket. The first insulated slug to be tested will be prepared by jacketing a cored, natural uranium slug in aluminum with a layer of anodized aluminum adjacent to the uranium. Some anodized cans and caps have been prepared for test canning, and the first closures will be made early in June by Fuel Technology using the hot press pressure welding technique. These test closures will be sectioned to determine whether aluminum oxide has entered the weld area.

In a large fraction of current in-pile slug failures, a radial or longitudinal crack propagates in the uranium core. The Al-Si bond over the crack fails, but the aluminum on each side of the failure is still bonded to the uranium core. Thus as the crack propagates, the gage length of aluminum stressed by this crack is very short and failure of the jacket follows. It is hoped that this situation can be improved by omitting the aluminum-uranium bond, leaving the aluminum free to move with respect to the core. In the event of core failure the gage length of aluminum stressed will then be the entire circumference of the jacket, greatly reducing the probability of jacket failure. A production test has been drafted for irradiation of two unbonded slugs to 200 MWD/T, two to 400 MWD/T, and four to goal exposure. Slugs for this test are now being fabricated.

The four enriched cored slugs charged in the hot spot in C Pile in February under PT 105-513-SI are still operating normally, having now accumulated an exposure equivalent to about 1060 MWD/T. A supplement to the production test has been issued authorizing continuation of the irradiation until a rupture occurs in the tube.

Preparatory to dynamic stress considerations, an approximate calculation has been made of the time dependence of temperature in a slug subjected to sudden application of power. The derived formula indicates that the steady state temperature is attained in 10 to 15 seconds.

The time dependence of the stress and strain condition of a Hanford fuel element is being studied to provide a basis for analyzing the effects of creep, thermal cycling, etc. Initially, an attempt is being made to adapt an analytic method to an equation of state involving the interdependence of stress, strain, and strain rate.

Preparation of a uranium double salt is under study as a possible starting material for reduction to the metal. UNH can be reduced by Fe^{++} ion in the presence of F^- ion, in which case a hydrated UF_4 precipitates. If NH_4F is present, anhydrous $NH_4F \cdot UF_4$ precipitates and this double salt is fast-settling and can be washed, filtered, and easily handled. It would, of course, have to be decomposed before reduction to metal. It can be decomposed at 375 C in 100 minutes in vacuo, according to Bernhardt, et al.(1) It appears that precipitation must be carried out from

(1) Bernhardt, Gustinson, Posey, Thermal Decomposition of the Compound $UF_4 \cdot NH_4F$, K-410 (Secret).

Applied Research Sub-Section

a solution of less than 40 g/U/l to avoid precipitation of another compound, perhaps UO_2F_2, prior to reduction by the Fe^{++}. Several attempts have been made to find the best conditions for precipitation of $NH_4F \cdot UF_4$, with respect to acid concentration, source of Fe^{++} ion, etc. The most successful method of preparation found to date is the addition of excess crystalline ferrous sulfate to a solution of UNH containing excess NH_4F. Preliminary analytical data indicate a rather high uranium solubility, however, in the range of 3-5 g U/l. Therefore, further solubility studies should be made. A decomposition and subsequent reduction run on a batch containing about 35 g U is now in progress.

Several open pot reductions of UO_3 with aluminum in the presence of cryolite have been carried out, studying the effect of varying the UO_3:Al ratio. Rough analyses indicate products containing at least 50 percent uranium to be easily attainable. Analyses of product and determination of percent yield are delayed until remelting facilities are installed (induction generator).

Radiometallurgical Examination

A metallographic study was started on the slug from PT-532-A3 which had been irradiated at a power level calculated to heat the center of the slug above the alpha-beta transformation temperature of 660 C. Variances in the microstructure along the slug radius indicated that within 1/4" of the slug axis the metal had been heated above 660 C. Further study will be necessary to determine exact extent of beta-phase heating within the slug. Radiation damage within the metal appeared in the form of extensive twinning.

Ruptured Slugs from PT-25M

An examination of three caps from slugs which failed in a production test of uranium slugs machined from salt bath, heat-treated, Fernald rolled rods was begun. The examination of the caps was initiated because of the high incidence of "cap failures" in this production test (105-313-25M). At least 50 percent of the 23 ruptures in this test have been of the type in which the cap is forced from the slug. In the initial inspection no defects could be seen on two of the caps. On the third cap there was a gas pocket in the Al-Si braze beneath the weld, but it could not be determined whether actual penetration of the welded closure existed. Further work on the caps to determine cap and weld quality is in progress.

Radiometallurgy Facilities and Equipment

The contamination in cell D was reduced to a level permitting installation of the hardness tester and removal of the sample canner. The remotely operable Rockwell hardness tester was calibrated and installed. The existing manipulator in cell D was removed for maintenance and reinstalled. A second manipulator for use with the hardness tester was installed.

In the metallographic cell polishing and optical equipment was successfully used in the examination of irradiated uranium microstructure. Difficulty was experienced in obtaining satisfactory photomicrographs of irradiated uranium at lower magnifications (150X) with polarized light. Results at higher magnifications (300X) were excellent. Installation of the liquid waste disposal system which will connect to the crib waste was started.

Applied Research Sub-Section

Complete decontamination of cell B was accomplished, and alterations to permit greater utilization of the cell were nearly completed. A 4" lead partition dividing the cell into two equal compartments was installed. In one compartment installation of equipment designed to handle ruptures and provide contamination control in ruptured slug examinations was started. The remaining half of the cell will be left free for other whole slug work. In each compartment 1" holes were drilled in the cell floor to accommodate drains to the crib waste system.

Separations Plant Corrosion Problems

Studies of the effects of metal skin temperature and of solution composition on the corrosion rates of metals exposed to Redox D-12 Waste Concentrator bottoms are being continued. In two of these tests specimen temperatures equivalent to that obtained in steam heating tubes and coils are achieved by sealing the D-12 solution (BP = 118 C) together with the coupons in heavy-walled glass tubes and heating these tubes in a high temperature thermostat. Two type 75-A titanium coupons have been exposed continuously at a temperature of 165 C (equivalent to 87 psig steam pressure) for 120 hours. Visual observation of the sealed specimens after this exposure was made and no corrosion effects were noted. The effects of different titanium surface pretreatments are also being studied in these tests; prior to exposure in the test solution one of the titanium coupons was treated in a 20% nitric acid solution, while the other was treated in a 20% hydrochloric acid solution containing a small piece of carbon steel.

Studies to determine the effects of reducing agents on the corrosion rate of the D-12 waste solution boiling at atmospheric pressure are continuing. In these tests 304L stainless steel and type 75-A titanium are being exposed to 70% ANN solution, normal Phase I D-12 solution, normal Phase II D-12 solution, Phase II D-12 solution in which the hexavalent chromium ion is reduced with hydrogen peroxide and also with sodium nitrite. Welded titanium coupons are also being tested.

A proposed change in the 231 Building processing operations involving the use of sodium-dichromate rather than potassium permanganate has been investigated from the corrosion aspect. Corrosion rates for type 309 SCb exposed at 80 C to nitric acid solutions containing three different concentrations of $Na_2Cr_2O_7$ were determined as follows: HNO_3 (240 g/l), $Na_2Cr_2O_7$(300 g/l) - 0.054 inches/month, HNO_3 (240 g/l), $Na_2Cr_2O_7$ (200 g/l) - 0.046 inches/month, and HNO_3 (240 g/l), $Na_2Cr_2O_7$(150 g/l) - 0.032 inches/month. A type 309SCb weld crater specimen was exposed in each solution and in all three cases the crater suffered severe attack. Considering that the solution must be heated through a steam jacketed vessel wall, these corrosion rates must be considered intolerable. In spite of the fact that the conditions tested are attained only during cleanout periods, a favorable recommendation cannot be made.

Stainless steels types 329 and 312, a new alloy International Nickel Company 803, and titanium were corrosion tested in boiling 65% nitric acid. The purpose of the tests was to screen the materials for preliminary data upon which their performances could be compared to other alloys in common use at HAPO. Type 329 (nominally 30% chromium, 5% nickel) exhibited an average corrosion rate of 0.0006 inches per month when tested in the as-received condition. Type 312 (nominally 29% chromium, 9% nickel) exhibited an average corrosion rate of 0.0004 inches per month when tested

in the as-received condition. Additional tests of sensitized specimens of these materials are under way. A new alloy recently marketed by International Nickel Company designated alloy 803 exhibited an average corrosion rate of 0.0013 inches per month when tested in the as-received condition. This alloy has a composition of 39% nickel, 21% chromium, 3% molybdenum, 1.75% copper, 0.40% silicon, 0.60% manganese, 0.05% carbon with the balance iron. A specimen of titanium tubing exhibited an average corrosion rate of 0.0005 inches per month and the rates for different periods were quite consistent. A specimen of titanium plate exhibited an average corrosion rate of 0.0017 inches per month, but in this test the corrosion rates fluctuated from 0.0003 inches per month to 0.0028 inches per month for different periods.

The first calibration run on the heat transfer equipment has been completed. The equipment comparison values indicate that the effects of corrosion product build-up and boil-up rate must be evaluated before reproducible results can be achieved. It is planned to obtain the corrosion rate versus skin temperature curves of types 304L and 309SCb stainless steels exposed to Redox D-12 waste concentrate as the first working function of the equipment following calibration.

Tests were completed and a letter issued indicating the apparent suitability of the type 304 stainless steel helical springs to be used as expander rings in Purex pulse generating equipment. An actual spring was exposed to boiling 65% nitric acid for five 48-hour periods. The average corrosion rate for the 240-hour test was 0.0009 ipm. It was concluded that these springs were suitable for the intended service for the following reasons: (1) the corrosion rates of the spring are as low as can be expected of type 304 stainless steel, (2) the corrosion rate - time function indicates a decreasing corrosion rate with respect to time, and (3) it can reasonably be assumed that boiling 65% nitric acid is more corrosive than any stream which will be in contact with the springs.

Plutonium Metallurgy

Calibration trials of the quartz plate interferometer dilatometer and of the automatic film recording device have been made prior to work with plutonium. The interference thermometer has been calibrated using the inversion of alpha-quartz to beta-quartz at 573.3 C as a base point. Considerable difficulty has been experienced with vibration of the dilatometer. In a few instances the interference fringes were in a constant state of agitation making impossible the recording of a distinct pattern. A survey was made of the instrument, the hood and its environs to determine the source and magnitude of the vibrations. The major source is coming from the barrier curtain behind the hood with very violent 60-cycle vibrations. Flow of cooling water also contributes to the vibrations. These sources will be minimized as much as possible.

A counting rate computer has been installed and checked for use in connection with crystallite size determination, estimation of degree of cold working in metal, and lattice parameter measurements. The possibility of forming a double salt, calcium plutonium fluoride ($CaPuF_6$) is being further investigated by heating of the components in a sealed tube. When such material has been prepared, it will be examined by x-ray diffraction.

Applied Research Sub-Section

Material Testing - Plutonium Reduction Bombs

Sigma phase has been tentatively identified in the 309SCb stainless steel that has been thermally cycled in the stress-rupture tests. It had been previously believed from a study of the literature that little if any sigma should occur in this material. It is now believed that thermal cycling through the favorable formation temperature causes a greater amount to be precipitated than is formed in constant temperature creep tests. Since relatively large amounts of sigma are formed, an investigation is being made to determine more about its effect on 309SCb during the reduction cycle. The data being obtained are the room temperature and high temperature tensile strength of 309SCb stainless with sigma phase present in the material; the low and high temperature impact strength; rate of growth versus the number of cycles; and the creep strength of a previously unexposed specimen.

Plutonium Chemistry

A literature search has been made for compounds which will appreciably lower the melting point of calcium oxide slags. A number of fluxing agents appear to be worthy of consideration. Three reductions on a 20-gram scale have been made using calcium fluoride, calcium chloride, and magnesium fluoride fluxes. All were carried out in a hermetically sealed bomb heated at 950 to 1000 C in a resistance furnace. Although the charges apparently fired, no metal buttons were produced. Upon examination at 250X magnification some small metallic spheres were apparent. A low voltage power supply has been assembled for use with a high temperature resistance furnace. Two 220V-20A powerstats are being ganged for use with a 12 kw transformer. This equipment is expected to be completely assembled by the tenth of June.

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 May 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
J. T. Russell	The Regulation of High Voltage, Low Current Power Supplies
J. T. Russell	The Field of Neutron Flux Monitoring
M. B. Leboeuf & F. P. Brauer	An Instrument System for Estimation of Maximum Plutonium Content
A. S. Wilson	The Use of Sulphur Dioxide to Improve the Solvent Extraction Behavior of Ruthenium

No report will be issued concerning the invention reported in the March Monthly Report, "The Use of Long-Lived Gamma Emitters as Localization Markers for Aircraft and Ships," by M. B. Leboeuf.

Signed: J. W. Albaugh
Manager, Applied Research
ENGINEERING DEPARTMENT

GENERAL ELECTRIC COMPANY

[redacted]

HW-31964 [redacted]

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

June 4, 1954

This document consists of _____ pages. No. ____ of _____ copies. Series ___.

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

MAY, 1954

121 [illegible] 2

[redacted]

VISITORS AND BUSINESS TRIPS

Name	Date	Address	Purpose
J. R. Keeler J. G. Beach	5/4,7/54 5/6,7/54	Battelle Memorial Inst., Columbus, O.	Metallurgy of uranium
D. W. Smith P. P. Zeigler	5/5,6/54	Kaiser Aluminum & Chem. Corp., Spokane, Wash.	Coatings & corrosion discussions
D. W. White A. P. Beard	5/6,7/54	KAPL, Schenectady,N.Y.	Fuel element discussions
H. A. Wilhelm	5/10,14/54	Ames Laboratory, Ames, Iowa	Fuel element discussions
J. C. Finley	5/12/54	ALCOA, Seattle, Wash.	Discuss aluminum fabrication
C. Steffens	5/17,21/54	Stanford Research Inst., Palo Alto, Calif.	Fuel element development

Name	Date	Place Visited	Purpose
E. C. Pitzer	5/2,12/54	ANL, Chicago, Ill.	Attend Electrochemical Society
		Commonwealth Engr. Co. of Ohio, Dayton, Ohio	Consultation on carbonyl process
A. T. Taylor	5/11,15/54	ALCOA, Edgewater, N. J. & New Kensington, Pa.	Fabrication of aluminum components
D. C. Worlton	5/15,22/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Trial of testing equipment
R. L. Reynolds	5/17,20/54	GEL, Schenectady,N.Y.	Consultation on underwater examination equipment

GENERAL ELECTRIC COMPANY

Fuel Technology Sub-Section [redacted]

ORGANIZATION & PERSONNEL

Personnel totals as of May 31 were as follows:

	Exempt	Technical Graduates Permanent	Technical Graduates Rotational	Non-Exempt	Total
Fuel Assembly Unit	22	--	--	13	35
Fuel Element Development Unit	14	1	--	7	22
Fuel Evaluation	15	--	--	14	29
Coatings & Corrosion	11	1	1	6	19
Testing Methods	8	--	1	2	11
Technical Shops	4	--	--	25	29
Administration	1	--	--	4	5
Totals	75	2	2	71	150

URANIUM QUALITY

Slug Core Characteristics

To obtain information regarding several variables in the thermal fatigue (woodsplitter) test, experiments were run using four-inch thermocouple slugs, a simulated slug column to modify cooling at the ends of slugs, and nickel-plated slugs. The reproducibility of the radial temperature data, as determined by four-inch thermocouple slugs, was good, and the data are presented graphically in the body of this report. A slug section was placed at each end of a powder metal compact to reduce the cooling effect of the water at the end of the slugs; this test modification neither changed the tendency of the powder metal compacts to split transversely nor increased the number of cycles required for failure but, in high alpha phase cycling, it moved the transverse failures from 3/4 of an inch to 1-1/4 inches from the slug ends. Tests on the nickel-plated slugs indicate that the nickel-plate does not affect the test results and confirm that the failure of the slugs is due to fatigue action rather than corrosion.

Further investigations regarding the sources and distributions of hydrogen in uranium slugs were conducted, reflecting concern that the reduction in mechanical properties resulting from the presence of hydrogen may contribute to the splitting of cores during irradiation. These investigations indicate a direct relationship between the rate of hydrogen pickup of slugs during storage and the humidity of the atmosphere and no apparent relationship between the amount of hydrogen picked up by outgassed uranium and the amount of hydrogen present prior to outgassing. To determine the effect of hydrogen on slug rupture rates, a production test is proposed to irradiate matched tubes of eight-inch slugs both outgassed and un-outgassed prior to lead dip canning. This test is designed to obtain information on the splitting of slugs in the pile with respect to observed deformation patterns in rolling and the relationship between warp of the rod after beta heat treatment and warp developed in the pile during

irradiation. It is further proposed to attempt in this test to establish the degree to which the woodsplitter is able to predict the tendency of slug cores to fail in pile operation.

Evidences have appeared recently indicating that the tendency of slugs to warp may be induced by asymmetries in flux distribution in the pile and by irregularities in the radial distribution of heat in the slugs during irradiation. An investigation is proposed to determine whether the remarkable differences in plutonium and fission product distribution, are also present and related to the warp in slugs which have been irradiated to about 720 MWD/T. Inspection of 14 warped eight-inch slugs revealed that the plane of warp was perpendicular to the plane intersecting the ribs. In view of a strong indication in two preliminary woodsplitter tests that permanent warp can be induced in slugs by radial inequalities in heating or cooling, further evidence will be sought relating these planes of warp to the tube ribs.

Heat Treatment of Uranium

Indications that irradiation to 900 MWD/T and higher may be limited by excessive warping of eight-inch slugs has led to careful studying of the warp data in production tests 6-M and 7-M. Preliminary indications are that under present 105-D pile conditions, the severity of warp may increase sharply between 1000 and 1200 MWD/T. This investigation is continuing.

Reduction and Casting

An increase in the acceptable oxygen content in green salt (UF_4) will permit increasing through-put of the Fernald and Mallinckrodt green salt plants. An investigation of eight ingots fabricated from green salt having oxygen contents differing by a factor of two indicated, in the range of oxygen present, no significant differences with respect to chemical composition, rolling characteristics, slug yields, mechanical properties, or reactivity. A larger sample may be necessary to verify this indication.

A downward trend in the reactivity of production uranium is indicated by recent test pile results on egg samples (TDS). Investigations of possible causes are being conducted at Mallinckrodt and Hanford in an effort to reverse this trend before significant amounts of pile reactivity are lost.

Rolling Processes

The next step in evaluating rolling deformation patterns and developing means of alleviating the tendency of slugs to split during thermal fatigue testing has been planned. In this investigation, the eight-inch slugs from rods fabricated several ways, will be cut in two, and one-half of each slug will be subjected to different types of beta heat treatments and stress relief anneals to determine the relative benefit of each type. An important incident to this test will be determining relationship between MIZ-2 metal soundness inspection data and chemical analyses and the number of cycles required to induce failure in the woodsplitter.

GENERAL ELECTRIC COMPANY

Fuel Technology Sub-Section

URANIUM DEVELOPMENT

Cored Slugs

The machining and welding of 300 pairs of cored and solid four-inch pieces for in-pile testing has been completed. Each cored slug was carefully bubble tested to insure that any defective welds were rejected prior to submitting the slugs to Manufacturing for lead-dip canning.

Two tests were conducted to predict the effect of water remaining in the cavity of a cored slug during canning or pile exposure. A slight bubbling of the duplex bath was noted when slugs containing water were submerged beneath the bath. Two slugs with holes in the welds were tested in the woodsplitter with minor corrosion of the internal surfaces being the only effect noted after 50 cycles at approximately the maximum power available. Apparently any water which might gain entry to the core during pile operation would react with the uranium to produce oxide or hydride and cause no deleterious pressure buildup within the cavity.

Extrusion techniques for the fabrication by alpha phase extrusion of hollow uranium rods with nominal 1/4, 3/8, and 1/2 inch inside diameters will be investigated at Adrian, Michigan during the early part of June.

Uranium Alloys

A four-inch slug cut from rod rolled and heat treated at Fernald of Hanford cast uranium-silicon alloy was tested in cyclic thermal strain in the woodsplitter. The power input was sufficient to transform a large central core into the beta phase. After 75 cycles the slug had increased in length by approximately 2 mils with no change in diameter. Sectioning showed no evidence of crack formation as was evidenced in the chromium alloy piece previously tested. Additional tests will be performed on this alloy to substantiate these rather remarkable results.

Rod containing silicon, chromium, and titanium will be extruded at Adrian early in June.

Fabrication of Uranium

Six tubes at F pile were charged with eight-inch lead-dip canned alpha extruded slugs during May. This material will provide information as to the pile behavior of alpha extruded beta heat treated uranium.

The pre-irradiation evaluation of uranium powder metal compacts has been completed and the slugs are ready to be canned. A portion of these slugs will be tested at high power level in C pile to determine the rupture behavior of slugs having high yield strength but low ductility. The balance of the slugs will be irradiated in F pile.

COMPONENTS

Uniskanning

The feasibility of the uniskanning process for fabrication of slug sweaters and cans was investigated. Several zircalloy 2 sweaters of 0.003" to 0.004" in wall thickness and 9 inches in length were produced. The production of regular aluminum cans from thick wall blanks appears feasible, with modifications to the equipment. Designs for these were initiated.

Drawing

Experimental programs in drawing, re-drawing and other modifications of these methods, concerned with zircalloy 2 and aluminum, were pursued. Designs for new dies were initiated and submitted to Technical Shops for fabrication.

Casting

Direct casting of slugs into zirconium cans was continued. Modifications to the casting equipment were designed which, it is believed, will eliminate present difficulties associated with mis-runs and cold shuts.

Grain Growth

Excessive grain growth in aluminum cans which is considered to be detrimental for pile service, was investigated. It appears that small amount of cold working combined with slow heating, which may be encountered during the manufacture of the fuel element, contribute to this problem. A development program to determine the critical strain and heating rate was formulated.

Can Quality

Aluminum can quality was investigated from several points of view; i.e., discussions were held with can manufacturer, inspections of ruptured slugs were made and experiments with high purity aluminum cans were continued. Modifications to base alloy compositions and dimensions of the cans for various canning methods were in progress.

CANNING PROCESS

Lead Dip Canning

The occurrence of Al-Si "spikes" through the weld beads of lead dip canned slugs diminished to a marked degree following replacement of lead-contaminated bath metal. No definite conclusions have been drawn on the mechanisms of "spike" formation. The bath composition, particularly with regard to the amount of lead present, and the variations in welding practice still seem to be the most significant factors.

hree caps from Production Test 313-105-25-M "cap" failures have been visually examined to date in the Radiometallurgy facility. Canning defects serious enough to allow entrance of water through the cap were not found. Conditions for mechanically pushing the cap off the body of the slug (by uranium distortion for example) are being studied on unirradiated pieces.

Hot-Pressed "J" Slugs

Formal process specifications are being prepared for the production of hot-press canned "J" alloy cores. A program is being conducted concurrently to better adapt the process techniques to production canning. The Metal Preparation Section is scheduled to provide about 9000 hot-pressed J slugs by the end of August for fuel in the J - Q (thorium) load.

Fillerwelding

The Fillerwelding technique was placed in part time use for welding both lead dip (uranium) and "C" process (fuel and target) production late this month.

CANNING DEVELOPMENT

Mechanical Hot-Press Canning

Thirty-six 4-inch nickel plated slugs were hot-press canned to complete commitments for two MTR tests. The blistered rejects amounted to about 15 per cent. From the remaining slugs, two were selected for the HAPO-MTR test and ten for the Sylvania-MTR test.

Fifty 8-inch slugs were hot-press canned in solid dies for evaluation of the slug and equipment. By quenching the assembly, the differential expansion of the steel and uranium freed the slug. The production rate is about one-third that for split dies due to the slower heating time. Evaluation of this method is continuing.

Several internal and external cooled (hollow) nickel plated uranium slugs were hot-press canned. No difficulty was experienced in canning this type of configuration. The slugs are being examined for bonding.

DEVELOPMENT EQUIPMENT

Gang Press Prototype for Hot-Press Canning

Eighty-eight 8-inch nickel plated uranium pieces were hot-press canned during the month on the four-unit pilot model gang press. Approximately 45 per cent of the canned pieces had from one to ten blisters on the surface of the can. Blistering is attributed to either inferior uranium quality, surface defects developed during the plating operation, or air trapped in the can during the cold sizing operation. Various procedures such as outgassing before sizing, oxygen flushing, and improved cold sizing techniques are being investigated as possible remedies for the blister formation. Eight solid dies are being fabricated for the pilot press to investigate

the integrity of uranium slugs canned in solid dies and water quenched before removal of the piece from the die. Facilities for decreasing the amount of air in the sized piece by applying a reduced pressure to the interior of the solid die during preliminary heating are being fabricated. A solid die of Chro-Mow tool steel was heated to 600 C and quenched in water for 100 cycles to investigate the effect of sustained quenching on the dimensional stability of the die. After 100 cycles, no significant dimensional changes were noted.

Pilot Plant

The Phase I construction, building shell, of the Fuel Element Pilot Plant - Project CA-546 was completed during the month. The contract for Phase II interior construction is expected to be awarded to L. H. Hoffman on June 1, on the basis of a low bid of $460,000. Consideration is now being given in detail to the layout of the development and semi-works lines to be installed in the Pilot Plant.

FUEL EXAMINATION

Hanford representatives inspected and accepted the 100-C facility slug weigher at the General Engineering Laboratory. The equipment will be shipped in June.

Fabrication of the stereoscopic slug viewer was completed by the optical shop.

On May 25, the underwater door seal separating the 100-C Metal Examination Facility from the storage basin failed filling the facility with basin water and interrupting preparation for painting (sealing) the concrete. Replacement of the seal is necessary.

TESTING METHODS

Eddy Current Instruments

In spite of the limitations as regular production tools of the two eddy current instruments which have been under development, the MIZ-1 Al-Si penetration detector and the MIZ-2 crack and inclusion detector, these instruments were prepared for possible production use this month. In the case of MIZ-2, it is felt that the ability of this device to select out-cracked slugs and slugs with inclusions, whether or not these defects appear on the surface, would make its use profitable in reducing the incidence of split ruptures even if it could be used on only a portion of the material throughput. Use of MIZ-1 on a large portion of the throughput is conceived as a preventive measure against a higher incidence of side wall failures after a summer of high inlet water temperatures and consequent increased corrosion rates.

Work in progress on both instruments was accelerated. Electronic circuits were checked through and cleaned up in both. On MIZ-1, new probe designs in progress were hurried through in an effort to improve the previous performance where a large number of the rejects were spurious, apparently resulting from excessive vibration in the probe uspension as the probe scans the slug at a rate of more than 60 lineal inches per

second. The new designs appear to be very successful. Recent investigation on a group of 604 slugs rejected for other reasons than marred surfaces produced results which may be summarized as follows:

Number of slugs rejected by MIZ-1	26
Number of slugs with penetrations within 20 to 21 mils at locations where signals were noted	18
Marred surfaces	3
Wrinkled can	1
No explanation found for signal	4
Total	54 or 9%

What portion, if any, of the accepted slugs had penetrations is not known. The incidence of 20 mil penetrations is normally about 2.5 - 3% and, consequently, a large sample would have to be tested to determine this.

The MIZ-2 was used to test 800 pices in a search for new standards. The change from a grooved to a smooth slug surface has made the old standards obsolete.

Unbond Test

An electronic counter is being used to count the total number of defect indications received by the ultrasonic unbond test in testing a slug. It is hoped that this procedure will make the adaptation of this test to production use easy. With a constant repetition rate of the sampling pulse and a constant angular and linear velocity of the slug on its conveyor, the total number of sampling pulses should not vary greatly. If necessary, these can be counted too. Assuming a constant number of sampling pulses, the number of defect indications received is probably proportional to the fraction of the total area which is unbonded.

Arrangements are being made with the Metal Preparation Section to test a large number of frost test rejects to check this hypothesis and to define the process application problems which must be solved before this equipment can be used in place of the frost test.

Ingot Test

A field trial of the ultrasonic ingot test was held at Mallinckrodt Chemical Works this month. The breadboard device had ample power to penetrate 7" diameter ingots; however, detection of small defects (about 1/16") was not possible because of deviation of sound travel from straight paths through the ingot, apparently the result of channeling in the large dendrites. The results of the test are encouraging and indicate that with improvements in application it may be a suitable production inspection.

COATINGS & CORROSION

Corrosion-Resistant Films

Regular production canned slugs having sealed anodized films were exposed to 120 C pile water for 14 days with no apparent destruction of the protective films. Similar samples have lasted over 50 days in 90 C pile water. This is much greater corrosion

resistance than heretofore obtained with various types of anodized films. A production test of these anodized surface slugs is being arranged. Conceivably this anodizing can have a significant effect on reducing the slug failures due to corrosion of the can.

A very corrosion-resistant film was formed on steel samples by autoclaving in a chromic acid solution at 170 C. This film is being studied to determine its value for general applications.

Examination of Aluminum Cans

Some aluminum cans having very large grains are being studied to determine the type and degree of corrosion expected in the pile. This study was started after it was observed that canning by hot pressing, differential thermal expansion, or vacuum Al-Si dipping formed these large grains.

Corrosion Rate Studies

The fundamental corrosion equation has been applied to the data from the Flow Cup Laboratory. It has been shown that this equation may be simplified for the low temperature laboratory data where film losses are low. The more complex form is probably more applicable for pile conditions.

Electroplating Studies

Tensile tests have shown that the current density used for anodizing may be varied over a considerable range without seriously affecting the quality of the finished piece.

Satisfactory electroplates of iron, copper, and bronze have been applied to uranium. A dual plate of iron and copper appears especially attractive.

Hollow slugs have been electroplated successfully. The procedure includes recirculation of the plating solution through the center of the slug. An alternative procedure for applying the barrier layer was developed. This procedure includes plating the outside surface of the uranium slug and that portion of the aluminum can which is pressed against the inner surface of the hollow slug. Using a modified etching procedure, some thorium slugs were plated in the regular plating bath. The plates were satisfactory; no difficulty was experienced.

A total of almost 400 uranium and thorium slugs were plated during the month. A slight process modification resulted in more efficient control of quality.

Vacuum Studies

Outgassing studies have shown that 95 per cent of the hydrogen is removed from a 4-inch uranium slug in three hours at 635 C; at 435 C, only 43 per cent is removed in the same period.

Several cold-sized assemblies have been outgassed to determine the amount of gas that may be easily removed and the amount that re-enters the assembly on standing. The results indicate that more careful drying or outgassing at room temperature may help prevent blistering during hot pressing.

GENERAL ELECTRIC
COMPANY

Fuel Technology Sub-Section

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.

G R McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

A. W. Jacobson, Bristol Co., Waterbury, Conn., visited here May 4th through 7th to inspect questionable recorders.

R. B. Ross, Armstrong Cork Co., Seattle, Wash., visited here May 13th to inspect noise conditions.

R. G. Lorraine and A. J. Mellor, General Electric Co., Atomic Power Study Group, Schenectady, N.Y. visited here May 24th-26th to discuss reactor development.

J. W. Peckham, Bristol Co., Waterbury, Conn., visited here May 25th-26th to inspect function of faulty recorders on radiation monitoring service.

E. B. LaVelle attended the National Spring Meeting of the American Welding Society, Buffalo, N.Y. on May 3rd-7th and the Spokane Welding Exposition, Gibson Welding Suppliers, Spokane, Wash., on May 21-22nd to deliver technical papers. He also visited the Bingham Pump Co., and the Willamette Iron & Steel Co., both of Portland, Ore., on May 20th to provide technical assistance to the GE inspector on fabrication of pump casing for CA-512.

C. A. Simsen attended the Institute of Radio Engineers Technical Conference in Portland, Ore on May 5th.

O. H. Pilkey visited the State College of Washington, Pullman, Wash. on May 6-7th to present a paper to engineering students and faculty.

J. R. Carrell and J. C. Wood visited Pacific Oerlikon Co., Tacoma, Wash., on May 10-14th to witness testing and operation of the CA-512-R charging machine.

R. T. Jaske attended meeting of American Society of Heating and Ventilating Engineers, Vancouver, B. C. on May 13-14th to give an address.

H. J. Bellarts visited Crawford & Doherty Foundry, Portland, Ore., on May 19th, the Pittsburgh Lectrodryer Co., Pittsburgh, Pa., on May 24th, and the C. M. Kemp Co., Baltimore, Md., on May 25th to discuss fabrication of equipment. On May 26th to 28th he and T. J. Jeffs each delivered a paper at the Third Information Meeting, Hot Laboratories, at the Brookhaven National Laboratory, Upton, N.Y.

M. E. Forsman visited Panascan, Inc., Chicago, Ill., on May 20-25th to observe equipment test of the temperature monitoring to be used on CA-512-R.

E. L. Reed and J. W. Kolb visited the Kaiser Aluminum Co., Trentwood Rolling Mill and the General Machinery Co., Spokane, Wash. on May 20th to observe and discuss induction and heliarc welding of aluminum tubing.

W. A. Richards visited Builders Iron Foundry, H. D. Fowler Co., and Bailey Meter Co., all at Seattle, Wash., on May 26-27th to consult with manufacturers' engineers on flow and ontrol problems for Project CG-558.

RGANIZATION AND PERSONNEL

Personnel Statistics:

	April 30			May 31		
	Exempt	Non Exempt	Total	Exempt	Non Exempt	Total
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	61	12	73	61	13	74
Design Planning Unit	18	13	31	18	13	31
Design Engineering Sub-Section	86	12	98	84	11	95
Drafting Unit	8	92	100	8	91	99
Total Section Personnel	174	130	304	172	129	301
Technical Graduates (Rotational)	-	3	3	-	3	3
TOTAL	174	133	307	172	132	304

Accessions - 1
Separations - 4

GENERAL

esign Section engineering effort for May was distributed approximately as follows:

	Man Months Expended	% of Total
1952 Expansion Program	47.9*	30.3
Reactor Plant Modification for Increased Production	22.7	14.4
Other Projects and Design Orders	38.0	24.0
Research and Development	49.4	31.3
	158.0	100.0

* Equivalent man months expended include 2 months of overtime.

Design Section drafting manpower for May was distributed as follows:

	Man Months Expended	% of Total
Design Section	81.1	89.5
Project Section	3.6	4.0
Technical Section	3.2	3.5
Other	2.7	3.0
	90.6	100.0

The drafting production for the month was 362 new drawings, 12 charts and graphs, and 324 revisions. The drafting room average was 3.9 man days per drawing.

DECLASSIFIED

ESIGN DEVELOPMENT

Statistics:

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

	Man Months Expended	% of Total
RDS-D-10 Reactor Design Development	8.8	17.8
RDS-D-11 Water Plant Design Development	5.8	11.7
RDS-D-12 Separations Design Development	18.5	37.5
RDS-D-13 Mechanical Design Development	9.4	19.1
RDS-D-14 Utilities and Services Design Development	1.3	2.6
RDS-D-15 Engineering Standards and Materials Development	5.6	11.3
	49.4	100.0

RDS-D-10 and D-11 - Reactor Plant Development

Studies relating to existing plants were continued on the increase of power levels by major increases of coolant effluent temperatures and the methods of providing better protection against the hazards of loss of cooling water. The loss of water would result in the eventual melting of the fuel elements with a release and spread of lethal fission roducts. Preliminary results indicate that the most effective method of cooling the reactor is through the process tubes. If cooling water can be maintained through the process channels for two to three hours after shutdown, water could be introduced into the moderator without steam being formed.

Another study was started to determine the extent of hazard involved in the complete failure of the steam supply to process pumps when operating at full reactor power. Preliminary results indicate that the decrease in water flow rate in the first few seconds may be great enough to initiate boiling and consequent substantial rise in power level before the vertical safety rods regain control and flow can be restored.

Other studies being conducted include the study of stability of a boiling reactor, the study of the pay-off period for a dual purpose reactor as a replacement for three existing reactors and the study of the effect of water storage and effluent temperatures on possible future reactors.

RDS-D-12 - Separations Design Development

A formal report detailing the scope and recommending the adoption of waste scavengers for the TBP Plant was completed and issued for approvals. Reduction of operating costs of the TBP Plant over its expected remaining life might be approximately $132,600. This should also free for other use about 16,000,000 gallons of waste tankage space.

Study of the maximum obtainable capacities of the Redox, Purex, and Metal Conversion Plants and means for obtaining additional capacity is continuing. The Purex Plant apacity study has progressed through about 70% of the main plant equipment. The study indicates that operations can be obtained at approximately 2.5 times the nominal Purex Plant capacity with existing major equipment. However, numerous control instruments in both process and utility streams will require replacement for operation at the higher rate.

Yield tests performed on newly designed horizontal furnace door closers and furnace exhaust line check valves for the 234-5 Building indicated that the design principles are sound but that further development will be required to obtain a more satisfactory door seal and completely reliable check valve.

RDS-D-13 - Mechanical Design Development

The development of the prototype fuel element canning machine continued through the month. A review of experiences with the operation of the machine arm control systems with the Industrial Controls Department personnel in Schenectady showed that major changes in these systems were necessary to overcome the problem of periodic malfunction which has prevented fully consistent operation during hot trials. As a result of this decision, effort was concentrated on designing, fabricating, installing and testing the equipment required to reduce the response rates demanded from the controls.

The development of a prototype in-line alpha monitor was continued during the month. A requisition for fabrication was issued for bids and purchase specifications were prepared for approximately 50% of the auxiliary control components. The evaporation unit was fabricated and will be tested to determine optimum operating conditions.

The study of the technical aspects of radio-frequency heating as applied to the welding of fuel elements was completed and a recommendation report summarizing the results is ready for issue. The report also includes an economic evaluation of this process as compared with other possible improvements in the present manual operation.

DS-D-14 - Utilities and Services Design Development

A waste line corrosion testing facility is being held in abeyance pending results of arrangements to secure test installations in projects presently being constructed or designed. Considerable saving of installation cost and study time may be possible.

Work on the independent water study for the 300 Area study was completed during the month and a final report will be issued early next month.

RDS-D-15 - Engineering Standards and Materials Development

Cost to date for development of engineering standards for the current physical year is $45,339.

The following standards and revisions to standards were completed and issued:

D-6-100 Single Phase, Primary and Street Lighting Targent
D-6-102 Single Phase, Primary Targent, Street Lighting 90° Turn
D-10-1 Single Phase, Primary Targent, Single Crossarm

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

a. Three chapters of the electrical section for the Design Criteria are being prepared and were advanced 10% during the month to 70% complete.

b. Three new Civil Engineering Standards for use in railroad construction are 70% complete, an advance of 20% during the month.

c. A study to make recommendations for a system to identify metal stocks was advanced 30% during the month to 100% complete.

d. A new concrete anchor design for guying poles was completed. Test anchors are being constructed for testing early next month.

DESIGN PROJECTS

Statistics:

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

		Man Months Expended	% of Total
CA-512-R	100-K Reactor	26.3	24.3
CA-512-W	100-K Water Plant	1.5	1.4
CA-513	Purex Separations Facility	8.1	7.5
CA-514	300 Area Expansion	9.6	8.8
CG-551	Expansion of Building 234-5 Facilities	2.2	2.0
CG-558	Reactor Plant Modification	22.7	20.9
CG-562	TBP Plant Modifications	0.6	0.6
CG-573	3X Program - 300 Area	3.5	3.2
CG-574	3X Program - Irradiation	1.4	1.3
CG-575	3X Program - Extraction	0.9	0.8
CG-578	Effluent Water Monitoring Improvements, 100-B, D, F, DR & H	2.1	1.9
CG-585	Oxidizer Off-Gas Treatment, Redox	1.9	1.8
Major Projects - Other than Expansion Program		21.0	19.4
Minor Projects and Design Orders		6.6	6.1
		108.4*	100.0

* Equivalent man months expended reflects 2.2 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 was started during the month on the 1706-KE Recirculating Water System Laboratory. It is the objective to provide a design for facilities which will be useful in studies related to possible high temperature, high pressure recirculating water systems for existing and future reactors, and, by future modifications of the piping loop, high temperature operation of existing reactors with present single pass water systems. Corrections were being made to the scope drawings which will accompany the design criteria which are scheduled for formal comment early in June. Scope design is 85% complete while detail design will start immediately and is scheduled to be completed by December 1, 1954.

A-513 - Purex Separations Facility

Authorization was received to proceed with revisions to the condenser design for the Purex Tank Farm. The first phase of the design, which involves revising existing construction drawings to eliminate present surface condenser installation from the construction contract, is 90% complete. Phase two includes material procurement for the contact condenser and has just started. Preparation of new plans and specifications for the contact condenser installation is 3% complete. Design of the new installation is being performed on a high priority basis and is scheduled for completion August 10, 1954. Present overall design completion is 25%.

Design of the Purex low-pressure nitric acid fractionator was halted during the month at the request of the AEC. The equipment will be financed under a separate project, and the fractionator equipment and accessories will be handled under a design and fabricate contract. The design work to be accomplished by the General Electric Company will amount to almost 75% of the total design work and portions thereof which can be accomplished at the present time will be carried out upon authorization. The other work will of necessity await completion of design of the fractionator.

Certain revisions as enumerated in the Purex Chemical Flowsheet HW No. 3 were approved by the Design Council and submitted to the AEC for approval.

CA-514 - 300 Area Expansion

Detail design of the 300 Area Expansion Program was advanced 5% during the month to 95% complete. Design of the 313 Building structure and equipment is approximately 97% complete. It was decided to use the 3703 Building instead of the 3702 Building for housing administrative personnel of the Metal Preparation Section. Delivery dates on the frost test equipment were not compatible with the project construction schedule. Therefore, the orders were cancelled and plans were made to use present equipment plus new equipment to be fabricated on site.

CG-535 - Redox Capacity Increase, Phase II

Final design for Redox Capacity Increase, Phase II, is 96% complete, an increase of 2% during the month. Four drawings were completed and approved during the month.

CA-539 - Redox 241-SX Tank Farm

Overall design for the 241-SX Tank Farm remains at approximately 99% complete. Approval of two drawings is held up pending placement of purchase orders and receipt of vendor information.

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

Design work on the Activation of Task I, Building 234-5, is approximately 99% complete. All design work is complete with the exception of minor drawing revisions. However, a change in scope from an agitator to a sparging system may be requested.

CG-551 - Expansion of Building 234-5 Facilities

Design work on Expansion of Building 234-5 Facilities is 99.5% complete, an increase of 0.4% during the month. Remaining work consists of the preparation of acceptance test procedures.

G-558 - Reactor Plant Modification for Increased Production

Overall design on Reactor Plant Modification for Increased Production was advanced to 18.3% complete, an increase of 2.7% during the month. Detail design is approximately 12% complete, an increase of 1% during the month. Design progress reflects a re-evaluation from last month's design schedule caused by the addition of shop drawings for prefabricated piping.

Detailed design progress included the completion of a firm schedule of detailed plans and specifications. The division of work between Project CA-513-A and Project CG-558 was resolved for the 181 Buildings and equipment arrangement plans are being prepared.

Design for the 190 Buildings, the 183 Buildings, the 105 Buildings, the effluent system, and the electrical substation was continued for the 100-B, D, and DR Areas. Specifications and drawings for equipment for the above buildings are being prepared for approval.

It was decided to locate the secondary pressure monitor panels in the 105 Building Control rooms rather than in the work area. All non-water cooled thimbles will be removed to prevent their melting in the elevated reactor temperatures.

CG-573 - Hanford 3X Program - 300 Area

A stop work order was received on May 21 for all phases of this project. The overall design at that time was approximately 75% complete. Design of the 303-J Building was completed during the month. Work that remains includes bond test, sonizon, irridite, nd product slurry recovery for the 313 Building.

CG-574 - Hanford 3X Program - Irradiation

It was tentatively decided that the scope will include the 100 Area requirements for the thorium and low g/t programs. Design of the 140-piece buckets and shipping casks for "J" slugs is continuing. All other work is suspended pending receipt of basic qualitative and quantitative information.

CG-575 - Hanford 3X Program - Extraction

Work on the Hanford 3X Program, Extraction is suspended and awaiting further program decisions from the A.E.C.

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 3% during the month to 8% complete. Nine drawings were issued for formal comment. Meetings were held with the Manufacturing Department to discuss specifications of instruments and a possible scope change.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design of oxidizer off-gas treatment equipment is 75% complete, an advance of 40% during the month. Fourteen new drawings were completed and approved and three drawings were odified.

CG-587 - TBP Waste Scavenging

Preliminary authorization for the TBP Waste Scavenging was received for the initiation of detail design. This will proceed on a priority basis and will start the first part of the month.

CG-588 - Ammonia Scrubbers, Redox

Preliminary authorization for the Redox ammonia scrubbers was received for the initiation of detail design. Design was started at the end of the month on a priority basis.

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

Design on the Redox Back-Cycle was advanced 5% during the month to 67%. Work was resumed on the D-14 vessel and its associated jumpers.

D.O. 100689 - High Speed Electric Transcriber (CG-553)

The field work progress at the 105-D Building was reviewed and approved. A requisition was written for the test units to go with the electric transcriber.

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

The design of the modification to the 314 Building for fuel development is 100% complete and involved heating, plumbing, and ventilation. Five drawings were approved.

D.O. 100750 - Project Proposal - Modification 100-C Reactor Plant

The preparation of a project proposal for the modification of the 100-C Reactor Plant was completed and submitted for internal approval.

D.O. 100752 - FY 1955 and 1956 Plant and Equipment Budget

Supplementary information of requested detail was provided to the A.E.C. for the Plant and Equipment Budget for FY 1956 and Revision of 1955.

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

Design of the modification of the 189-D Process Tube Mock-Up was advanced 5% during the month to 40% complete. Continued assistance is being provided in the design of facilities and procurement of materials for high-temperature-pressure studies. The final engineering flow diagram is now in comment status.

D.O. 100755 - Hot Semiworks Purex Self-Concentrating Waste Storage Prototype

Design work on a self-concentrator tank and associated piping and accessories for the Hot Semiworks is 80% complete, an advance of 5% during the month. Fourteen drawings were approved during the month.

D.O. 100756 - Fuel Element Pilot Plant Hoods

Design was started on equipment exhaust hoods for the fuel element pilot plant and is approximately 20% complete. Eight drawings are required.

12-10-70

.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 20% complete. Twenty-five electrical maps and 51 civil maps are at various stages of completion.

D.O. 100765 - Cell Air Cleaners - Redox Production Plant

Design work on a new Redox unit is 100% complete, an advance of 25% during the month. Seven drawings were prepared.

D.O. 100778 - Physical Constants Testing Reactor - Graphite Component Design

Detail design of the graphite components for the Prototype Constants Test Reactor was advanced 20% during the month to 95% complete.

D.O. 100781 - Scope Design for Replacement of UO_3 Nitric Acid Fractionator

An alternative means was found of replacing the UO_3 Plant Acid Fractionator with a vacuum type fractionator by the use of an existing absorber. A preliminary report was issued and design work on the vacuum fractionator was suspended in favor of the alternate method of acid recovery.

D.O. 100791 - Modification to 115-B Building for C-Area Gas Supply

esign of the modifications to the 115-B building to provide adequate gas flows to the 100-C Area was continued and is 75% complete. Requisitions for engineered material are 100% complete.

D.O. 100797 - TBP Waste Scavenging and Disposal

The project proposal for the TBP Waste Scavenging was prepared and issued for comments. The typing of the final draft was started.

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

Design was started on the Redox Silica Gel Tail-End Treatment Facility and is 10% complete. The present schedule indicates 22 drawings will be required.

D.O. 100834 - Particle Problem - Animal Exposure Equipment

Design on the alterations to the 1705-F Building was advanced 45% during the month to 75% complete.

D.O. 100843 - Central Mask Washing Station

A project proposal was prepared for a central mask washing station and approvals were being obtained at the end of the month.

D.O. 100845 - 300 Area Water Study

work on the study of the independent water supply for the 300 Area was completed during the month and a final report draft was circulated for comments.

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

Design of the general improvements to the Laboratory Area Buildings was advanced 2% during the month to 92% complete.

D.O. 100848 - Diversionary Outlet from 107 Retention Basins

Design on the diversionary outlets and an emergency crib for the 100-F and 100-D Areas is 100% complete.

D.O. 100849 - Physical Constants Test Reactor Building

Design on a building for a prototype physical constants test reactor is 100% complete, an advance of 30% during the month. Sixteen drawings and set of specifications were issued for approval.

D.O. 100850 - Fire Detection and Annunciation Facilities, 234-5 Building

A project proposal for fire detection and annunciation facilities for the 234-5 Building was prepared and approvals were being obtained at the end of the month.

D.O. 100851 - Metal Loaders - Reactor Charge Elevators

Preparation of a project proposal for a metal loading facility for the charge elevators in the 100-B, D, F, DR and H Areas was continued and is approximately 90% complete.

D.O. 100854 - 713 Building Alterations (CA-561)

Design of the alterations to the 713 Building was advanced 30% during the month to 100% complete.

D.O. 100860 - Structural Check on Floor - 325 Building

Structural analysis of a part of the 325 Building floor was completed during the month.

D.O. 100861 - Replacement of Tile Fields, 200-U and Administration Areas, 200 West Area (CA-543)

Design drawings and specifications for the two tile fields for 200 West Area were completed during the month and transmitted to the Project Section for construction.

D.O. 100868 - Water Cooler for Aquaria

Specifications for the purchase of a custom-built liquid cooling unit and submerged aquaria cooling coils were completed during the month.

D.O. 100874 - Particle Problem - Animal Exposure Equipment, Phase II

A preliminary scope drawing for a project proposal was completed.

.O. 100879 - Ammonia Scrubber - Redox

A project proposal for the Redox Ammonia Scrubber was prepared and departmental approval was being obtained at the end of the month.

1215672

.O. 100885 - Instrumentation for K-Tube Washout Tests

Design work was started on instrumentation to measure and record flow during K-tube washout tests and is 90% complete.

D.O. 100886 - Design Assistance Fuel Element Development

Preliminary information related to proposed new fuel element canning facilities on which to base high spot design and construction estimates was prepared for the Technical Section. In addition, rough equipment layouts were prepared to investigate the required building areas.

D.O. 100888 - Mobile Environmental Monitoring Laboratory

A preliminary drawing is being prepared for estimating purposes for a mobile laboratory for environmental monitoring.

DESIGN SECTION WORK COMPLETED DURING MAY

D.O. 100676 - Pressure Regulating Equipment for BF_3 Control System
D.O. 100788 - Flushing Distributer for RCU Tanks (221-U)
D.O. 100808 - Jumper, H-3 to D-9, 202-S
D.O. 100819 - Centrifuge Drawings for T, B, and Redox Plants
D.O. 100820 - In-Line Filters and Filter Stick, 231 Bldg.
D.O. 100821 - Filter Box, 231 Bldg. Duct Level
D.O. 100855 - (CG-535) Sketches for Gallery Equipment
D.O. 100857 - (CG-496) Recuplex Design Revisions
D.O. 100858 - Roof Repair - 221-T Building
D.O. 100864 - Basic Welding Methods
D.O. 100900 - Drawing Revision 221 Type Sampler
D.O. 100901 - Tank Transport Box 221-T Bldg.
D.O. 100905 - Damper Assembly, 224-U Bldg.

INVENTIONS

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

Inventor	Subject
C. A. Rohrmann	Preparation of Thorium for Irradiation, and Its Processing for Recovery of Uranium.
D. A. Ludlow	Controlled Flow of Fluids or Gases by Means of Valving Mechanisms.

P. M. Beaton
Manager, Design
ENGINEERING DEPARTMENT

1216073

[redacted]

DECLASSIFIED

PROCESS ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS

Description	** Backlog Start of Mo.	Work Sked. dur. Mo.	Time Spent During Month	% of Total Effort	Backlog End of Month	Bal. FY. 1954 June	Shed. FY 55 July	Aug.	Sept.	Oct.	Nov.	Sked. Bal FY 55	* Ant.Ft. FY 55	Total FY 55
CA-512	107.1	16	11.5	18.6	111.6	13	13	14	13	13	10	35.6	-	98.6
CA-513	13.8		3.1	5.0	10.7	3	2	1	1	0	0	0	-	4.0
CG-551	3.7		1.7	2.8	2.0	1	-	-	-	-	-	-	-	-
CG-558	40.6		4.8	7.8	35.8	5	4	4	4	4	4	10.8	-	30.8
3X	18.0		2.1	3.4	14.9	1	1	1	1	-	-	-	-	3.0
RDS Program	106.5		36.4	59.0	70.1	36	37	37	38	39	42		600	600.0
Other Major Prog.) Minor Proj. & D.O's.)	32.9		2.1	3.4	30.8	3	3	3	3	3	3		36	36.0
Anticipated Future						-	2	2	3	4	4		138	138.0
TOTALS	322.6	16	61.7	100.-	275.9	62	62	62	63	63	63	46.4	774	910.4

DESIGN ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS

CA-512	95.8	26	12.9	16.3	104.9	13	13	14	14	13	12	25.9	-	91.9
CA-513	26.3		4.3	5.4	22.0	6	6	5	2	1	1	1	-	16.0
CA-514	30.1		8.6	10.8	21.5	5	3	2	1	-	-	-	-	6
CG-551	2.3		.4	.5	1.9	1	-	-	-	-	-	-	-	-
CG-558	281.2		15.7	19.7	265.5	17	18	19	20	22	24	145.5	-	248.5
CG-587		5.0	.4	.5	4.6	2	2	0	0	0	0	0	0	-
3X	25.0		3.4	4.3	21.6	2	4	3	3	2	1	-		13.0
CG-578		24.0	1.8	2.3	22.2	3	3	3	3	3	3	4.2	-	19.2
Other Major Projects**	101.1		17.1	21.6	84.0	13	11	10	10	8	7	25.0		71
Minor Proj. & D.O's.	19.4		5.7	7.1	13.7	6	55	5	6	6	6	-	60	60
RDS	26.1		9.1	11.5	17.0	9	11	12	13	15	15		210	210
Ant.Fut.(Major)						1	3	5	7	9	11		281	281
TOTALS	607.3	55	79.4	100	578.9	78	79	78	79	79	80	201.6	551	1016.6

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects FY 54 & 55	Anticipated Future FY 54 & 55	Totals
Arch. & Civil	116.2	100	216.2
Mechanical	163.7	163	326.7
Electrical	134.2	136	370.2
Instrument	118.3	104	222.3
Standards	46.5	49	95.5
TOTALS	578.9	552	1130.9

* Includes all RDS, Ant.Future, Minor Proj., D.O's and customer work for FY 1955

** Back[illegible] adjusted to account for splitting out of CG-587 [illegible]

MONTHLY NARRATIVE REPORT - MAY 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Following is a summary of personnel changes in Project Section during the month:

	April 30, 1954	May 31, 1954	Net Change
Employees on Payroll	439	437	-2
Tech. Grad. - Rotational	12	11	-1

The end-of-month status involved these changes:

	Project Section Personnel	Tech.Grad. - Rotational
Payroll Additions	4	
Payroll Removals	5	
Transfers into Section	2	
Transfers from Section	3	1
Transfers within Section	2	

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 Completion
CG-496	Recuplex	53%	40%
CA-512	100-K Area Facilities		
	KW - Water Plant	99	91
	Reactor & Bldg.	93	78
	KE - Water Plant	82	66
	Reactor & Bldg.	65	66
	General Facilities	90	81.8
CA-513	Purex Facility, Part "A"	41	40
	Part "D"	38	42
CA-514	300 Area Expansion	40	34
CG-535	Redox Capacity Increase, Phase II	58	44
CA-539	Redox 241-SX Tank Farm	98	98
CA-546	Fuel Element Pilot Plant	12	11
CG-573	Hanford 3X Program - 300 Area		70*

* Work now authorized, which is a portion of the proposed project.

C. CRAFT LABOR

The local Building Trades Council called a work stoppage by all construction craftsmen on May 5, 1954, as a protest against the presence of Cicso Construction Company, a non-union contractor. On May 7, the craftsmen returned to work when A.E.C. stopped the work being performed by Cisco. Following the filing by Cisco of a charge of unfair labor practice, a hearing was held on May 17. The NLRB filed a restraining petition in Federal Court. Direct results of this agitation were delays to 151-KW and KE substations and the Recuplex CAW Facility.

Arbitration maneuvers concerned with the demand of construction bus drivers for isolation pay have proceeded toward a hearing about the middle of June, 1954. The Hanford Construction Contractors Committee has employed a San Francisco law firm to represent its case with the Teamsters' Union.

On the Purex project, a turnover of welder-plumber personnel was exceedingly high during the latter part of May.

D. SAFETY AND SECURITY

There were 11 regular meetings and discussions of safety, security, and health topics which were attended by about 340 personnel. Four regular Monday "tool box" meetings were conducted in the field, and two mass safety-security meetings were held for service contractor personnel. Special Hazards Disclosure and Orientation was given to 79 contractor employees. One case of skin and clothing contamination was investigated on May 12, and the personal clothing of the employee was sent to the plant laundry. About 4000 man-days have been worked in radiation zones with only three cases of minor contamination.

E. HIGHLIGHTS

Minor Projects Sub-Section

Work was done on 41 project items, two informal requests, and miscellaneous work orders, representing total authorized funds of $15,741,849. The Sub-Section completed assigned work on the following: CA-489, Positive Ion Accelerator; CG-545, Soil Science Laboratory Facilities; IR-159, Improved Ventilation Facilities, 201-C; and ER A-742, Remodeling First Aid Building - 100-B Area. Three project proposals were approved by General Electric Company. Two authorizations were granted by A.E.C. The Sub-Section accepted initial assignments of work on one project and five engineering requests. The work stoppage delayed work on Recuplex Installation from May 6 through the end of the month. Construction work was started on Gable-Butte Railroad. Important projects now in progress include Recuplex Installation, 300 Area Production Facilities, Fuel Element Pilot Plant, Hot Semiworks Conversion, and Hanford 3X Program - 300 Area.

Project Auxiliaries Sub-Section

Inspection was completed on 133 orders; 174 new orders which will require inspection were received. At the end of the month there were 1212 current

orders for items which require inspection. Intensive studies were made of castings for 100-K Area process water pumps, and of replacement of sub-standard 304-L plate in partially-fabricated Purex vessels. Reproduction output was 557,160 square feet for the 20 working days of the period. Estimating completed 26 estimates, including those for 10 project proposals. Field Surveys assisted with unitization of five projects, and performed routine surveys.

Reactor Projects Sub-Section

Packing of graphite in 105-KE Reactor was accomplished within 24 shifts between May 11 and May 19, 1954. This established a plant record, as compared to 39 shifts for 105-C. All process tubes have been installed; the top cast iron shield has been placed; and good progress was made on other installations at 105-KE. Diffusion tests were completed on May 23, and other major acceptance tests were begun. The top skin plate at 105-KW was placed. Piping was being flushed, and grouting on top of the 105-KW unit was essentially completed. The unit substation was placed in service for preliminary testing. At 181-KW River Pump House, two pumps and their ball valves are in service. The 183-KW Filter Plant has provided water for preliminary flushing. At 190-KW, process water pump bowls are being replaced. Two primary and four secondary pumps have been set in place. Final electrical connections are being made in 165-KW Building. The main control panels at 165-KE have been set in place.

Separations Projects Sub-Section

The construction contractor has revised its schedules to extend the completion date from December 31, 1954, to February 1, 1955. In the 202-A Building, about 4200 cubic yards of concrete were added, and concrete block work at the east end was completed through the ninth lift. Installation of kickplates was slightly over 50% complete. Welding in the Hot Pipe Trench proceeded slowly to about 13% complete. Erection of structural steel in the Service Section was completed by the subcontractor, and installation of built-up roofing has started. Painting with Amercoat proceeded in the Sample Gallery and Laboratory Section. Electrical and instrumentation work progressed satisfactorily. Concrete tank bases for 211-A Tank Farm have been completed, and four tanks have been received. At 241-A Tank Farm, all tank bottoms were completed in place. Progress was good on the 283-E Filter Plant Addition and 284-E Power House Addition.

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

May 31, 1954

J. S. McMahon, Manager - Projects

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

CG-579 - Effluent Water Monitoring Improvements - 100-C Area

Procurement is scheduled to start about July 1, 1954.

ER A-759 - Particle Problem Animal Exposure Equipment, Phase II

With scoping 90% complete, the project proposal is being prepared. This revision to include Phase II is being processed for approval during early June, 1954.

ER A-760 - Car Pullers 184 Building Coal Yard - 100-B, D, F, and H Areas

With scoping completed, the project proposal for installation of electric-powered car pullers is being processed for approval during early June, 1954.

ER A-761 - Decontamination Facilities, First Aid Stations, 100-H and 200-W Areas

At the request of Industrial Medical Section an engineering study of the need for decontamination facilities is being made.

ER A-3108 - Replacement of 313 Building Roof

Design was about 50% complete. Work has been started on the preparation of this proposal for replacement of the roof over the old 313 Building.

ER E-488 - Tocco Induction Heating Unit, 314 Building - 300 Area

A scope drawing is being prepared indicating a typical work station with interlocks, cooling water, and power taps.

2. Final Reporting

CA-431-A & B - Production Facilities - 100-C Area

Both parts of this project were closed out as of the end of April, 1954. Work orders have been issued to cover all remaining work.

CA-489 - Positive Ion Accelerator

With both design and construction completed, preparation of the Physical Completion Notice was begun on May 24, 1954. General Electric Company has been requested by A.E.C. to prepare as-built drawings on a work order basis.

CG-545 - Soil Science Laboratory Facilities

Both design and construction work have been completed. Information for the Physical Completion Notice is being assembled.

IR-159 - Improved Ventilation Facilities - 201-C

Work on this informal request was completed May 5, 1954. Information for the Physical Completion Notice was issued on May 24, 1954.

ER A-742 - Remodeling First Aid Building - 100-B Area

This engineering request has been closed out and charged back to accounts of the Plant Auxiliary Operations Department.

3. Current Projects

CA-192 - Remodeling Building 108-F for Biology Laboratory

Completion status remained at design 100%, construction 99%. Radiation tests have indicated that the X-ray "scatter" causes excessive dosage rates through two walls when the unit is operating at maximum capacity. In order to make the Train Shed Addition a safe, operable facility, these two walls must be shielded. Several methods of shielding, including lead, concrete brick, and stone slabs, are being studied. The project is to be closed out with this exception to be completed on a work order basis.

CA-431-C - New Reactor - 100-C Plant

Design had been completed previously; construction progressed 3% to a total of 23%. A work order was issued for fabrication of the slug cleaner, and work on this item is expected to start during June, 1954. A procurement order has been placed for fabrication of the slug breaker.

CG-496 - Recuplex Installation - 234-5 Building

Design had been completed previously; construction progressed 1% to a total of 40%. (Completion percentages were lowered to conform to weighted break-down on latest Construction Progress Schedule.) The work stoppage prevented any progress on the CAW Facility or Silica Storage Tank after May 6, 1954. The delivery of vessels has improved, since there are about 50% on the site and the remainder expected during early June, 1954. The vessels are being installed as received, and installation of process piping has started. Delivery of the process valves is scheduled to begin early in June, 1954.

CA-512 - 100-K Reactor Facilities

100-KW and 100-KE Water Plants

Over-all design of water plants remained at 99.8% complete. Construction progress was as follows: KW progressed 3.5% to a total of 91.2%; KE progressed 6.7% to a total of 66.2%; general facilities progressed 6.1% to a total of 81.8%. Cumulative totals of concrete placed to date were: KW water area 79,702 cubic yards; KE water area 75,889 cubic yards; general facilities 13,796 cubic yards.

At 181-KW River Pump House, two pumps and their ball valves are in operating condition. The permanent electrical connections for three other pumps and ball valves are being completed in the control room of 165-KW Building. The bearings of the 6th pump are being replaced.

Final electrical connections are being made in the 165-KW Building, and switchgear is being checked. Preliminary acceptance tests of equipment in the boiler room are being made, and boiler instrumentation is being installed. Piping in the valve pit is ready for preliminary flushing. The main control panels in 165-KE Building have been set in place.

Work was continued on instrument and electrical installations in the 183.1 KW Head House. Otherwise the 183-KW Filter Plant was complete and has supplied water for preliminary flushing through 105-KW Reactor.

The replacement of defective pump bowls was continued in the 190-KW Process Pump House. Two primary process pumps with new bowls have been placed, and four secondary process pumps have been set in place. Primary pumps Nos. 3 and 4 were used for preliminary flushing operations.

Work on the 151-KW and KE substations was practically stopped because of labor agitation. The 107-KW retention basins were completed except for painting. Control valves and control wiring are being installed. Interior construction of the 1700 Buildings continued at a good rate. The concrete floor slab at Building 1706-K is being placed at elevation 13'.

Construction work at the 100-KE Water Plant is following closely behind the progress of similar 100-KW buildings; however, little progress was made by pipefitters and millwrights.

105-KW and 105-KE Reactor Facilities

With the exception of as-builts, design was completed. Construction progress was as follows: KW progressed 6.4% to a total of 78.4%; KE progressed 8.4% to a total of 66.4%.

Work was continued on control systems, monitoring systems, and final grouting for equipment on top of the 105-KW Reactor. The cutting and bundling of temperature monitor lead wires for 105-KW was about 90% complete. The joints of the 105-KW downcomer have not withstood the required pressures; so the problem is being studied further by Design Section. A 10" cap layer of high density concrete was placed on the process unit. Welding of the top shield skin plate was completed, and all welds were air tested. The water test on top of the unit was completed successfully. Crossheaders and inlet face piping are being flushed.

Packing of graphite for the 105-KE Reactor was accomplished within 24 shifts between May 11 and May 19, 1954. The top cast iron has been placed,and process tubes have been installed. Diffusion tests were completed with highly satisfactory results on May 23, 1954. Acceptance tests are being conducted on vertical rods, Ball 3X system, gas leakage, process water piping, and horizontal rod assemblies. The top thermal shield cooling tubes were completed on May 25, 1954.

Electrical connections are being made for equipment and major installations, Ball 3X relay panels, and lighting fixtures. Wiring between terminal boards and installed equipment progressed satisfactorily. Pressure Monitor Panels are being placed in position.

The graphite inventory has been completed and is being moved to permanent storage in preparation for formal transfer to Stores Section. An inventory of tools, equipment, and materials is being conducted. Some equipment is being "mothballed" in place, and other portions of equipment are being dismantled for storage.

CA-513-A - Purex Facility

Design progressed about 1% to a total of 99.6%. Construction progessed 4% to a total of 40%, which is approximately on the revised schedule. Procurement action was essentially completed for construction and for miscellaneous operating and maintenance equipment. Of the 576 requisitions required from the architect-engineer, 575 have been received and 565 have been approved. All 65 acceptance tests procedures have been completed and approved.

The contractor has revised its construction schedules to extend the completion date from December 31, 1954, to February 1, 1955.

Miscellaneous concrete placements amounted to about 4200 cubic yards, bringing the total to almost 80,000 cubic yards placed. Concrete block work in the east end of 202-A Building was completed through the 9th lift. Of the required 179 cell cover blocks, 138 have been completed.

Structural steel erection in the service area was completed. Installation of kickplates was about 50% complete. In the Hot Pipe Trench 290 welds have been accepted, representing 13% of the total required.

It has been decided to replace the inferior stainless steel plate which was partially fabricated into Purex vessels. The first four units are being placed in the less critical services. No other plate from this heat is being used for Purex installations. A design change has been initiated to require X-ray of all welded pipe being used in the critical canyon vessels. This change was necessitated by discovery of inferior welds in the pipe.

At 241-A Tank Farm all tank bottoms were completed in place. Welding and X-ray were completed on Tank No. 106, and welding is in progress on Tanks 101, 102, 103 and 105. Design of the 241-A Tank Farm has been revised to require the use of contact-type condensers instead of surface-type condensers. At the 211-A Tank Farm placing of concrete for the tank bases was completed. The first shipment, which includes four tanks, has been received. The subcontractor was scheduled to begin erection during early June, 1954.

The 283-E Filter Plant Addition was 48% complete as compared to 88% scheduled completion. Erection of structural steel was completed, and about 50% of the building block masonry has been installed. All flocculator equipment has been installed.

Structural steel for the 284-E Power House Addition was about 85% complete. Boiler tubes for the No. 3 and No. 4 boilers are in place and about 80% rolled in. About 75% of the concrete operating floor has been placed. The roof slabs were about 50% complete.

CA-513-D (ER A-747) - Hot Semiworks Conversion

Design had been completed previously; construction progressed 12% to a total of 50%. Piping in "A" cell was about 60% complete, and over-all piping for the project was about 40% complete. Tanks 64, 67, and 73 have been installed. Fabrication of equipment was about 75% complete, and installation was about 40% complete.

CA-514 - 300 Area Expansion Program - Production Facilities

Design completion was revised upward to 95% complete; construction progressed 3% to an over-all total of 34%.

The structural subcontract for 313 Building Addition was completed, and the work was accepted on May 21, 1954. Other subcontractors are installing ductwork, heating controls, and piping.

In the interior of the building, the furnace pit piping has been completed. The heating and ventilating units have been set in place and are being connected. Other service and electrical installations are being completed. The caustic tanks have been insulated. In 303-K Building, the floor has been removed and the trench pits excavated.

Modification of the existing 313 Building was continued. Switchgear is being set, and the transformer pad was ready for the transformer. Other installations included bins, steam and air lines, and electrical services.

The six Ajax induction furnaces were shipped on May 25, 1954, from Trenton, New Jersey.

CG-535 - Redox Capacity Increase, Phase II

Design progressed 3% to a total of 95%; construction progressed 17% to a total of 45%, as compared to scheduled completion of 58%. Late delivery of process equipment caused the failure to maintain the construction schedule. The revised Construction Status Chart, One-Time Report of design and construction progress schedules was approved during the month.

The shell of the 233-S Building was completed, except for one small portion of the roof slab. Underfloor piping and conduits were being installed. Preparations were made for partial restriction of construction during June because of removal of the silo trench covers for the Redox shut-down.

Procurement was about 90% complete. Requisitions have been issued for two separate spare pots, one spare tower, two spare operating condensers, and six spare reboiler tube bundles. Emergency requisitions were issued for tower and reboiler gauge rings and gaskets needed for Stage I.

CA-539 - Additional Waste Storage for Redox

Design had been completed previously; construction progressed 6.2% to a total of 98.5%.

The final tank TK-115 was completed and accepted on May 25, 1954. Roads, fences, and flood lights are being completed; and temporary construction buildings are being removed. Work on the Instrument House Addition to the Condenser Building consisted of placing footings and framing.

The repair of an inoperable jet in Catch Tank 302 delayed the ready for use date by one week.

CA-546 - Fuel Element Pilot Plant

Design completion status remained at 90%; the over-all construction completion was revised downward to 11%. The Phase I work was completed during the latter part of May, with minor exceptions which will be completed during final construction.

Bids were opened during May, and the apparent low bidder was determined.

The criteria for the development equipment are being established.

CG-550 - Reactivation of Facilities

Design had been completed previously; construction progressed 5% to a total of 99.5%. Shop fabrication and assembly of five supply casks have been completed. Run-in tests are being made with the five casks so that they may be aligned for proper indexing.

CG-573 - Hanford 3X Program - 300 Area

Design progressed 13% to a total of 79%; construction progressed 12% to a total of 70%.

As of May 25, 1954, all design has been suspended pending reconsideration of information from A.E.C. regarding scope of work to be performed under this project. The revised project proposal is being routed for approvals.

Although design for 303-J Building was essentially completed, no new work has been started because of the desire to complete as much as possible of the 313 Building installation. Additional funds have been requested in the revised project proposal.

Construction progress during the month consisted of installing the 12 presses, the hydraulic piping, instrument panels, and tanks. Assembling of the furnaces has started. Structural steel for the hot water tank monorails and exhaust units has been started.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 1% to a total of 51%; construction remained at 11% complete. The diversion of available manpower to other projects has delayed design progress, and this suspension is expected to continue through July, 1954.

Construction activity was limited to the issuance of a work order for sample riser caps and flush assemblies.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design and construction work to be performed by the lump sum contractor had been completed previously. Construction work to be performed by Minor Construction progressed 12% to a total of 85%. Work was continued on percolation tests, subsurface strata sampling and other investigations necessary to design of additional cribbing facilities. Operating equipment was used to provide emergency cribbing facilities, thus delaying the backfilling of the "S" facility swamp. The fixing of contamination and the 207-S Retention Basin has been accomplished. The H.M. chamber has been relocated inside the 202-S Building. Work was started on enlargement of the present chemical waste pit.

CA-434 - New Bio-Assay Laboratory

Design had been completed previously; Phase I construction remained at 99% complete; Phase II construction progressed 3% to a total of 98%. Final inspections of Phase I and II have been held, but many small items remain to be completed. Beneficial occupancy is expected about June 14, 1954.

CA-441 - Solvent Building

With design completed, the bid assembly is being prepared by the A.E.C.

CG-511 - Completion of Minor Construction Fabricating Shops

Design had been completed previously; construction progressed 11% to a total of 98%. The decontamination facility was complete except for water and power services to the decontamination hut. Work on the improved sanitary facilities was continued according to the availability of manpower.

CA-516 - Gable-Butte Railroad

Design had been completed previously; lump sum construction was started during the last week of May, 1954, and progressed to 1% complete.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Design work by G.E. had been completed previously; preliminary prints from the contractor were received on May 20, 1954, for review. Comments were returned through the A.E.C. Construction was about 2% complete. Piping modifications within 184-D Building were essentially complete. Further work was delayed by other higher priority work.

CA-533 - Hanford Works Official Telephone Exchange

Design progressed 15% to completion. The bid opening was scheduled for June 17, 1954.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

Design progressed 80% to a total of 90%, and is expected to be completed as scheduled by June 15, 1954. Design comment drawings and specifications are being reviewed.

CA-544 - Central Distribution Headquarters

Preliminary design was 15% complete. Final approvals by G.E. have been withheld pending further study of justification.

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

Design had been completed previously; construction remained at 6% complete. Tests conducted by Separations Technology Unit have revealed that satisfactory reactor solution agitation can be obtained by air-sparging. Details relating to air volumes and pressures and their effects upon the air exhaust system are being studied. Revision No. 2 of the project proposal is awaiting final approval by G.E. Procurement of critical materials and equipment has proceeded.

CG-551 - Expansion of 234-5 Building Facilities

Design progressed 1% to completion; construction progressed 10% to a total of 22%. Installation of the hood assembly and the conveyors was 15% complete. All hood frames and hood supports are fabricated. Installation of piping and valves in the valve cabinets has started. The Maintenance portion of Part "B" was 80% complete, and Minor Construction has made preparations to begin its portion of this final inspection facility.

CA-555 - Graphite Hot Shop and Storage Building

With scoping completed and approved, a revised project proposal is being prepared for submittal to the A.E.C. in early June, 1954.

CG-556 - X-Level Controlling and Recording Equipment

Design had been completed previously; construction progressed 5% to a total of 23%. Revision No. 1 to the project proposal, requesting an extension of the physical completion date to November 1, 1954, is being routed for approval. The piping system is now being fabricated in the shop.

CG-558 - Reactor Plant Modification for Increased Production

Construction procedures are being considered for the rod replacement work and all other work to be performed during shutdowns. The performance of all proposed work during scheduled outages may be prevented by the lack of procurement authorization for piping at the 181-D Building and electric cable at the 190-DR Building.

CG-559 - Heat Transfer Laboratory

Design had been completed previously; construction progressed 30% to a total of 95%. Piping installation was nearly complete. Acceptance testing and insulation are the major items of work remaining. Because of delayed material

deliveries, the project proposal revision requesting an extension of time to July 15, 1954, is being routed for signatures.

CG-562 - Waste Metal Recovery Plant Modifications

Completion status remained at design 100%, construction 76%. Construction work has been suspended pending a decision on process requirements. A request for extension of time to April 1, 1955, has been forwarded to the A.E.C.

CG-563 - Modification to 314 Building and Installation of Electroplating Pilot Plant

Design progressed 20% to completion; construction progressed 2% to a total of 22%. Work was started on the process sewer during the last week of May, 1954. A revised project proposal requesting an extension of time to October 1, 1954, has been prepared.

CG-564 - Installation of Additional Ball 3X Equipment, 105-C Building

Design had been completed previously; construction progressed 3% to a total of 96%. The ball plating vendor is having difficulty perfecting a device to simulate the soft drop test which has been specified to test the adhesion qualities of the plate. However, it is expected that the balls will be on site before completion date. During the week of May 17, 1954, balls were shipped to Detroit for testing the ball washer in the vendor's plant.

CA-566 - Building for Prototype Physical Constants Test Reactor

[redacted]

CG-574 - Irradiation

Scoping and preliminary design are being prepared by Design Section.

CG-575 - Extraction

Design effort on this project has been suspended until the scope of work is determined.

CG-576 - General Improvements to Laboratory Area - 300 Area

Design progressed 20% to a total of 60%; construction progressed 8% to a total of 35%. The mechancial and electrical phases of the work are near completion in Section 14A-22A, with the exception of installation of the sump pump which has not been received. Mechanical and architectural phases of the work have been started in Room 12A of the 326 Building.

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

Scoping and design are being managed by the Design Section. Procurement was scheduled to begin during July, 1954.

CG-581 - Development Facility

No work was done because of the necessity of clarifying the entire Development Program.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design progressed 70% to completion; construction progressed to 23% complete. Cold side piping and instrumentation are 75% complete. Fabrication by Minor Construction was about 90% complete. Plant Forces have not started Stage I fabrication work because of higher priority work.

IR-162 - Fire Protection Buildings, 272-E and W

Design had been completed previously; construction began during the latter part of May and was 1% complete.

IR-172 - Laboratory Supply Space, 3706 Building

The project proposal has been redrafted as a result of a change in scope. The new proposal is now being circulated for approvals within General Electric Company.

* * * * * * * * * * *

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

With scoping completed, the informal request is about 75% complete. The Technical Services Unit has been requested to provide information on the

number of additional employees required. Upon incorporation of this information, the informal request will be circulated for approvals.

ER A-756 - Fly Ash Collection Equipment, Building 384

The project proposal is being circulated for approvals within General Electric Company.

ER A-757 - Temperature Control Improvement - 108-F Building

The informal request is being circulated for General Electric approvals before being forwarded to A.E.C.

ER A-758 - Mechanical Maintenance Shop Centralization - 100 Areas

With scoping completed, the project proposal was prepared and issued for comment.

ER A-1211 - Reactivate Project Proposal for New VSR Test Tower

The project proposal is being routed for signatures.

ER A-1212 - Diversion Outlet from Retention Basins, D and F Areas

With design completed, the Plant Engineering Section has reduced the scope. The informal request is being prepared.

ER A-1213 - Metal Loading Facility, 105 Buildings

A schedule has been prepared, for submittal with the project proposal, establishing a physical completion date of 12 months after authorization.

ER A-2748 - 221-T Building Roof Repair

Both scoping and preparation of project proposal are completed. The project proposal, based upon total cost of $23,000, is being routed for General Electric approvals.

ER A-2749 - Sheltered Welding Manifolds - 200 Areas

With scoping completed, preparation of project proposal has been temporarily suspended. Work is to be resumed in early June, 1954.

ER A-3106 - 300 Area General Improvement Program

The preliminary design, scoping, and preparation of project proposal are each about 50% complete. The rough draft project proposal is being reviewed by interested parties, and a split of funds is being considered. Of the total, $185,000, about $109,000 would be applicable to the Laboratory Area (Budget Item 2-23X-0955V), and about $76,000 would be applicable to 300 Area General Improvements (Budget Item 2-23X-5010).

ER A-3107 - Hanford Works Laboratory Exceptions

Work is progressing on all open work orders for Project CA-257, CA-381, CA-394, CA-414, and CA-421. It now appears that CA-257, Health Instrument Control and Development Laboratory - 300 Area can be completed during June, 1954.

C. RELATED FUNCTIONS

The work load for field inspectors has reached the highest point of the present Expansion Program; however, there has been no increase of manpower. During May a system of statistical sampling was established for use on large quantity orders. The results of this inspection system have been excellent.

The Corrosion Testing Program has continued at about the same rate; however, the majority of the samples are being processed by the Lukens Laboratory which is nearer the fabrication sites.

Following discovery of excessive inclusions of foreign material in one heat of 304-L stainless plate, it was decided to replace the defective plate with acceptable steel for Purex vessels. The replacement program has progressed satisfactorily. Decision was also reached to redesign vessel supports and to X-ray all welded piping which is being used in the critical services of Purex.

The problem of repair or replacement of process water pumps for 100-K Area was not fully solved. Additional studies are being made, and additional tests are being conducted. Delivery of vertical rod cylinders has been slow, and the vendor for blowers has delayed delivery by his refusal to perform required performance tests. Production of process nozzles, vertical safety rods, horizontal rods, and pigtails has improved.

Delivery of Recuplex vessels was about 50% complete, and the rate of delivery has improved. However, the control valves appear to be a limiting item, since 14 of the 376 required have been shipped.

Five Redox towers have been shipped, and the remaining three towers have been promised for delivery during the first half of June, 1954.

Following is a resumé of Inspection and Materials Unit activities during the month:

ITEM	NUMBER
Total orders on hand requiring inspection	1212
Cumulative number of orders assigned to inspectors	1140
Number of orders assigned to inspectors this month	180
New orders received by Inspection during the month	174
Orders completed	133
Total requisitions for engineered equipment transmitted for Expansion Program	116
Total orders of engineered equipment placed for Expansion Program	131

At the end of May there had been grand totals of 2846 Expansion Program requisitions for engineered equipment transmitted, and 2761 placed.

Reproduction output was 557,160 square feet during the 20 regular working days, including 248 hours overtime. The major orders processed during the month included 13,331 prints for Purex and 6268 prints for 100-K Area.

Estimating Unit completed 26 estimates during the month. The completed estimates comprised the following: project proposal - 10, comparative - 8, fair cost - 2, scope - 5, and miscellaneous - 1.

Field Surveys completed assistance with unitization of five projects; performed routine surveys for Gable-Butte Railroad, and began test work requested by Engineering Standards Council.

D. CRAFT LABOR

The local Building Trades Council called a work stoppage by all construction craftsmen on May 5, 1954, as a protest against the presence of Cisco Construction Company, a non-union contractor. On May 7 the A.E.C. stopped work being performed by Cisco, and the construction craftsmen returned to work. Cisco then filed a charge of unfair labor practice with the National Labor Relations Board. A hearing was conducted the week of May 17, and the NLRB filed a restraining petition in Federal Court. A direct result of this agitation was cessation of work by Cisco on the 151-KW and KE substations and the Recuplex CAW Facility.

Arbitration maneuvers concerned with the demand of construction bus drivers for isolation pay have proceeded toward a hearing about the middle of June, 1954. The Hanford Construction Contractors Committee has employed a San Francisco law firm to represent its case with the Teamsters' Union.

The retiring International President of the Boilermakers' Union, Charles J. McGowan, is being replaced by William A. Calvin, effective July 1, 1954.

Effective in March, 1954, Oswald S. Colclough, Dean of Faculties, George Washington University, was appointed a member of the Atomic Energy Labor-Management Relations Panel. This "Ching Panel" is now composed of Chairman Cyrus M. Ching, Thomas Holland, Arthur Ross, Rev. Leo C. Brown, and Dean O. S. Colclough.

On the Purex project, the turnover of welder-plumber personnel was exceedingly high during the latter part of May. This resulted from a division of present forces into a three-shift operation. If this trend continues, or if replacement is difficult, the Purex project could be seriously delayed.

Percentages of voluntary terminations from the two major construction contractors remained high during the month of May. Kaiser Engineers and Associates lost 10.6%; Blaw-Knox and Associates lost 10.7%. Voluntary terminations from J. A. Jones Company increased from 1.7% to 2.1%.

REPORT OF VISITORS

To Hanford

None

Official Trips to Other Installations during May, 1954

C. W. Hendricks visited the following companies from May 2 to May 9, to visit reproduction facilities and attend demonstrations of reproduction processes: General Electric Company, Schenectady, New York; Rochester Club, Rochester, New York; Eastman Kodak Company, Haloid Company, and Paragon-Revolute Company, Rochester, New York.

H. H. Hubble visited the following companies from May 3 to May 10, to discuss material problems with vendors: Electric Boat Company, Groton, Connecticut; Pfaudler Company, Elyria, Ohio; Alloy Fabricators, Perth Amboy, New Jersey; Steel and Alloy Tank Company, Newark, New Jersey; and C. L. Gougler & Company, Kent, Ohio.

W. W. Walker visited the following companies from May 3 to May 6, to set up control methods and to coordinate inspection activities: Ilco Tube Bending and Harvey Machine Company, Los Angeles, California; Pacific Coast Engineering, San Francisco, California; Todd Shipyards and Western Gear Works, Seattle, Washington.

C. P. Lawson visited General Electric Inspection Office, Seattle, Washington, on May 14 and 15, to coordinate inspection activities.

J. C. Hamilton visited Electric Boat Company, Groton, Connecticut, on May 4 and 5, to establish test procedures; and he also visited Alloy Fabricators and Alloy Tank, Newark, New Jersey, on May 6, for coordination of inspection activities.

W. D. Richmond visited Asco Sintering Company, Los Angeles, California, on May 6 and 7, to discuss fabrication of absorbing rings.

M. L. Oldfather visited Pfaudler Company, Elyria, Ohio, from May 11 to May 14, to investigate the problem of vessel supports.

H. E. Hanthorn visited Pacific Coast Engineering, Alameda, California, from May 10 to 12, to expedite procurement of towers.

F. H. Ames visited Van Vetter Company, Seattle, Washington, on May 13, to approve drawings of laboratory hoods.

C. F. Quackenbush visited Bingham Pump Company, Portland, Oregon, on May 12 and 13, for conference on Purchase Order KER-6664.

G. G. Taylor visited Oak Ridge Operations Office, Oak Ridge, Tennessee, on May 13 and 14 to attend A.E.C. Safety and Fire Protection conference. He was accompanied by L. E. McReynolds, J. A. Jones Construction Company.

M. G. Patrick visited American Monorail Company, Cleveland, Ohio, on May 17 to consult with vendors on monorail equipment; and he visited General Electric Company, Schenectady, New York, on May 18, to witness testing of equipment.

D. J. Quigley visited General Electric Realty Company, Schenectady, New York, of May 21 to May 28 for conference with Mr. Nowell.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - MAY 1954

EMPLOYEE RELATIONS SECTION

The number of applicants interviewed in May was 1,604 as compared with 1,689 for April. In addition, 181 new applicants applied by mail. Open, nonexempt, nontechnical requisitions increased from 371 at the beginning of the month to 397 at month end. Eighty employees were added to the roll and 72 removed during the month. Separations rate decreased from .67% for fiscal month of April to .64% for fiscal month of May. These rates when converted to annual basis are 8.74% and 8.35% respectively. During May, 55 new requests for transfer to other type work were received by Employment, and 63 transfers were effected. Attendance recognition awards were distributed to 194 employees in May, including 37 who qualified for four-year awards.

Eight employees retired during the month. One hundred and forty-two visits were made to employees confined to Kadlec Hospital, and 45 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 97.7%, in the Insurance Plan 99%, and the Employees Savings and Stock Bonus Plan 49.3%. At month end there were 766 registered under Selective Service and 767 military reservists were on the roll. Since August 1, 1950, 335 employees have terminated to enter military service, of which 94 have returned, 19 have not claimed reemployment rights, leaving 222 still in military-leave status.

A total of 71 new employees attended orientation meetings. Of this number, 97.1% have signed up to participate in the Pension Plan, 98.5% in the Insurance Plan, and 81.6% in the Good Neighbor Fund.

Four scholarships and two loans were granted to children of HAPO employees for the 1954-55 school year under the Company's Educational Assistance Program.

The local GE dealer held an open house for GE employees and their families the evening of May 27, at which time the full new line of GE appliances was demonstrated.

Sixty-six adopted suggestions were approved for awards in May, resulting in cash awards totaling $1,420 with a total net savings of $10,950.90, which included one award for $560 and another for $175.

Training and Development programs and activities were as follows: Exempt Orientation, HOBSO II, Effective Human Relations, Principles and Methods of Supervision, Conference Leading, and the J.I.T. Work Shop.

EMPLOYEE RELATIONS SECTION (Continued)

Plant-wide information program was developed and conducted to assist in the initiation of the GE Service Recognition Plan. Service Recognition pins were distributed for presentation on June 1, effective date of the plan, to 5 employees with 20 years, 11 employees with 15 years, 23 employees with 10 years, and 4,723 employees with 5 years of service.

The "Here's Hanford" film was shown to 12 plant groups totaling approximately 350 employees.

PUBLIC RELATIONS SECTION

The News Bureau issued 49 releases during the month. The volume of newspaper, trade magazine, and otherreleases this month increased considerably due to the large number of talks being given before public groups and papers being presented at technical meetings.

Hanford was represented by several speakers at the following meetings during May: Information Meeting on Hot Laboratories at Brookhaven, Annual Convention of the American Water Works Association, Western Branch meeting of the American Public Health Association in Seattle, Los Angeles and Richland Chapters of the AIEE, Spokane Kiwanis Club, and the Colville Chamber of Commerce.

Eight signed articles by GE authors at Hanford were forwarded to various trade and technical publications during the month.

A rapidly growing volume of requests has been received from GE public relations offices in New York and Schenectady for information releases and photographs concerning Hanford. Copies of 26 papers and speeches prepared at Hanford were sent to the Public Relations Services Division to become a part of a source file of information on GE's work in the atomic energy field.

A trial television program written and produced this month, was used by a Spokane station in saluting Richland on the occasion of completion of the first portion of the new cable installation. The program was sent out to all receiving sets in the area served by the station. Seattle stations have heard of our plans to produce information releases suited to their media and have expressed strong interest in receiving any programs we may have to offer them for use as "public service" telecasts.

A total of 296 assignments were completed by the Photography Unit during the month, and 9,541 prints were produced, of which 4,684 were "A" and "B" employee identification badge photographs. In addition, the Photography Unit took 17,375 feet of 16mm film for the construction progress motion picture being produced by the Audio-Visual Unit for the AEC.

EMPLOYEE AND PUBLIC RELATIONS SUMMARY

SALARY ADMINISTRATION SECTION

A salary review covering all exempt employees who were not reviewed in the Professional Review in the fall of 1953, was performed.

Conferences were held with all department managers relating to the organization structure of their departments on July 1, 1954. Information developed in these conferences was recorded in a set of structural organization charts. A set of these charts, along with additional information, was mailed to Paul E. Mills of the Management Consultation Services Division. Work was begun on a set of functional charts to accompany the structural charts.

Work continued in reconciling positions within and between departments, with the objective of assigning each exempt position to a level in the Company salary plan.

A further substantial number of employees formerly paid according to the Professional Salary Plan was transferred to described positions in the E.A.O. Salary Plan.

UNION RELATIONS SECTION

A hearing will be held in Richland in the near future to arbitrate a grievance involving requests for transfer to bargaining unit jobs.

Contract negotiation meetings have been held throughout the month with the Hanford Atomic Metal Trades Council, Hanford Guards Union, and the Building Service Employees International Union. On June 7 formal acceptance of the Company's offer was received from the HGU.

Following the strike of all construction crafts protesting the presence of Cisco Construction Company, a nonunion contractor, on a job, Cisco filed an unfair labor practice charge with the National Labor Relations Board and a hearing was conducted by the Board the week of May 17. As a result of the hearing, the NLRB, on May 24, sought a temporary injunction in Federal Court restraining the unions from further strikes over this issue. The Court denied the petition but specifically provided that an injunction would be issued immediately in the event of further work stoppages. Board hearings on the unfair labor practice charge will proceed on June 9 in Richland.

The issue of isolation pay for construction bus drivers is expected to be arbitrated about June 15.

UNION RELATIONS SECTION (Continued)

That the continuous campaign to reduce preferential rates is effective was revealed this month when a study indicated that presently only 354 employees are being paid "red circle" rates as compared to the 3,422 employees paid preferential rates following the installation of the existing wage rate plan on July 19, 1948.

TECHNICAL PERSONNEL SECTION

Against an authorization of forty technical graduates, thirty-two have been hired and five are already on the roll. These graduates are primarily in chemical and mechanical engineering, chemistry and metallurgy. In addition, ten business graduates have been hired against an authorization of twelve from the Financial Department. Ph.D. recruiting has not brought any further acceptances however favorable negotiations with a number of candidates who have visited, or plan to visit us soon, indicate that this total will increase to 10 or 12 within a short time. To date three acceptances have been received from Ph.D.'s.

During May three rotational trainees were placed in departments and two new employees joined the program. Counting these changes, the total dropped from 41 to 40 trainees. We have been assured of a substantial number of placements soon after July 1. Also, Selective Service losses have been carefully studied by Messrs. Curtis and McElveny, since the number of rotational trainees entering military service has increased sharply from practically none to three or four per month at present.

As part of our continuing program with university relations, a visit was made to the University of Wisconsin during this month.

HEALTH AND SAFETY SECTION

One claim alleging hearing loss arising out of occupational exposure has been submitted for transmittal to the State Department of Labor and Industries. Several similar claims are expected shortly.

A second lawsuit was filed in Superior Court May 4 against General Electric and the Manager of Industrial Medicine, claiming damages of $90,000 and costs for alleged negligence in not informing an employee of questionably abnormal shadows on a chest x-ray made during routine medical examination on March 1, 1949.

Sickness absenteeism was 1.62% as compared with 1.66% for April, while total absenteeism was 2.52% as compared with 2.43% for April.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

HEALTH AND SAFETY SECTION (Continued)

There was one major injury recorded during the month of May. The plant record as of May 31, 1954, indicates an accumulation of 4,358,000 man hours of exposure which covers a 96 day no-lost-time injury performance. The one injury occurred in the Community Operations Section. There were 289 minor injuries during May, as compared to 387 in April.

COMMUNITY OPERATIONS SECTION

Richland experienced an electrical outage throughout the community on May 6 from 6:36 AM to 7:13 AM because of a splice pulling out on the 115 KV transmission line between Richland and North Richland. Service was restored by re-routing energy and the break was repaired by the Plant Electrical Distribution forces.

COMMUNITY REAL ESTATE SECTION

As of May 31 there were 280 housing applications pending.

COMMUNITY TRANSFER STUDY

Detailed studies are continuing in order to complete plans for the Congressional Hearing on the Community Transfer which will be held in Richland on June 19.

ORGANIZATION AND PERSONNEL

Total on roll May 1, 1954	865
Accessions	27
Separations	32
Total on roll May 31, 1954	860

(Totals include 40 Rotational Trainees)

1210097

Employee and Public Relations

EMPLOYEE RELATIONS

Employment

	April, 1954	May, 1954
Applicants interviewed	1,689	1,604

542 of the applicants interviewed during May were individuals who applied for employment with the Company for the first time. In addition, 181 applications were received through the mail.

Open Requisitions	April, 1954	May, 1954
Exempt	1	---
Nonexempt	371	397

Of the 371 open, nonexempt, nontechnical requisitions at the beginning of the month, 190 were covered by interim commitments. Of the 397 open, nonexempt, nontechnical requisitions at month end, 247 were covered by interim commitments. During May, 103 new requisitions were received requesting the employment of 124 nonexempt, nontechnical employees.

	April, 1954	May, 1954
Employees added to the rolls	101	80
Employees removed from the rolls	98	72
NET GAIN OR LOSS	+ 3	+ 8

Separation Rate:	Fiscal Month April, 1954		Fiscal Month May, 1954	
	Male	Female	Male	Female
	.39%	1.90%	.33%	1.98%

Over-all Separation Rate:	Fiscal Month April, 1954	Fiscal Month May, 1954
	.67%	.64%

During May, 9 employees left voluntarily to accept other employment, 5 left to enter military service, and 1 left to enter business for self.

Employee and Public Relations

EMPLOYEE RELATIONS

Transfer Data

Accumulative total of requests for transfer received since 1-1-54	311
Number of requests for transfer received during May	55
Number interviewed in May, including promotional transfers	67
Transfers effected in May, including promotional transfers	63
Transfers effected since 1-1-54 including promotional transfers	256
Number of stenographers transferred out of steno pool in May	3
Transfer requests active at month end	293

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	3	61	1	65
Re-engaged	—	—	—	—
Reactivates	—	14	1	15
Transfers	—	—	—	—
TOTAL ADDITIONS	3	75	2	80

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	14	37	—	51
Removals from rolls(deactivates)	—	21	—	21
Transfers	—	—	—	—
TOTAL TERMINATIONS	14	58	—	72

GENERAL

	4-1954	5-1954
Photographs taken	212	158
Fingerprint impressions	172	130

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	4-1954	5-1954
General Electric cases	146	127
Facility cases	33	30
TOTAL	179	157

Employee and Public Relations

EMPLOYEE RELATIONS

INVESTIGATION STATISTICS

	4-1954	5-1954
Cases received during the month	154	200
Cases closed	113	178
Cases found satisfactory for employment	169	170
Cases found unsatisfactory for employment	12	3
Special investigations conducted	1	33
Cases closed before investigation completed	50	53

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6584
One-year awards made in May for those qualifying in April	52
Total two-year awards to date since January 1, 1950	2249
Two-year awards made in May for those qualifying in April	58
Total three-year awards to date	996
Three-year awards made in May for those qualifying in April	47
Total four-year awards to date	250
Four-year awards made in May for those qualifying in April	37

During May, 10 people whose continuity of service was broken while in an inactive status were so informed by letter.

Recruitment at Dunwoody Industrial Institute and at Valparaiso for needed instrument trainees was successful; 58 interested students were interviewed, of which 27 are under active consideration.

Clerical - The Minnesota Clerical Test and the Wonderlic Personnel Test were used in 45 cases to aid in the selection of clerical applicants.

Instrument Trainees - Seven prospective instrument trainees were tested, four of which are being processed for further consideration.

In two cases, tests were given to candidates for production jobs. In both instances, there was doubt as to which of the Manufacturing Sections they would best fit, sc tests were employed to give us another indication.

Notice of reduction of force at the 2101 Building was given May 28, to become effective as of June 11. The number of expeditors totaled 12 and 1 General Clerk "B", of which it appears 11 will be placed or at least offered work in another classification.

Employee and Public Relations

EMPLOYEE RELATIONS

Employee Benefits

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	142
Salary checks delivered to employees at Kadlec Hospital	42
Salary checks delivered to employees at home	3

At month end, participation in the Benefit Plans was as follows as compared with last month's participation:

	April	May
Pension Plan	97.6%	97.7%
Insurance Plan	99 %	99%
Employees Savings and Stock Bonus Plan	49.1%	49.3%

Seventeen letters were written concerning deceased employees and their families during May, regarding payment of monies from the Company and answering questions.

Since September 1, 1946, 145 life insurance claims have been paid totaling $918,013.

Eight employees retired during the month of May, namely:

Thomas H. Edwards	M-12254-534	Normal Retirement
Raymond H. Hare	M-774-346	" "
George E. Ericson	W-2148-762	" "
Fred C.Schermer	W-4848-627	" "
Frances E. Parratt	W-6734-353	" "
Joseph A. England	W-7243-627	" "
Nels O. Nelson	W-9183-976	" "
Oscar Haugen	W-5404-353	Optional Retirement

During May, 6 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date, 295 employees have retired at Hanford, of which 160 are continuing their residence in this vicinity.

71 new employees attended Orientation Programs given by members of this group during the month of May. Of this number, 97.1% have signed up to participate in the Pension Plan, 98.5% have signed up to participate in the Insurance Plan, and 81.6% have signed up to participate in the Good Neighbor Fund.

One member of this Unit assisted as a member of the Company's task force in allocating scholarships and loans to GE employees and children of employees for the 1954-55 school year. Four scholarships and two loans were granted to children of HAPO employees.

Employee and Public Relations

EMPLOYEE RELATIONS

Employee Benefits

The Atomic Energy Commission has indicated by letter that they will not endorse requests for deferments under Selective Service except in unusual cases for individuals who have had deferments for two years. Further, the Commission has requested that the Company establish a planned program for replacement of employees who had deferments exceeding two years. No formal action has yet been taken by HAPO concerning this matter pending exploration of its impact on other segments of the Atomic Products Division with the view to uniform action being taken by the Division. In the interim, it is expected that some scientists and engineers will be lost to the service, in fact since 4-1-54 a total of five has been lost which is more than had been lost over a period of several years.

During the month a letter was forwarded to supervisors of employees who are non-members of the GE Insurance Plan. The letter requested the assistance of the supervisors in enrolling these people in the Plan.

The local GE dealer held an open house for GE employees and their families the evening of May 27, at which time the full new line of GE appliances was demonstrated.

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		767
Number of reservists classified in Category A	117	
Number of reservists classified in Category B	69	
Number of reservists classified in Category C	69	
Number of reservists classified in Category D	512	
Number who returned to active duty to date		139
Number who returned to active duty in May		1
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	766
Employees registered who are veterans	248
Employees registered who are non-veterans	303

1211902

Employee and Public Relations

EMPLOYEE RELATIONS

Military Reserve and Selective Service

Deferments requested to date (including renewals)		1279
Deferments granted		1028
Number of employees for which deferments have been requested		158
Number of employees classified in Category B	0	
Number of employees classified in Category C	1	
Number of employees classified in Category D	157	
Deferments denied and appealed at state levels		11
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		5
Deferments denied by local board and not appealed		10
Deferments denied by state board and not appealed		45
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		0
Deferments requested, later withdrawn		0
Deferments pending		30

Military terminations since 8-1-1950 are as follows:

Reservists recalled		117
Selective Service		213
Women employees enlisted		5
	TOTAL	335

Employees returned from military service

Reservists		56
Selective Service		38
	TOTAL	94

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 System	April	May	Total Since 7-15-47
Suggestions Received	174	160	13980
Acknowledgements to Suggesters	123	217	
Suggestions Pending Acknowledgement	84	27	
Suggestions Referred to Depts. for Investigation	123	217	
Suggestions Pending Referral to Departments	84	27	
Investigations completed and Suggestions Closed	267	214	
Suggestions Adopted - No Award	2	0	
Adopted Suggestions Approved by Committee for Award	64	66	
Total Net Cash Savings	$ 11,710.32	$10,950.90	
Total Cash Awards	$ 1,150	$ 1,420	
Total Suggestions Out to Investigators	576	666	

The highest award of $560 was paid to an employee in the Reactor Section for his suggestion regarding a revision in the method of removing panellit gauges when making range changes on a mass basis.

An employee in the Technical Section received the second highest award of $175 for his suggestion to use Al-Si instead of aluminum cores in the fabrication of dummy pieces, resulting in a savings of material and labor.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 59 insurance companies and investigation agencies during the month of May, 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	April, 1954 Long Forms	April, 1954 Short Forms
	56	449
	May, 1954 Long Forms	**May, 1954 Short Forms**
	52	432

Total Since Sept., 1946 - 20,649

Claims reported to Travelers Insurance Co.	May, 1954	April, 1954
	* 6	12

Total Since Sept., 1946 - 847

*Of the claims reported to Travelers Insurance Company during the month of May four were property damage claims and two were bodily injury claims.

Employee and Public Relations

EMPLOYEE RELATIONS

Liability Insurance

On May 4, 1954, a Summons and Complaint was served upon the and on behalf of the plaintiff, The action is based on alleged negligence of the defendants in that they allegedly advised the plaintiff that physical examinations had revealed no serious abnormal conditions whereas active pulmonary tuberculosis was present. The total amount alleged is $90,000 plus costs. The matter has been referred to the Travelers for defense.

On August 28, 1953, age 3, was drowned in the irrigation ditch near the intersection of Duportail and Thayer Drive. Suit was brought by the parents based upon wrongful death arising out of the alleged negligence of in maintaining an unguarded irrigation ditch in the City of Richland. The plaintiffs were awarded a judgment of $22,666 and then filed a motion for judgment notwithstanding the verdict and for a new trial. In May, Judge Hunter submitted his Memorandum Opinion in which the motion for judgment notwithstanding the verdict was denied but which granted a new trial unless the plaintiffs consented to a reduction from $22,666 to the sum of $7,500. We have not yet learned the plaintiffs' position.

General

In May we received a Treasurer of the United States check in the amount of $2760 which represents interest for the period 11-1-53 to 5-1-54 on the investment of $200,000 for the Pension Reserve Account. The money was invested in U. S. Government registered securities by the State Finance Committee in accordance with modification number four to the Agreement between the Department of Labor and Industries, the Atomic Energy Commission, and the General Electric Company regarding Industrial Insurance.

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

EXEMPT ORIENTATION was held May 3, with 14 new non-supervisory personnel attending. The Manager of Employee Relations Section welcomed the group to the meeting and was the guest speaker at a luncheon for the group at the Desert Inn. This presentation covers company organization, sources of information, salary plan, labor laws, and human relations in industry.

HOBSO II was presented May 6, with an attendance of 5 supervisors. This program explains the effects of war-time economy, government controls, and post-war economy.

EFFECTIVE HUMAN RELATIONS six groups met for their second conference May 5, 11, 12, 18, 19, and 26, with 61 supervisors participating. This 12-hour program (three meetings) deals primarily with actual human relations case studies. Cases are presented through various films, records, and written background, allowing group discussion on these and other on-the-job cases of the supervisors attending.

The Supervisor of Training gave a preview of the Supervisor's Safety Program May 7, with an attendance of 17 exempt personnel from Safety and Fire Protection and Training and Development Units. As a result of the comments from those attending this meeting, various parts of the program have been revised.

PRINCIPLES AND METHODS OF SUPERVISION was presented to Groups #69 and 70 during two weeks of May 10-21, with 28 supervisors completing the course. Complete arrangements have been made for the PMS-dinner meeting to be held Tuesday evening, June 2 at the Desert Inn for Groups 67, 68, 69, and 70.

CONFERENCE LEADING was conducted May 17 and 25, with 18 exempt personnel participating. These meetings are directed toward stimulating interest in learning the techniques of leading group discussions.

The McGregor Program - On Why Training - was presented May 24 in the 300 Area to 26 members of management.

The first Hanford Operations JOB INSTRUCTION TRAINING work shop was conducted in 300 Area May 25, 27, and 28. There were 14 supervisors to complete this 10-hour program.

A member of Training spoke on "Improving Customer Relations" to 40 members of the Richland Senior Chamber of Commerce Tuesday morning, May 4, at the Desert Inn.

Employee and Public Relations
Employee Relations

The supervisor of Training during May completed contacting all section managers of Plant Auxiliary Operations Department. These contacts were to get the opinions and suggestions of the section managers as to how Training can help supervision with their problems.

Three members of Training attended local union negotiation meetings May 12 and 14.

Three Training members attended the Pacific Northwest Personnel Management Association meeting in Toppenish Tuesday evening, May 11. One of the members of Training gave an hour talk on the General Electric 9-Point Better Job Program. There were 30 members present.

Economic films "Joe and His Government" and "Joe Makes a Living" were previewed by the Training staff May 19.

A member of Training gave a talk on "Personal Considerations" to 20 members of The Knights of Columbus at a breakfast meeting Sunday, May 23 in Pasco.

During the month, there were 23 requests for program attendance transcripts and 15 requests for Business English reference sources.

Supervisor's Handbook records:

Number Issued During May - - - - 3

Number Returned During May - - - 5

On Hand - - - - - - - - - - - - - 178

Of the 178 on hand 62 are not usable because of missing pages. The remaining 116 are ready for issuance.

Employee and Public Relations

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Initiation of the GE Service Recognition Plan at Hanford involved a plant-wide promotion handled by Special Programs. This included development of a promotion program, two GE NEWS stories, three photographs with captions, one full page GE NEWS message, items in two Management NEWS Bulletins and an answer to a "Can You Tell Me?". In addition, the actual distribution was facilitated through preparation of letters of instructions which were sent to the General Manager, all Department Managers, all Section Managers and six Sub-Section Managers; and the pins were actually delivered to distribution points within the plant by the Special Programs General Clerk.

For the initial distribution, 5, 10, 15 and 20-year pins were to be distributed on June 1 to more than 4700 HAPO employees. Of these, 5 are 20 year people; 11 are 15 year people and 23 are 10 year people.

Publicity concerning the Kadlec Hospital open house released during the month included an editorial cartoon and a full page of photographs in the May 7 GE NEWS. Three photographs and captions were published in the May 14 GE NEWS reporting on the open house (approximately 250 people attended this sixth annual open house).

Requirements for use of more than one color on printed materials produced in the plant print shop, as provided by Government printing and binding regulations, were discussed with the Office Unit Chief Supervisor following his rejection of a two-color library bulletin letterhead developed by Employee Communications.

Three Management NEWS Bulletins were prepared and distributed to all HAPO management, and two Employee Relations News Letters produced in New York were distributed.

A GE NEWS message to all employees on the subject of job attitude was prepared for signature of the General Manager and published in the May 14 issue.

News of the Company's latest proposal to HAPO unions was communicated via the priority message procedure, a Management NEWS Bulletin and through the GE NEWS.

A proposed letter to Hanford's non-participants in the Insurance Plan was developed for signature of Employee Benefits supervisor.

The safety topic for June, "The Majority Rues," was prepared. At the request of Safety and with the concurrence of Training and Development, a ten-page leaflet entitled, "The Vital Step," was prepared for distribution to supervisors attending the forthcoming safety training courses.

At the request of Public Relations, 150 copies of "Here's Hanford" were reprinted and delivered to the Richland Chamber of Commerce.

The June health bulletin, "Heart of the Trouble," was prepared and printed. The safety film, "Get-a Grip on Yourself," which was borrowed to accompany the May health bulletin, was shown 15 times to approximately 400 GE employees. On hundred copies of a health poster calling attention to the May health bulletin were placed throughout the plant.

1211066

Employee and Public Relations

EMPLOYEE RELATIONS

Special Programs was given the additional responsibility of preparing as well as distributing, the official holiday notices. The first such notice prepared concerned the Memorial Day holiday.

The Elliott Service Company poster service, from which 100 copies of a new poster are received each week, was renewed for another year.

Art work was completed on the first of a series of six full-page GE NEWS messages on "Your Company." Layouts and copy for each message have been approved.

May issue of "Your Manufacturing Month" was prepared for distribution to all Manufacturing exempt employees.

A Special Programs Public Relations Writer addressed the Public Relations class at the University of Washington's School of Communication at the University's invitation. He spoke about the Company's employee and public relations activities.

Roughs have been completed on all the art work required for "Operation 4 S".

1000 copies each of several instruction cards were revised and reprinted at the request of Bioassy.

A total of 33 projection engagements were met with showings to approximately 1000 employees. This included 12 showings of the film, "Here's Hanford" to approximately 350 people.

Eleven films were received from offsite for plant showings.

The following posters were distributed throughout the month: 100 copies each of four Elliott Service Company posters, 100 copies of a health poster, 100 copies of a G.E. benefit plan poster and 100 holiday notices. In addition, all suggestion system boxes were serviced and the posters in them changed twice, and reposting of Sheldon-Claire Company employee relations posters was continued.

Two hundred copies of "Adventures in Electricity" and two hundred copies of "Adventures Inside the Atom" were distributed through the employee information racks.

The importance to all Hanford people of the proposed disposal legislation for Richland was brought before employees through continual publicity in the GE NEWS. Publicity included: story advising employees they may join committees formed by the Richland Community Council for the purpose of studying legislation; stories urging attendance at Town Hall meetings where legislation was discussed; and questions and answers on the legislation. Readers were informed that questions submitted to the GE NEWS would be answered by the AEC Community Management Division.

GE NEWS features of high informational value and human interest included:

Conversion of former Hanford shoe trailer to the Civil Defense and Plant Disaster Mobile Center.

Human interest feature on old-time ferry operated by horses on the Columbia, included pictures taken over 50 years ago.

Employee and Public Relations

EMPLOYEE RELATIONS

Ten-year Kadlec employees were pictured along with Kadlec hospital in its early years to publicize the Kadlec open house and its tenth anniversary.

Fourth in a series of double-page spreads on HAPO Departments was published on Radiological Sciences.

Attention of employees was called to efforts of Manufacturing Department to effect cost savings in HAPO fuel consumption.

Human interest feature was centered around employee stricken by polio and his remarkable determination which enabled him to recover sufficiently to return to work.

Activities of Electrical Distribution linemen in tying in permanent power lines to 100-K Area were shown pictorially.

Employees were advised through GE NEWS of an open house to be held at the local GE dealer, Pleiss-Davis, to show appliances available under the GE Purchase Plan.

Announcement was made in GE NEWS of the Company's proposal to HAPO's union of a general pay increase and other economic benefits.

First in a series of syndicated articles on weight control was published in the GE NEWS. Articles were reviewed by the Health and Safety Section which supplied the GE NEWS with a local tie in as the result of a study made at Hanford of over weight people.

Art work prepared during the month for the GE NEWS by the Employee Communications commerial artist included: one editorial cartoon, layout and final art for three full page messages, and miscellaneous photo retouching.

Layouts and final art work were developed for the June and July health bulletins and the June safety topic of the month.

Layout and final art were developed for a ten-page, plus cover, pamphlet entitled, "The Vital Step," to be utilized in a safety program for supervisor.

Final art work was completed on two radiation posters for Radiation Section, and initial layouts for the forthcoming "Operation 4 S" Suggestion System cost reduction program were completed.

Art work for a portion of the JIT program was produced at the request of Training.

An original and final art work for a two-color library letterhead, and layout for the letterhead to be printed in a single color, were developed.

Employee and Public Relations

PUBLIC RELATIONS

During the month of May, the News Bureau issued 49 news releases. The breakdown by category, distribution and content was as follows:

Subject		Distribution	
Pay & Benefits	4	Local	35
Employment Services	9	Daily	5
Good Will	3	Tri-City HERALD and Columbia Basin NEWS	3
Technology & Research	16	Special	6
Utilities and Public Works	1		
Safety, Fire, Security	3		
Administration & legal	3	Content	
Health, Medicine, Sanitation	1		
Plant Services	4	Information	3
Police, Fire	1	Pictures	2
Richland	3	Short release	24
Other Communities	1	Long release	20
Total	49		

Of the 35 local releases listed above, 13 were also sent to the science engineering list, one to the business list. Of the 5 daily releases, two were also sent to the local and science engineering lists, two were also sent to the local, science engineering, and Columbia river lists, and one was sent to the local list.

Four requests for information and pictures were received this month. One was a request for information regarding Richland and Hanford, and fact sheets and background material was sent. Three requests were received for pictures and information about the "plastic man" and other types of protective clothing. One was from a publishing firm in England, one was from a free-lance writer, and one was from a publishing firm and was a request for pictures to be included in a set of encyclopedia. Some of these pictures were taken especially for these requests.

An interview was held with a reporter from each of the two local newspapers, in an effort to clarify Dr. Fuqua's role in the case of Curtis T. Swearingen vs GE and Philip Fuqua. Both reporters agreed, since he was not responsible for the misreading of the x-ray in question, that it was only right that Dr. Fuqua's role in the suit be explained in their stories.

News Bureau writers toured the 300, 200 and 100 areas during the month. This tour was planned to acquaint writers with area activities that might have publicity potential.

Five pictures concerned with various phases of the heat converter system were sent to the Editor of MONOGRAM. These pictures were taken especially to comply with his request.

Employee and Public Relations

The following papers and speeches were cleared this month:

Presentation or Submission Date	Subject and Organization or Publication	Author
5/4	Customer Relations; Richland Chamber of Commerce	V. J. Byron
5/10	"Design and Testing of the World's Fastest Reversing Electric Drive;" Richland AIEE	W. J. Ferguson
5/11	"Noise Measurement and Interpretation;" Industrial Hygiene Section, Western Branch, American Public Health Association, Seattle	R. H. Scott
5/14	"The Thermal Neutron Utilization of a Pile with Two Charging Faces;" Master's Thesis	G. W. Anthony
5/15	"Radiotoxicology;" Lecture at Washington State College	L. K. Bustad
5/17	Film, "A is for Atom;" Prosser Methodist Church Men's Group, Boy Scout Group	W. K. MacCready
5/18	"A Test Tube Community;" Colville Chamber of Commerce	R. H. Hopkins
5/20	"The Atomic Energy Industry from a Business Man's Standpoint;" Spokane Kiwanis	W. E. Johnson
5/20	"Fire Prevention Engineering;" Nat'l. Fire Prevention Association, Washington, D. C.	F. J. McKinnon
5/21	"A Test Tube Community;" Richland, Pasco, Kennewick Seattle Chambers of Commerce	R. H. Hopkins
5/24	"The Physical and Biological Distribution of Radioisotopes in the Columbia River Below the Hanford Reactors;" American Water Works Association, Seattle	R. F. Foster & R. E. Rostenbach
5/26-28*	"Equipment for a Remotely Operated Laboratory-Scale Chemical Separation;" Information Meeting on Hot Laboratories, Brookhaven	L. F. Miller & E. M. Kinderman
6/11-12	Same Paper; ACS Regional Meeting, Richland	
5/26-28*	"Programming for Analytical Laboratories Supporting Research and Development Activities;" Information Meeting on Hot Laboratories, Brookhaven	E. W. Christopherson
6/11-12	Same Paper; ACS Regional Meeting, Richland	
5/26-28*	"Fiberglass Air Filters for Hot Laboratories;" Information Meeting on Hot Laboratories, Brookhaven	J. F. Gifford
5/26-28*	"Can Opening Facilities;" Information Meeting on Hot Laboratories, Brookhaven	H. J. Bellarts
5/26-28*	"Binocular Periscope Viewers;" Information Meeting on Hot Laboratories, Brookhaven	J. M. Holeman
6/2	"The Atomic Energy Industry from a Business Man's Standpoint;" Kennewick Kiwanis	W. E. Johnson
6/11-12	"Gross Metabolism of Water in the Rat as Deduced from Studies with Tritium Oxide;" ACS Regional Meeting, Richland	J. E. Ballou & R. C. Thompson
6/11-12	"Replica Techniques for Radioactive Materials;" ACS Regional Meeting, Richland	R. Borasky & B. Mastel
6/11-12(A)	"Absorption of Plutonium from the Gastro-Intestinal Tract of Animals"	W. D. Oakley & M. H. Weeks J. Katz

(A) Abstract Only

* All unclassified papers given at the Brookhaven meeting will be published in a special edition of NUCLEONICS.

Employee and Public Relations

6/11-12	"Isotopic Analyses of Solids Using A Modified Commercial 180°-Type Mass Spectrometer;" ACS Regional Meeting, Richland	G. J. Alkire & C. A. Goodall
6/11-12(A)	"Coulometric Determination of Phosphate;" ACS Regional Meeting, Richland	W. N. Carson & H. S. Gile
6/11-12(A)	"X-Ray Photometry in Chemical Analysis;" ACS Regional Meeting Richland	M. C. Lambert
6/11-12(A)	"Industrial Utilization of Fission Products;" ACS Regional Meeting, Richland	R. E. Burns
6/11-12(A)	"Some Kinetic Studies of the Tin (II) Reduction of Uranium (VI) in Hydrochloric Acid Media;" ACS Regional Meeting, Richland	R. L. Moore
6/11-12(A)	"The Determination of Dibutylphosphate;" ACS Regional Meeting, Richland	D. W. Brite
6/11-12(A)	"Porous Glass and Ion Exchange Membrane Salt Bridges;" ACS Regional Meeting, Richland	W. N. Carson & C. E. Michelson K. Koyama
6/11-12(A)	"A Systematic Approach to the Solution of Chromatographic Problems;" ACS Regional Meeting, Richland	J. E. Meinhard
6/11-12(A)	"Self-Diffusion of Uranium and the Uranium-TBP Complex" ACS Regional Meeting, Richland	H. T. Hahn
6/11-12(A)	"The Affinity of Ru(IV) for Chloride Ion and Evidence for the Polymerization of Uncomplexed Ru(IV) in Acid Solution;" ACS Regional Meeting, Richland	J. L. Swanson A. S. Wilson
6/11-12(A)	"An Instrument for the Rapid, Automatic Determination of Extraction Rates;" ACS Regional Meeting, Richland	W. P. VanMeter
6/21-25(A)	"Hanford Radiological Instrumentation;" AIEE Meeting, Los Angeles	P. L. Eisenacher
7/27	"Objectives in Nuclear Power Plant Design;" Richland Naval Reserve	W. J. Dowis
8/31	U. S. Army Guided Missile Training, Richland Naval Reserve	Ralph Gay
5	"Operation's Barometer by Difference Analysis;" FACTORY MANAGEMENT AND MAINTENANCE	F. W. Richardson
5	"The Effect of Metering on Domestic Electric Power Consumption in Richland, Washington;" AMERICAN CITY	F. J. Mollerus
5	"Attenuation of a Neutron and Gamma Ray Bean Emitted from a Pile;" NUCLEONICS	W. P. Stinson
5	"Assay of FE^{55} and FE^{59} in Biological Samples;" ANALYTICAL CHEMISTRY	J. H. Rediske & R. F. Palmer J. F. Cline
5	"Influence of Plutonium Concentration of Effectiveness of Therapeutic Agents;" SCIENCE	M. H. Weeks W. E. Oakley R. C. Thompson

(A) Abstract only

A new service for speakers was originated this month. A memo containing a recapitulation of the arrangements made for each speaking engagement will be sent to the speaker prior to his speaking engagement.

Employee and Public Relations

Copies of 26 papers and speeches were sent to B. S. Havens to be placed in the file of information on atomic energy which he is compiling in Schenectady. It was emphasized that material from the papers and speeches should be checked with us before it is used, since many of the papers and speeches were delivered several months and, in some cases, over a year ago, which may require further checking of some of the facts and figures.

The May issue of the Community NEWSLETTER was sent to community leaders in Pasco, Kennewick and Richland.

Letters inviting school officials and students to the Kadlec Hospital open house were sent to principals of the high school and the two junior high schools, and printed invitations were sent to all community leaders on our mailing list.

Scheduling is being done on the 100-K portion of the Construction Progress Motion Picture Program for the Engineering Department to coordinate film coverage in both East and West Units. Scheduling is also being done to add more comprehensive coverage of the Purex project which is approaching an important phase of installation of equipment. An unusual on-site prefabrication process filmed this month at the Purex location, will be used to illustrate cost saving features in this film.

At the request of a representative of the Engineering Department, 1000 feet of previously exposed Kodachrome footage of a model of the100-K Area Reactor was sent to the Los Angeles studios for a reprint. From this footage a sixteen-minute silent film was prepared for use in illustrating a lecture given at the School of Reactor Technology, Oak Ridge National Laboratory during the month. This film, which was edited to fit the lecture script, will be valuable for further use not only for off-site educational purposes such as the School of Reactor Technology, but also at HAPO for educational meetings concerning reactors. In this particular case the film supplanted the necessity of shipping the large model to Oak Ridge and therefore saved considerable expense and possible damage to the model in transit.

In cooperation with Operations Section, complete coverage including aerial photography, was made of the connect-on of the main power loop into the 100-K Area. This footage will serve both as part of the Construction Progress Motion Picture Program and for use by Operations.

Rough editing has been completed on two 1200-foot reels of Construction Progress motion picture film footage. Excavation and early phases of architectural construction of the 100-K Area reactor buildings and water facilities were covered in the two reels of film. Showings were held for G-E and Contractor Management in the field and comments received were very favorable. Additional phases, as yet not developed and processed by the Studio, require editing before the first segment of finished film can be prepared.

Production was started this month on a shortened version of the HAPO produced motion picture, "Here's Hanford," for showing to community and public organizations. The print will also be sent to various Public Relations Services Division offices for review to determine whether they will want additional reprints for further distribution.

Employee and Public Relations

A preliminary study of a color-sound slidefilm, intended to explain the Company's Insurance, Pension and Stock Bonus Plans to all employee audiences, and primarily for use in the HAPO Orientation Program, is being conducted. If it is determined that a good slidefilm can and should be produced, a request for approval will be made to the Department Manager by the Employee Relations Manager.

The HAPO produced motion picture, "Here's Hanford," played an important part in the Television debut of Richland on May 27. A 30-minute show was entirely written and produced as a Community service. A script was prepared for use by a Spokane Television station that included directions for use of portions of "Here's Hanford," narration for slides on unclassified project activities, and selected bridging.

Five hundred persons attending an evening premiere of "Here's Hanford," held Wednesday, May 12, in the Jason Lee auditorium. Among those present were the several hundred persons who took an active part in the production of the film. Plant showings of "Here's Hanford" were begun immediately after the preview, and totalled 13 to about 400 employees during the month.

In cooperation with Operations Section complete motion picture coverage, including aerial photography, was made of the connection of the main power loop into the 100-K Area. This footage will serve both as part of the Construction Progress Motion Picture Program and for use by Operations.

Four editions of "Hanford Science Forum" were written, recorded and released during the month.

An experimental edition of "Inside Hanford," a new type of radio program proposed by Public Relations, was written and recorded for audition by members of the Section. It is planned that this series will be ready for broadcast in July. Consideration is being given, however, to initiation of the series in September. This would be a more propitious time from the standpoint of the radio listening audience and we will also have a safe backlog of prepared program material.

The previously produced Kadlec Hospital Open House Documentary radio program, assembled from eighteen on-the-spot recordings, and bridged by narration, was auditioned by a member of KWIE's staff and given a preferred broadcasting time. It was originally scheduled for broadcast during the half hour normally occupied by a network show, 7:05 p.m. Monday, May 10, 1954. When the McCarthy hearings preempted this slot, it was rescheduled for broadcast twenty-five minutes later, a time normally occupied by another network show.

A twenty-minute interview to publicize National Hospital Week and the Open Houses of three local hospitals was recorded, released and broadcast. Participating were the administrative heads of Kadlec, Kennewick General and Our Lady of Lourdes Hospitals and a member of this Section who acted as announcer-engineer. The program was sponsored by the Public Health and Welfare Section.

Employee and Public Relations

A total of 1,737 negatives were exposed in covering the 296 assignments handled by Photography during the month. Prints totalled, 9,541, of which 4,684 were "A" and "B" photographs.

A total of 17,537 feet of 16mm motion picture film was exposed on the construction progress motion picture being produced for the AEC.

The two men of the Technical Photo Lab completed 57 of the total assignments this month, exposing 372 negatives and producing 1,745 prints, and 108 slides. The Photography Unit's Technical Photo Lab, which presently is running about eighteen photographic requests behind in its normal work load, is being supplied with additional space in the 3706 Building, 300 Area.

Special motion footage exposed during the month included the combustion of coal in a furnace, for Engineering Department. This was done in color, while the furnace was in normal operation, which presented problems involving extremely high temperatures. These pictures were among the first of their kind ever taken and were highly successful.

Another special motion picture photography assignment involved an automatic canning machine, to discover what portion of this machine was operating improperly. So many things took place at the same time that it was impossible for the human eye to examine and observe all movements at once. Through the medium of motion pictures the trouble was discovered and corrected.

See attached Statistical Report for Photography Unit.

PHOTOGRAPHY UNIT MONTH OF MAY, 1954	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	11" X 14"	N E G.	35mm Color Slides	35mm B&W Slides	3¼" X 4" B&W Slides	3¼" X 4" Color Slides	16mm B&W Film
EMPLOYEE & PUBLIC RELATIONS DEPARTMENT													
COMMUNITY OPERATIONS													
Fire			68					4					
Recreation			44	18	10			32					
Police		12	500		53			151					
Community Engineering					6			3					
Public Library		6	2	10	9			18					
PUBLIC RELATIONS				6	89			4					
News Bureau		124	2	47	641	15		169					
Public Information				12	78			16					
EMPLOYEE RELATIONS													
Personnel Practices					28								
G. E. News		47	6	10	309		4	257					
Special Programs					64			31					
Training					6			5					
Employment	240							128					
TECHNICAL PERSONNEL			5		2			4					
HEALTH & SAFETY													
Industrial Medicine								6					
Kadlec Hospital					12								
ENGINEERING DEPARTMENT													
DESIGN			10		64	20		38		3	14		1,200'
TECHNICAL			7		68	19	1	24	24		23		
Applied Research		100	8	27		850		159		2	34	16	
Fuel Technology			123	15	51	493		89					
Metallurgy									46				
Separations Technology					4	32		18					
Pile Technology			423		44	239		131	32		20		
Process Engineering						24		7			15		
Technical Information			1		14			14					

(Continued)

PHOTOGRAPHY UNIT MONTH OF MAY, 1954	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	11" X 14"	N E G.	35mm Color Slides	35mm B&W Slides	3¼" X 4" B&W Slides	3¼" X 4" Color Slides	16mm B&W Film
MANUFACTURING DEPARTMENT													
POWER & MAINTENANCE						9		6			4		
METAL PREPARATION				10	18	36		45			14		
PLANT ENGINEERING			934			25			25				
SEPARATIONS			61			8		48					
PROCESS					20	24		4					
REACTOR			95		15	308		112	7				
FINANCIAL DEPARTMENT		10						8					
RADIOLOGICAL SCIENCES DEPARTMENT													
BIOLOGY						2					18	10	400'
BIOPHYSICS			29		5			14			15	6	
PLANT AUXILIARY OPERATIONS DEPARTMENT													
Telephone Unit					3			3					
Reproduction				6									
Fire & Safety					32			14					
Security	2,356		12		42	21		36					
Electrical Distribution						10		16					
A.E.C. SECURITY	80							16					
A.E.C. SAFETY			57		79	105		105					
A.E.C. OPERATIONS					3	4		8					
TOTALS	2,676	299	2,387	161	1,769	2,244	5	1,737	140	5	157	32	1,600 ft

	MARCH	APRIL	MAY
Total Assignments	200	311	296
Total Negatives	856	1,511	1,737
Total Prints	10,587	10,042	9,541

Employee and Public Relations

UNION RELATIONS

Union Relations - Operations Personnel

In April two grievances were submitted by the Hanford Atomic Metal Trades Council for arbitration. One of those grievances has been withdrawn. However, the second one, 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 bargaining unit jobs are involved, will be arbitrated. Judge Harold Seering of Seattle is the next arbitrator on our agreed-upon panel and will be contacted regarding an early hearing in Richland.

On May 25-27 proposals, incorporating the economic improvements offered by the Company in national negotiations plus approximately 15 modifications of a local nature, were made to the Hanford Atomic Metal Trades Council, Hanford Guards Union, and Building Service Employees International Union. Negotiations have proceeded throughout the month. On June 7 formal acceptance of the Company's offer was received from the HGU. Substantial agreement has been reached with the HAMTC and settlement is expected momentarily. The BSEIU is expected to accept our proposal following their membership meeting on June 8.

Grievance Statistics:

A total of 51 grievances were received and four Step II grievance meetings were held during the month. A breakdown of the grievances received and processed follows:

All Departments

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Received this month	23	22	0	45	6
Received this year	140	34	1	175	18

Employee and Public Relations

UNION RELATIONS

Grievance Statistics (Contd.):

	All Departments				
	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Step I					
Pending April 30	4	1	0	5	1
Settled this month*	12	3	0	15	3
Settled this year	91	7	1	99	18
Pending May 31	7	1	0	8	3
Step II					
Pending April 30	31	5	0	36	0
Settled this month**	14	3	0	17	0
Settled this year	40	6	0	46	1
Pending May 31	11	18	0	29	0
Arbitration					
Pending April 30	2	0	0	2	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending May 31	1	0	0	1	

By Departments

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Manufacturing						
Reactor - Unit	9	57	3	41	8	16
- Nonunit	0	5	0	4	0	0
Separations - Unit	4	26	3	18	3	9
- Nonunit	1	3	0	2	0	1
Metal Preparation - Unit	3	20	3	13	0	4
Plant Auxiliary Operations						
Transportation - Unit	4	9	2	4	1	5
Plant Protection - Unit	23	42	4	10	3	8
- Nonunit	0	1	0	1	0	0
Stores - Unit	0	1	0	1	0	1
Electrical Distribution - Unit	0	2	0	2	0	0
- Nonunit	1	1	0	0	0	0

*Grievances brought to Step II prior to March 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 March 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 & Public Relations						
Community - Unit	1	11	1	5	1	1
Hospital - Unit	0	1	0	1	0	0
- Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	1	6	0	5	0	0
- Nonunit	0	1	0	1	0	0
Engineering - Nonunit	1	3	0	6	0	0
Financial - Nonunit	3	3	2	2	0	0

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.	This Ye
t												
Discrimination	0	0	0	1	0	1	0	0				
Jurisdiction	5	40	2	14	0	5	0	3				
Health-Safety-San.	0	7	1	2	0	2	0	0				
Hours of Work	1	5	19	23	0	0	0	0				
Overtime Rates	3	10	2	2	0	0	0	0				
Holidays	0	1	0	0	0	0	0	0				
Sick Leave	1	4	0	0	0	1	0	0				
Seniority	0	6	1	3	0	0	0	1				
Grievance Procedure	1	2	0	0	0	0	0	0				
Wage Rates	4	13	1	3	1	2	0	1				
Miscellaneous	1	16	1	5	0	1	1	1				
Nonunit												
Health-Safety-San.	0	0	0	0	0	0	0	0	0	1	0	0
Overtime Rates	0	3	1	1	0	0	0	0	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	1	1	0	0	0	0	0	0	0	0	0	0
Wage Rates	0	1	0	0	0	0	0	0	1	1	1	1
Work Assignment	0	1	0	0	0	0	0	0	0	0	2	2
Miscellaneous	0	0	0	0	0	0	0	0	0	1	0	0

*Grievances brought to Step II prior to March 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 March 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

Construction Liaison

On May 5 all construction crafts walked off the job protesting the presence of Cisco Construction Company, a nonunion contractor. Work was resumed on May 7 when the Atomic Energy Commission informed the Building Trades Council that work would be halted on the Cisco contract.

Following the strike, Cisco filed an unfair labor practice charge with the National Labor Relations Board who conducted a hearing in Richland the week of May 17. The hearing resulted in the Board's seeking a temporary injunction from the district court. The injunction was denied but the clear implication of the court's decision was to the effect that an injunction would be issued immediately if the strike were resumed. Cisco has resumed work but the contract of an electrical subcontractor (Schultz Electric) was cancelled by the Commission. Schultz Electric had been the primary target of the unions. The National Labor Relations Board will resume hearings on the unfair labor practice charge on June 9 in Richland.

The Hanford Construction Contractors Committee has retained a San Francisco law firm to plead its case in the coming arbitration with the Teamster union. The issue is concerning isolation pay to construction bus drivers. The case is expected to be heard around June 15. In view of the Company's responsibilities in connection with construction during the period in question, it is probable that our testimony will be sought at the hearing.

Wage Rates

Reimbursement Authorization No. 224 was received from the Atomic Energy Commission for an increase from Grade 22 to Grade 24 for the classifications of Chief Operator (Reactor) and Chief Operator (Separations).

A reimbursement authorization request was submitted to the Atomic Energy Commission for the establishment of a new classification entitled, "Graphic Designer 3". This proposed classification is to apply to individuals performing model and layout work in the Graphics Unit.

The Wage Rates Unit participated in rate surveys conducted by the Seattle First National Bank and the Proctor and Gamble Defense Corporation at Amarillo, Texas.

Reimbursement Authorization No. 225 was received from the Atomic Energy Commission for the establishment of three new classifications entitled Radiation Monitor - Trainee, grade 11; Radiation Monitor, grade 18; and Radiation Monitor - Journeyman, grade 20.

UNION RELATIONS

Wage Rates (Contd.)

Plant visitations were made by a member of the Wage Rate Unit in Philadelphia, New York, Wilmington, etc., in connection with studies on engineering assistant, payroll, secretarial and stenographic classifications.

That the continuous campaign to reduce preferential rates is effective was revealed this month when a study indicated that presently only 354 employees are being paid "red circle" rates. This is a reduction from the 3,422 employees paid preferential rates following the installation of the existing wage rate plan on July 19, 1948. Because of Company-Union agreements it appears that comparatively few additional preferential rates can be eliminated by supervisory action and further reduction will be dictated by termination, retirements, etc.

Two hundred eighty-three (283) automatic increases and six (6) merit increases were processed during May. Requisitions for one hundred thirty-three (133) prospective employees and additions to the payroll for sixty (60) new employees were approved. Review for proper classification, rate, etc., was made for sixteen (16) reactivations, one hundred thirty-three (133) reclassifications, ninety-six (96) temporary reclassifications, ninety-nine (99) transfers, and one (1) transfer from the exempt roll.

Employee and Public Relations

SALARY ADMINISTRATION

1. The normal administrative work of the Section proceeded according to schedule.

2. A salary review covering all exempt employees who were not reviewed in the Professional Review in the Fall of 1953 was performed.

3. Conferences were held with all department managers relating to the organization structure of their departments on July 1, 1954. Information developed in these conferences was recorded in a set of structural organization charts. A set of these charts, along with additional information, was mailed to Paul E. Mills of the Management Consultation Services Division.

4. Work was begun on a set of functional charts to accompany the structural charts mentioned above.

5. Work continued in reconciling positions within and between departments, with the objective of assigning each exempt position to a level in the Company salary plan.

6. A further substantial number of employees formerly paid according to the Professional Salary Plan was transferred to described positions in the E.A.O. Salary Plan.

Employee and Public Relations
Technical Personnel Section

TECHNICAL RECRUITING

Against an authorization of forty technical graduates, thirty-two have been hired and five are already on the roll. These graduates are primarily in chemical and mechanical engineering, chemistry and metallurgy. In addition, ten business graduates have been hired against an authorization of twelve from the Financial Department. So far we have 37 per cent acceptance of our total offers to technical graduates and expect that this will rise beyond 40 per cent as we round out the hiring quota during the next month. Among the business graduates, acceptances represented 64 per cent of total offers even though these offers have been highly selective.

On the chance that further recruiting of recent graduates might be needed, groundwork has been laid with the placement directors of a number of colleges to aid them in referring to us qualified veterans returning from military service; also contacts have been made with supervisors of the GE Test Program who have substantial numbers of men available for placement throughout the Company during the summer.

Engineers with industrial or other process development experience have been interviewed at

California Research and Development Company
Naval Ordnance Test Station, China Lake, California
Cambridge Corporation, Denver, Colorado
White Sands Proving Ground (G.E. employees now being contacted)

Where appropriate, some of these men have also been referred to the other G.E. atomic operations and to other divisions. From all these sources, only one man has so far been hired for HAPO, but a number of others are under consideration. Also we are making every effort to promote internal transfers to meet any vacancies developing at substantial levels.

Ph.D. recruiting this spring has brought three acceptances plus one practically assured. Favorable negotiations with a number of additional candidates who have visited, or plan to visit us soon, indicate that this total will increase to 10-12 within a short time. To increase this number, we are responding to selected individual advertisements in some of the professional magazines, particularly for metallurgists. It is anticipated that the need for scientists and engineers with advanced study may increase slightly.

ROTATIONAL TRAINING PROGRAM

During May three rotational trainees were placed in departments and two new employees joined the program. Counting these changes, the total dropped from 41 to 40 trainees. We have been assured of a substantial number of placements soon after July 1. Also Selective Service losses have been carefully studied by Messrs. Curtis and McElveny, since the number of rotational trainees entering military service has increased sharply from practically zero to three or four per month at present.

Employee and Public Relations
Technical Personnel Section

EDUCATION - SCHOOL OF NUCLEAR ENGINEERING

Graduate study programs for men in industry are increasing particularly in the large cities where there are substantial concentrations of graduate engineers. The availability and improvement of our program will continue to be important in attracting and holding the most capable engineers and scientists. We are exchanging data with the managers of a number of these industrial programs to compare our methods with theirs and to see what we can learn.

At present we have some data on several programs conducted by some thirty universities in cooperation with a larger number of industrial concerns, plus a few additional programs conducted directly by large government establishments and similar in principle to our own graduate study program. It is hoped that this study will provide a basis for a report and recommendations affecting the future of our technical education program.

COUNSELING AND TRANSFERS

During May twelve technical employees resigned or entered military service. No transfers to other G.E. divisions were completed although several are being negotiated. We assisted in effecting five transfers of technical people within HAPO.

UNIVERSITY RELATIONS

As part of our continuing program with university relations, a visit was made to the University of Wisconsin during this month.

OTHER

We have cooperated in a study of the operation of W-10 library. Since this facility is very valuable to the School of Nuclear Engineering, and is essential in the eyes of the affiliated universities, we are endeavoring to find a method whereby economies may be made without curtailing the service offered to the School of Nuclear Engineering and to others.

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
MAY 1954

General

Personnel Changes

Four additions and six deletions resulted in a net decrease of two and a roll of 265.

Visits

Mr. McKinnon attended the Annual Conference of A.E.C. and Contractor Safety and Fire Protection Personnel at Oak Ridge. He also attended the annual National Fire Protection Association meeting in Washington, D. C., where he gave a talk covering the methods used here when he accepted the Second Place National Award for H.A.P.O.'s educational activities during Fire Prevention Week in 1953. He also visited Mine Safety Appliance Company, Pittsburgh, on this trip.
Dr. Sachs and Mr. Branchini, president and treasurer of the Washington State Public Health Association, attended the annual meeting of this association in Seattle.
Dr. M. A. Bigelow of the U.S. Public Health Service, visited Richland to observe the activities of the local health department.

Employee Relations

Employee attendance at 25 meetings was 202.

Industrial Medicine

One claim alleging hearing loss arising out of occupational exposure has been submitted for transmittal to the State Department of Labor and Industries. Several similar claims are expected shortly.
Studies to correlate medical findings of employee hearing loss with noise levels as indicated by industrial hygiene studies of frequency and intensity of noise in the various 100 Areas has been completed. Based on these studies, recommendations have been made to the Manufacturing Department that the wearing of personal ear protection - either plugs or muffs - be made mandatory in the locations of potential trouble to susceptible individuals.
A second lawsuit was filed in Superior Court May 4th against General Electric and the manager of Industrial Medicine claiming damages of $90,000 and costs for alleged negligence in not informing an employee of questionably abnormal shadows on a chest x-ray made during routine medical examination on March 1, 1949.
Medical examinations dropped from 988 to 935 and dispensary treatments decreased from 5289 to 4725.
The health topic was "Heart Disease."
Sickness absenteeism was 1.62% as compared with 1.66% for April, while total absenteeism was 2.52% as compared with 2.43% for April.

Safety and Fire Prevention

No major injuries were reported for the Plant Operations. There have been no loss time accidents for 96 days. This represents an accumulation of 4,358,000 man-hours. To date there have been three major injuries as compared to six for the comparable period in 1953. There were four sub-major injuries and 289 minor injuries, while the number of all injuries to date is 1539 as compared to 1657 for the comparable period last year. This represents an improvement over April.
One major injury was reported in the community operations.
There were no serious fires or explosions.

General (Continued)

Kadlec Hospital

The Community Council's Committee to consider the adequacy of the proposed legislation for disposal of Kadlec Hospital held several meetings. The manager of Health and Safety and the hospital administrator attended all of these meetings in a consultant capacity supplying factual information.

The average daily adult census decreased from 89.2 to 69.7 as compared to 82.8 a year ago. Part of this decrease was due to seasonal change, part to absence of two surgeons during the month.

The occupancy percentage for the mixed services was 66.6. Nursing hours per patient day were 4.20 for the mixed services.

Public Health

There was a further decline in communicable diseases. Whooping cough is on the increase and immunization for this disease is being stressed.

Marital difficulty was the reason for 68 of the 142 interviews by social service counselors with parents concerned about their relationships with their children.

Mosquito control work was very prominent, 1300 gallons of 5% DDT in oil being sprayed.

Costs (April)

	March	April	April Budget
Industrial Medicine (Oper.)	$45,471	$41,025	$42,801
Public Health (Oper.)	10,999	10,905	12,221
Kadlec Hospital (Net)	20,691	11,770	15,195
Hospital Expense Credits	2,712	2,057	2,500
Safety and Fire Prevention	12,392	13,178	14,812
Sub-total-Health & Safety (Oper.)	92,265	78,935	87,529
Construction Medical (Industrial and Public Health)	1,244	1,088	1,663
Total-Operations and Construction	$93,509	$80,023	$89,192

The net cost of operating the Health and Safety section before charges were assessed to various departments was $80,023, about $13,000 less than March and some $9,000 below the budget.

The improvement was due largely to increased hospital revenue of nearly $10,000 while gross operating costs were down by some $4,000.

HEALTH & SAFETY SECTION

MAY 1954

Industrial Medical Services

The total number of examinations decreased from 988 to 935. Dispensary visits also decreased from 5289 to 4725. Minor injuries decreased from 387 to 289. General Electric employees sustained one major injury and four sub-majors. Contractor employees furnished insurance by General Electric sustained no major or sub-major injuries. Industrial non-exempt nurses on the active roll were 25.

One information meeting for industrial physicians was held during the month and one scientific meeting. At the scientific meeting Dr. Norwood discussed the papers heard at the Industrial Medical Association meeting in Chicago and also discussed his visit to the Savannah River plant.

A second lawsuit was filed in Superior Court of the State of Washington May 4th against General Electric and the manager, Industrial Medical Services, claiming damages in the sum of $90,000 and costs for alleged negligence in not informing an employee of questionably abnormal findings on a chest x-ray made during routine medical examination on March 1, 1949.

One claim for hearing loss alleged as a result of noise exposure was filed on May 28th. This is the first claim filed for this cause. Four other employees signified their intention to file similar claims as they had been advised by Local 280-280A of the HAMTC in a letter assumed to have been sent to all those members having a hearing loss and who work around noise.

The Health Activities Committee met on May 20th and the health topic on "Heart Disease" was presented. Material on this subject was prepared for distribution throughout the plant. The sickness absenteeism was 1.62% as compared to 1.66% for April.

Net costs incurred during April amounted to $32,430, a decrease of nearly $4,000, or 11% from the previous month. The major portion of the reduction occurred in salaries resulting from the shorter payroll period (30 days instead of 31.)

Costs-Operations

	April	March	Increase (Decrease)
Salaries	$29,821	$32,963	$(3,142)
Continuity of Service	2,982	3,296	(314)
Laundry	264	256	8
Utilities, Transportation, Maintenance	3,952	4,098	(146)
Supplies and Other	5,389	6,168	(779)
Total Gross Costs	42,408	46,781	(4,373)
Less: Revenue	1,383	1,310	73
Expense Credits	8,595	9,197	(602)
Net Cost of Operation	$32,430	$36,274	$(3,844)

At the conclusion of ten months' operation, net costs are approximately $31,000, or 8% less than budgeted. The underrun is primarily attributable to the greater than anticipated charges to other departments for services rendered.

1211929

HEALTH & SAFETY SECTION

MAY 1954

Industrial Medical Services (Continued)	April	May	Year to Date
Physical Examinations			
Operations			
Pre-employment	65	73	325
Rehire	22	27	120
Annual	306	161	1670
Interim	157	211	403
A.E.C.	28	29	148
Re-examination and recheck	183	204	1010
Termination	98	70	337
Sub-total	859	775	4013
Contractors			
Annual	0	20	64
Pre-employment	74	84	335
Recheck	37	38	157
Termination and Transfer	18	18	87
Sub-total	129	160	643
Total Physical Examinations	988	935	4656
Laboratory Examinations			
Clinical Laboratory			
Government	103	114	626
Pre-employment, Termination, Transfer	1457	1623	6772
Annual	1666	902	9080
Recheck (Area)	791	1077	2145
First Aid	19	2	63
Clinic	488	378	2037
Hospital	5225	3792	22659
Total	9749	7888	43382
X-Ray			
Government	14	13	79
Pre-employment, Termination, Transfer	151	219	968
Annual	492	414	2274
First Aid	100	75	467
Clinic	199	205	1038
Hospital	362	277	1558
Public Health	7	6	46
Total	1325	1209	6430
Electrocardiographs			
Industrial	59	64	370
Clinic	1	2	5
Hospital	40	26	178
Total	100	92	553

HEALTH & SAFETY SECTION

MAY 1954

Industrial Medical Services (Continued)	April	May	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	434	324	1727
Occupational Case Retreatments	1594	1384	6474
Non-occupational Treatments	2802	2658	13552
Sub-total	4830	4366	21753
Construction			
New Occupational Cases	94	78	317
Occupational Case Retreatments	239	242	807
Non-occupational Treatments	94	39	242
Sub-total	427	359	1366
Facility Operators	32	0	149
Total First Aid Treatments	5289	4725	23268
Major Injuries			
General Electric	0	1	4
Contractors	0	0	0
Total	0	1	4
Sub-Major Injuries			
General Electric	3	4	13
Contractors	0	0	1
Total	3	4	14
Absenteeism Investigation			
Calls Made	7	1	28
Employee Personal Illness	3	1	20
No. Absent due to illness in family	0	0	1
No. not at home when call was made	4	0	7

Kadlec Hospital

The average daily adult census decreased from 89.2 to 69.7 as compared to 82.8 a year ago. This represents an occupancy percentage of 63.9 broken down as follows: Mixed Service (Medical, Surgical and Pediatrics) 66.6; Obstetrical Service 54.3. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	33	77
Obstetrical Service	5	16
Total Adult	46	89

The average daily newborn census decreased from 12.0 to 8.9 as compared to 10.1 a year ago.

Nursing hours per patient per day

Medical, Surgical, Pediatrics	4.20
Obstetrical	4.27
Newborn	4.03

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of April was 1.86. When newborn infants are included, the ratio is 1.64.

The net expense for the operation of Kadlec Hospital for April was $11,770 as compared to $20,691 for March. Summary is as follows:

Kadlec Hospital net expense $11,770
This is a decrease of $8,921 due almost entirely to increased revenue from a high patient census. Gross costs did not change appreciably ($26 increase); revenue increased $9,602 and expense credits decreased $655.

Kadlec Hospital's annual Open House in observation of National Hospital Week was successfully completed on May 11th. Many Hanford Works people toured the hospital and became better acquainted with the hospital facilities which are available to them. As was done last year, Kadlec Hospital cooperated with the other Tri-City hospitals in jointly publicizing items of common interest.

The sharp drop in patient census reported above is due primarily to the seasonal decline usually experienced and the fact that two surgeons have done very little work during the month, one being out of town and the other making preparations for departure on a leave of absence.

Following is a summary of employee relations meetings held in the Health and Safety Section during May:

	Meetings	Attendance
Hospital	12	106
Industrial Medicine	4	16
Public Health	5	50
Safety & Fire Prevention	2	20
General	2	10
Total	25	202

Hospital Unit (Continued)	April	May	Year to Date
Kadlec Hospital			
Average Daily Adult Census	89.2	69.7	80.8
Medical	21.3	19.6	22.5
Surgical	42.5	26.8	34.0
Pediatrics	12.8	11.9	12.8
Mixed	76.6	58.3	69.3
Obstetrical	12.6	11.4	11.5
Average Daily Newborn Census	12.0	8.9	10.9
Maximum Daily Census:			
Mixed Services	99	77	99
Obstetrical	19	16	19
Total Adult Census	116	89	116
Minimum Daily Census:			
Mixed Services	53	33	33
Obstetrical Service	4	5	4
Total Adult Census	65	46	46
Admissions: Adults	674	504	2832
Discharges: Adults	669	542	2848
Medical	156	127	740
Surgical	321	239	1246
Pediatrics	100	94	448
Mixed	577	460	2434
Obstetrical	92	82	414
Newborn	85	72	373
Patient Days: Adult	2677	2162	12191
Medical	640	607	3395
Surgical	1275	832	5131
Pediatrics	384	368	1935
Mixed	2299	1807	10461
Obstetrical	378	355	1730
Newborn	359	277	1653
Average Length of Stay: Adults	4.0	4.0	4.3
Medical	4.1	4.8	4.6
Surgical	4.0	3.5	4.1
Pediatrics	3.8	3.9	4.3
Mixed	4.0	3.9	4.3
Obstetrical	4.1	4.3	4.1
Newborn	4.2	3.8	4.4
Occupancy Percentage: Adults	81.8	63.9	74.1
Medical	57.6	53.0	60.8
Surgical	132.8	83.8	106.3
Pediatrics	67.4	62.6	67.4
Mixed	87.0	66.3	78.8
Obstetrical	60.0	54.3	50.0
Newborn	46.2	34.2	41.9

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

HEALTH & SAFETY SECTION

MAY 1954

ɔspital Unit (Continued)	April	May	Year to Date
Kadlec Hospital (Continued)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.18	4.20	
Obstetrics	4.84	4.27	
Newborn	3.01	4.03	
Avg. No. Employees per Patient (excluding newborn)	1.86		
Operations: Major	105	65	419
Minor	125	64	474
E.E.N.T.	98	63	356
Dental	1	0	10
Births: Live	77	75	369
Still	2	0	4
Deaths	4	6	27
Hospital Net Death Rate	.40%	.49%	.43%
ⁿet Autopsy Rate	75.0	0	44.4
.scharged against advice	1	2	6
One Day Cases	207	152	769
Admission Sources:			
Richland	72.7	72.8	73.6
North Richland	12.9	13.1	12.7
Other	14.4	14.1	13.7
Admissions by Employment:			
General Electric	68.7	67.5	69.2
Government	3.6	2.9	3.1
Facility	3.2	6.8	4.8
Contractors	18.2	16.8	17.7
Schools	2.1	2.0	1.2
Others	4.2	4.0	4.0
Hospital Outpatients Treated-F.A.	608	473	2690
Recovery Bed Patients-F.A.	0	1	71
Physical Therapy Treatments			
Clinic	354	314	1694
Hospital	122	58	496
Industrial: Plant	184	174	926
Total	660	546	3116
Pharmacy			
No. of Prescriptions Filled	2834	2558	32877
No. of Store Orders Filled	546	492	2562

12 1934

HEALTH & SAFETY SECTION

MAY 1954

Hospital Unit (Continued)	April	May	Year to Date
Kadlec Hospital (Continued)			
Patient Meals			
Regulars	4207	3383	18736
Children under 8	379	479	2205
Specials	1065	1032	5942
Softs	1158	738	4717
Tonsils	185	124	695
Liquids	220	154	947
Surgical Liquids	89	86	417
Total	7303	5996	33659
Cafeteria Meals			
Noon	1804	1746	9325
Night	320	338	1542
Total	2124	2084	10867

HEALTH & SAFETY SECTION

MAY 1954

Public Health Unit

A further decline in the number of communicable diseases reported was noted, due primarily to the reduction in the incidence of red measles. However, it was noted that whooping cough was on the increase. Immunizations and booster shots are being stressed and the physicians are being notified in this rise in incidence as a control measure.

In the level of communicable disease cases, the home nursing cases were reduced about 15%. Matters concerning maternal and child health were stressed. A tuberculosis clinic was held, which was conducted by Dr. A. R. Allen of the Central Washington Tuberculosis Hospital. A hearing clinic was held for children who were screened for hearing defects in public schools.

A visit was made to the unit by Dr. M. A. Bigelow of the United States Public Health Service on the basis of observing the activities of the local health department. Miss Julia Anderson, Field Consultant, University of Washington School of Nursing, visited the unit in regard to field training opportunities for student nurses. Miss Pearl Fink and Mr. Denzel Petersen visited the department in regard to local health administrative details, namely mark sense reporting.

The Health Officer and Health Educator attended a meeting of the Washington State Public Health Association in Seattle. The Health Officer, as president of the Washington State Public Health Association, afforded greetings and presented a talk at a symposium on public health problems and programs. The Health Officer was re-elected to the regional board of Western Branch of the American Public Health Association for a two-year period.

The Health Educator is elected treasurer to the Washington State Public Health Association. He is also president of the Benton-Franklin County Tuberculosis Society.

During May the Social Service counselors had 142 interviews with parents concerned about their relationships with their children. Marital difficulty was the focus of 68 interviews.

In the area of direct work with personality problems, children were seen 52 times, adolescents 38 times and adults 34 times.

There were nine other interviews during the month covering areas of physical illness, unmarried parenthood, mental illness and economic problems.

In May 1300 gallons of 5% DDT in oil was sprayed by mosquito control crew. Areas chiefly sprayed were along river banks and swampy areas. Considerable time was utilized cleaning out drainage ditches throughout the area. Fogging machine has not been utilized as the prevalence of adult mosquitoes has not warranted its use.

Routine inspection of food handling establishments were satisfactory. In accordance with previous years, bakeries have discontinued delivery of cream pies for the summer months.

Public Health Unit (Continued)

Bacteriological results of water and sewage samples were satisfactory.

Malathon was sprayed on animal pens for control of flies in the 100F Area. Results were very satisfactory. It was recommended that areas be sprayed every two to three weeks during summer months.

Progress was made regarding new well and septic tank for Burlin Camp.

HEALTH & SAFETY SECTION

MAY 1954

Public Health (Continued)	April	May	Year to Date
Education			
Pamphlets distributed	21,109	10,999	65,165
News Releases	28	8	67
Staff Meetings	2	1	7
Classes	20	21	108
Attendance	707	82	2954
Lectures and Talks	10	6	39
Attendance	359	110	1945
Films Shown	27	23	76
Attendance	1279	1070	3147
Community Conferences & Meetings	37	26	148
Radio Broadcasts	9	8	49
Immunizations			
Diphtheria	2	9	19
Diphtheria Booster	8	3	14
Tetanus	2	9	20
Tetanus Booster	8	3	13
Pertussis	2	9	18
Pertussis Booster	8	3	13
Smallpox	7	5	24
Smallpox Revaccination	292	4	381
Tuberculin Test	3	1	9
Immune Globulin	123	40	694
Other	0	0	4
Social Service			
Cases carried over	94	92	451
Cases admitted	15	20	94
Cases closed	17	15	83
Remaining case load	92	97	462
Activities:			
Home Visits	7	12	42
Office Interviews	361	341	1587
Conferences	59	42	257
Meetings	8	6	37
Sanitation			
Inspections made	146	123	668
Conferences held	24	11	88
Bacteriological Laboratory			
Treated Water Samples	196	173	919
Milk Samples (Inc. cream & ice cream)	54	36	205
Other bacteriological tests	697	567	3043
Total	947	776	4167

HEALTH & SAFETY SECTION

MAY 1954

Public Health (Continued)	April	May	Year to Date
Communicable Diseases			
Chickenpox	45	58	221
German Measles	7	3	31
Impetigo	0	0	3
Influenza (U.R.I.)	1	2	4
Infectious Mononucleosis	1	0	1
Infectious Hepatitis	3	1	4
Measles	175	78	1,338
Mumps	4	5	18
Pinkeye	0	4	6
Ringworm	0	0	6
Roseola	0	2	5
Scabies	0	0	1
Scarlet Fever	5	6	54
Streptococcal Infections-Throat	0	0	3
Tuberculosis	0	0	1
Whooping Cough	11	23	44
Total	252	182	1,740
Total No. Nursing Field Visits	665	758	3,813
Total No. Nursing Office Visits	161	111	607

COMMUNITY OPERATIONS SECTION

ORGANIZATION & PERSONNEL

MAY 1954

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
ADMINISTRATION	1	1	1	1
ELECTRICAL	5	16	5	15
PUBLIC WORKS	10	59	10	67
RECREATION & CIVIC AFFAIRS	3	2 1/2	3	2 1/2
LIBRARY	4	8	4	8
POLICE	17	32	17	33
FIRE	67	0	67	0
ENGINEERING	6	3	6	3
	113	121 1/2	113	129 1/2

COMMUNITY OPERATIONS SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
MAY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	5	16
Transfers In	0	0
Transfers Out	0	1
Terminations	0	0
Total End of Month	5	15

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	7
Anchors set and guys installed	1
Street lights repaired and steel mast arms installed	6
Street lights relamped - Mercury Vapor	1
Street lights relamped - 6000L and 4000L, 1100 Area	78
Street lights relamped - 6000L and 4000L, 700 Area	3
Flood lights relamped, 1100 Area	0
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	1
Primary line footage added	200
Primary line footage removed	0
Transformer KVA added	120
Transformer KVA removed	15
Net transformer KVA installed	105
New services installed - residential	0
New services installed - commercial	9
Temporary services installed or removed	4
Scheduled outages - primary	3
Scheduled outages - secondary	3
Unscheduled outages - primary	1
Unscheduled outages - secondary	0
Standby and escort	1
High voltage tree trimming	10
Low voltage tree trimming	6
Services and meters removed	29

TRAFFIC SIGNALS

Relamping	1
Operational failures	1
Installations	0
Removals	0

RICHLAND ELECTRICAL UNIT

Routine maintenance checks	42
Routine check R.R. signal at Van Giesen	1
Total signals in operation - automatic	17
Total signals in operation - manual	3
Total signals in operation - flasher	1

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	16
Electrical motors checked and serviced - water	37
Electrical motors checked and serviced - sewage	52

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	4
Outside circuit checks	4
Inside faults repaired	0
Outside faults repaired	3
New circuits placed in operation	0
New boxes placed in operation	0

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	4
Main feeder and tie breaker checks - BB1S2	4
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	12

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Radio interference checks	2
Voltage and load checks	3
Meters tested - customers' requests	9
New meters shop tested	17
Faulty meters replaced	5
Damaged meters and covers	6
Residential read-ins	262
Residential read-outs	176
Residential disconnects	0
Residential reconnects	0
Meters resealed	4
Meters changed out due to excessive load (Residential)	1

Note: Consumption and revenue reports, under IBM operation, are not available until 18th of following month.

Consumption and revenue:

	No. of Meters	KWH	Revenue
Schedule 1 - Residential	7045 (Est.)	6,500,000	$47,000.00
Schedule 2 - Commercial	344		

RICHLAND ELECTRICAL UNIT

	No. of Meters	KWH	Revenue
Class 1 - (In Lease)		670,514	$ 5,866.01
Class 2 - (Metered Basis)		731,151	8,503.56
Class 3 - (Plant Adm.)		1,391,706	9,522.27
	Total	9,293,371	$70,891.84

COMMENTS

Removed services and meters from eight houses to be excessed and sold.

Installed three permanent services and three temporary services.

Installed cross walk sign for Police Department, mercury vapor to Library north parking lot for Library patrons, a sodium vapor light at danger point on Bypass Highway, and completed eight mercury vapor installations on GW Way.

Re-routed and increased capacity of primary line at Stevens and Long to meet increased demands of new additions being installed to Catholic Church and School properties.

Extended primary line and installed 37.5 kva transformer to supply new Baptist Church being built at Thayer and Duportail.

Increased transformer station to Light Industrial Area 25 kva by replacing existing 75 kva lighting transformer with 100 kva transformer to meet increased loads.

Replaced 15 kva transformer supplying # 13 and 14 warehouses with 50 kva transformer to supply increased demand.

Installed 7.5 kva transformer and extended secondaries two spans to supply School Farm Shop with power under the irrigation schedule.

Replaced three rotted street light poles: Smith and Jewett, Snow and Gratiot, and Winslow and Gratiot.
Replaced one rotted primary pole at Thayer and Duportail.
Replaced two rotted primary poles at Adams and GW Way in rear.

Connected 30 TV amplifier stations and commenced billing on same. There are now 81 stations which are connected and being billed for consumption.

Replaced 56 defective street light jumper wires to lamps with stranded insulated wire to prevent broken wires from wind and vibration.

Replaced 21 rotted and fallen guy and anchor barricades which serve as protection from vehicles in #2 Salvage Yard in 3000 Area.

Rearranged service to clear trees across yard at 1941 Harris as requested by tenant.

RICHLAND ELECTRICAL UNIT

Overhauled lights to remove bad switch connections at Softball Park, and segregate concession stand circuit from field lights to permit separate operation as requested by Parks and Recreation.

Completed final repairs to traffic signal cable damaged by sewer contractor at Swift and Goethals.

Completed metering installation to Sewage Lift Station #1, rear of Central Fire Station.

Disconnected three motors at Sewer Treatment Plant, on Digester so Machinist could pull pumps. Replaced two bearings to 25 HP motor on #2 circulator pump at Sewer Treatment Plant. Completed replacement of damaged and rusted conduit and wiring to #1 plant clarifiers light circuits and digester at Sewer Treatment Plant.

Completed overhaul to Oil Circuit Breakers and Protectors that control all street lighting stations in Richland. This is an annual preventive maintenance measure that is a means of preventing loss of lighting and consequent call-in time.

Wired disconnect switch, light and receptacle in chlorine shack at foot of Lee Boulevard, and connected service to same for swimming pool.

Installed .25 mf capacitors to all GE traffic controllers, to cut down on arcing of contactors in flasher units, and prevent radio interference.

Installed meter and connected service to Farm Shop irrigation pump.

UNUSUAL INCIDENT:

May 6, 1954, 115 kv power off in Richland from 6:36 A.M. to 7:13 A.M. due to conductor splice pulling out at Spengler and Stevens Drive. 115 kv circuit breaker opened at Midway due to resulting ground fault indication. Resulting stray and inductive currents caused fuse failure on fire alarm circuit along Stevens Drive. Rapid service restoration was aided by prompt switching by Community and Plant Electrical Forces, and the complete switching equipment on the Richland Electrical System.

There were six planned outages during month to handle circuits in connection with work in progress.

COMMUNITY OPERATIONS SECTION
PUBLIC WORKS UNIT
MONTHLY REPORT
MAY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	10	59
Transfers Out	--	2
Transfers In	--	5
New Employees	--	3
Reactivated	--	2
Terminations	--	--
Total End of Month	10	67

SANITATION

A total of 1231 tons of garbage and trash was collected and disposed of during May. May 31 was observed as a holiday and no collections were made on this day. Residential routes normally due on Monday were collected the following day and a commercial crew was worked on 5-29-54 to eliminate the possibility of a sanitation problem over the three day week end.

ROADS AND STREETS

All preparatory work in connection with the 1954 "Seal-Coat" program was completed this month. This work included blading and stabilizing of shoulders, patching of holes, correction of drainage problems, and cleaning of surface. The application of hot oil and rock is scheduled to begin on 6-2-54. The streets included in this year's program amount to 7 miles and are as follow:

Goethals	-	Van Giesen to Stevens
Roberdeau	-	Long to Thayer
Putnam	-	Wright to Thayer
Potter	-	Putnam to Symons
Swift	-	Sanford to Stevens
Long	-	Thayer to Stevens
Thayer	-	Swift to Sanford
Thayer	-	Sanford to By-Pass 8' shoulder on east side only
Mansfield	-	Stevens to Columbia Playfield Parking Lot

121 [illegible] 5

Duportail	-	Thayer to Smith
Lee	-	Thayer to Stevens
Gillespie	-	Lee to George Washington Way
Goethals	-	Gillespie to Endress
Goethals	-	Swift to Williams 8' shoulder on east side only
Hunt	-	George Washington Way to Davidson
Haupt	-	George Washington Way to Thomas
Parking Lot	-	Community House
Parking Lot	-	Building W-20

The storm sewer line at Van Giesen and Sanford was stopped up by entrance of tree roots and it was necessary to use a power driven root cutter to repair the stoppage.

The shoulder on the east side of Goethals, from Swift to Williams, was widened six feet, requiring 180 cubic yards of pit run gravel and 96 cubic yards of 3/4" minus material. This new shoulder will protect the edge of old pavement from raveling and will assist in traffic movement through this area.

Street sweeping has been curtailed since the early part of May due to mechanical failure of the Elgin street sweeper. Repair parts are on order.

Routine seasonal repair and maintenance of streets, street signs, drainage systems, municipal sidewalks and parking lots was continued.

PARKS AND PUBLIC GROUNDS

Week end janitor service at Riverside Park was commenced on 5-29-54 and will continue into the summer months. The wading pool at Riverside Park is available for use and has been filled for use on the days when weather is warm enough for this type of recreation. The vacuum type chlorinator formerly used for chlorinating the wading pool water was needed for use in the irrigation system and replacement was made by installation of a pump type hypo-chlorinator.

Irrigation of Riverside Park, Columbia Playfield, and the dike was assigned to the mid-night shift on 5-31-54. Other areas will be assigned to the mid-night shift as soon as employees are received.

A large pile of trash which had accumulated over many years near the intersection of Catskill and Rainier Streets, and amounted to about 60 cubic yards, was loaded and hauled to the old dump site on Saint Road.

For sometime, the small rotary pop-up sprinklers installed in park areas have created a maintenance problem and an irrigation problem due to excessive wear on moving parts caused by sand in the domestic water. A decision has been reached that it is

impractical to maintain this type of pop-up sprinkler under the conditions prevalent here and a study is now in process to determine the most economical type of sprinkler with which to replace the unsatisfactory type presently installed.

Irrigation and mowing of all assigned lawn grass areas has been in process during the month. Again this year, we are handicapped in lawn maintenance program work due to seasonal employees not being procured for us on the dates requested.

Routine maintenance of all parks properties, shelterbelts, and public areas was continued as necessary.

DOMESTIC WATER

The rate of water percolation at the 3000 Area recharge basin diminished considerably during the early part of the month. As a result, the underground water table dropped quite rapidly and it became necessary to cut back on the well pumps in this area to prevent excessive draw-down and pumping of air. In an effort to increase the rate of percolation, water to the north half of the recharge basin was shut down on 5-14-54 and as soon as the basin had dried, approximately 6" of silt and sand was removed from the surface of this basin. Water was turned back into the north half on 5-30-54 and the underground water table has recovered somewhat since that date.

At the same time that water was turned back into the north half of the basin, water was shut down to the south half of the basin and as soon as this area has dried sufficiently, the accumulated silt will be removed from the surface.

On 5-25-54 and 5-26-54, pumping tests were run on wells 3000 H, J, K, and L, and production at these wells was far below the original test pumping. As a result of these pump tests, a request has been sent to the Commission that the services of a well specialist be procured in an attempt to develop these wells so that their production may more closely approach the capacity of installed pumps and original test pumping.

The bearings and shafting at well 3000 D were damaged due to lack of water lubrication when the water table dropped at this well. The pump has been replaced and is available for use when there is sufficient water in the casing.

The bottom turbine bearing at well 3000 L became clogged with sand and damaged the turbine bearing and shafting. Parts for this well are now on emergency order and the well will not be available for service until these parts arrive.

Community Operations
Public Works Unit

On 5-26-54 an orifice in the well discharge header in the 3000 area which had originally been installed in 1949 for use in connection with rate of chlorination feed and which is no longer necessary, was removed from the line. This was done to eliminate any unnecessary restriction in the well header.

DOMESTIC WATER

	Well Production Million Gallons	Average Daily Production	Total Consumption Million Gallons	Av. Daily Consump.
Richland	149.9900	4.8384	457.6691	14.7635
North Richland	291.2250	9.3944	47.9144	1.5456
Columbia Field	110.6806	3.5703		
300 Area			46.5146	1.5005
TOTAL	551.8956	17.8031	552.0981	17.8096

Maximum Daily Consumption was 25,461,400 gallons on May 17, 1954.

SEWERAGE SYSTEM

Approximately 45,000 gallons of sludge were pumped to the drying beds during May. The three sludge mixers in the primary digestor were removed for overhaul and it was found that lubrication tubes to the bottom bearing which is under the sludge level had broken off in two of the mixers with the result that the bearing required replacement. The parts are on order and break-up of the sludge blanket during the period the mixers are not in service is being accomplished by periodic raising and lowering of the level of sludge in the digestor. Replacement of the lubrication line in these mixers is being done in such a manner that it will be less likely that these lines will again break while in service.

The effluent from the #1 Treatment Plant has been pumped over the dike by the Corps of Engineers' pumping installation at the treatment plant since 5-19-54 due to the high level of the river water.

Routine maintenance and operation of the sewage collection system, lift station, and treatment plants were continued.

SEWAGE

	Total Flow Million Gallons	Average Daily Flow Million Gallons
Plant No. 1	31.950	1.031
Plant No. 2	69.201	2.232
TOTAL	101.151	3.263

Community Operations
Public Works Unit

IRRIGATION SYSTEM

A rupture occurred in the wooden line from the pen stock to North Richland on May 17, 1954. The line was out of service two days while repairs were made.

A spill flume on the canal just west of the open air theatre on Spengler Road washed out on 5-26-54 and repairs are being made by construction and installation of a wooden plank flume.

All irrigation pump stations are in service with the exception of some isolated lines which are being repaired of leaks.

1211949

COMMUNITY OPERATIONS SECTION
RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
MAY 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	2-1/2
New Hires	0	1
Terminations	0	0
Transfers - In	0	0
Transfers - Out	0	1
End of Month	3	2-1/2

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of May 31, 1954:

Administration	7
Principals and Supervisors	14
Clerical	25
Teachers	304
Health Audiometer	0
Cooks	43
Bus Drivers	1
Maintenance	21
Operations	46
	461

CLUBS AND ORGANIZATIONS

As of May 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 the 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 Organizations		18
Churches and Church Organizations		27
Civic Organizations		7
Schools		10
Fraternal Organizations		25
Political Organizations		7
Recreation and Social Clubs -	Alumni	3
	Arts, Crafts and Hobby	7
	Dramatics	1
	Dance	3
	Nature & Outing	7
	Music	8
	Social	13
	Sports	19
Veteran and Military Organizations		14
Welfare Groups		10
Youth - Boy Scouts		20
Girl Scouts		49
Campfire Girls		36
Miscellaneous		19
		303

RECREATION

The regular meeting of the Parks and Recreation Board was held on May 7, 1954. The Board recommended that the Rose Society be allowed to re-locate and maintain a rose garden at Riverside Park, or other desirable parkland with the final design, space, location, and level of maintenance, approved by the Community Operations Section.

The motion was passed that the Stevens Playground Development Plan was acceptable to the Board, and that the Lutheran Church should be required to follow same: that the relocation of equipment should be accomplished by June 30, 1954; that trees should be planted in the fall, not later then November 30, 1954; and that trees should be of a minimum height of ten (10) to twelve (12) feet: and, lastly, that the former action taken by the Board on November 16, 1953, requiring that a protective fence be erected by the Lutheran Church be waived.

The next regular meeting of the Board is scheduled for June 2, 1954

On May 24, 1954, the wading pool at Riverside Park was made ready for the 1954 season and arrangements made to have it cleaned and re-filled daily, Monday thru Sunday until the completion of the summer season.

Attendance Statistics - May 1954

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
A. Community House					
I. Rec. Unit Supervised Programs					
Games Room Activities	25	1 534	353		1 887
Jr. Softball League	1	1	20		21
Play-For-Fun League	1		11		11
II. Affiliated Programs					
Hi-Spot Club (Teen Age)	9	2 803	35		2 838
Rec-A-Teers	3		193		193
Fencing	3		13		13
Jr. Stamp Club	1	7	2		9
Int'l. Folk Dancers	7	12	90		102
G.E. Women's Club	1		11		11
Rich.Rod & Gun Club	1	30	80		110
Y.W.C.A. Supper Club	2		67		67
Rich. Softball Assn.	1		18		18
Jr. Sportsmen Club	3	49	12		61
Allied Arts Assn.	3		48		48
Jr. Philharmonic	2	76	32		108
Jr. Baseball League	1		36		36
III. Rec. Unit Special Events					
None					
IV. Non-Unit Special Events					
None					
V. Other Comm. House Bookings	28	169	856		1 025
Sub-Totals	92	4 681	1 877		6 558
B. Parks and Playgrounds					
I. Rec. Unit Supervised Programs					
Juvenile Fishing	31	3 051	442		3 493
General Play-Riverside	31	3 000	2 000		5 000
Play-For-Fun League	1	32	8		40
General Play-Columbia	31	450	1 100		1 550
Triple-O-League	3		288	344	632
II. Affiliated Programs					
Jr. Baseball League	3	90		180	270
Little League (Jeff.)	16	480	128	3 175	3 783
Jr. Softball Clinic	2	151	28		179
Rich. Softball Assn.	15		900	1 434	2 334

RECREATION AND CIVIC AFFAIRS UNIT — MAY, 1954

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
III. Rec. Unit Special Events					
Marble Tournament	1	28	3	12	43
IV. Non-Unit Special Events					
School Boy Patrol Picnic	1	395	15		410
Little League Jamboree	1	180	10	350	540
Campfire Girls Camporee	2	325	70		395
Rich. Softball Jamboree	1		150	250	400
V. Baseball & Softball Bookings					
All Fields	251	3 660	832		4 492
Lakeshore League	1		30	150	180
VI. Estimated Use of Non-Supervised Playgrounds					
Columbia Playfield - School Use	20	7 500	60		7 560
Neighborhood Playgrounds	31	5 000	1 500	____	6 500
Sub-Totals	441	24 342	7 564	5 895	37 801

SUMMARY OF STATISTICS

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
Community House	92	4 681	1 877	-0-	6 558
Parks & Playgrounds	441	24 342	7 564	5 895	37 801
Total May Attendance	533	29 023	9 441	5 895	44 359

Grand Total for May 44,359
Cal. Year Total To Date 112,018

COMMUNITY OPERATIONS SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
May 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	15,435	
Magazines	493	
Pamphlets	64	
Records	952	
Inter-Library Loans	31	
Grand Total	16,975	

Current Book Stock

Books added this month		694 (483-Adult; 211-Juv.)
Books withdrawn this month		1(J)
Grand Total	29,961	

Registration

Adult	121	
Juvenile	98	
Total	219	
Total Registered Borrowers	16,194	
Children's Story Hour Attendance	244	
Meetings in North Hall	21	
Library Group Visits		72 (Spalding School-5th-6th Grades-42;John Ball 2nd Grade-30

COMMUNITY OPERATIONS SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
MAY 1954

ORGANIZATION	Exempt	Non-Exempt
Employees - Beginning of Month	17	32
Transfers In	0	0
Transfers Out	0	0
New Hires	0	1
Terminations	0	0
Total - End of Month	17	33

GENERAL

The third annual Teen-age Road-E-O was held on Sunday, May 2, on Wellsian Way. The event is sponsored by the Junior Chamber of Commerce, and the annual trophy is purchased and awarded by the Police Athletic League. Wellsian Way was blocked off for the event and an officer was assigned to regulate traffic and lend assistance to the sponsor of the event.

The annual School Boy Patrol picnic, sponsored by the Police Athletic League, was held on Thursday, May 27. Approximately 325 boys were in attendance at this all day affair. The children were treated to a motion picture show, after which they were served hot dogs, cold drinks, and ice cream furnished by the Police Athletic League. During the afternoon, awards, trophies, and medals, also furnished by the Police Athletic League, were presented to outstanding boys from each school as well as to the outstanding school during the year. Ladies of the American Legion Auxiliary served.

During the first week of May, the Police Department cooperated with the Carnation Milk Company and assisted their safety committee in conducting reaction tests for the Carnation Milk truck drivers. These tests were conducted on Wellsian Way, which was blocked off as a safety precaution. The purpose of the tests is to improve driving habits of Carnation drivers.

Chief H. W. Strock and Capt. C. F. Klepper attended the annual conferences of the Washington Chiefs of Police and the Washington Police Officers Association, respectively, held in Yakima on June 28 and 29.

One group of Boy Scouts were escorted on a tour of Police Headquarters during the month of May.

During the month of May, the Police Department was assigned three new vehicles as replacements.

The call letters for our station WGMB 12 were changed on May 5 to radio station KKE station 12. This is a temporary change until new radio equipment is obtained, at which time we will be assigned to the same frequency now used by the Fire Department.

TRAFFIC	1954 April	1954 May	1953 April	1953 May	1954 Total To Date	1953 Total Same Period
ortable accidents	20	20	30	18	111	110
operty damage accidents	19	16	26	12	96	95
Injury accidents	1	4	4	6	15	14
Total persons injured	1	4	4	12	15	21
Fatal accidents	0	0	0	0	0	1
Accidents-Daylight hours	10	16	17	14	73	69
Darkness	10	4	13	4	38	41
Accidents-Business district	7	5	15	6	30	44
Residential "	11	11	13	7	64	47
Other "	2	4	2	5	17	19
Accidents investigated	14	13	22	13	63	71
Criminal complaints filed	14	9	19	12	43	57
Violations contributing to accidents:						
Negligent driving	6	2	8	3	21	18
Fail. to yield r.o.w.	4	8	8	5	26	37
Following too closely	5	2	3	2	22	17
Drunk driving	1	1	1	0	2	1
Pedestrian violation	0	3	1	1	3	3
Inattention to driving	0	0	1	0	0	1
Reckless driving	1	0	1	1	3	4
Speeding	0	0	0	0	1	2
Unsafe speed	0	1	1	2	20	3
Improper backing	1	2	0	3	6	9
Disregarding stop sign	0	0	0	1	0	4
Hit and run	0	0	0	0	0	1
Improper passing	0	0	0	0	0	2
Improper turn	0	0	0	0	1	0
Failure to signal	1	0	0	0	1	0
Wide right turn	1	0	0	0	1	0
Wrong side of road	0	0	0	0	0	0
Defective equipment	0	0	0	0	0	0
Bicycle violation	0	1	0	0	2	0
North Richland:						
Reportable accidents	10	8	9	8	42	43
Property damage accidents	8	5	8	4	34	35
Injury accidents	2	3	1	4	8	8

Richland	1954 April	1954 May	1954 Ave.Per Accident April	1954 Ave.Per Accident May	1953 Ave.Per Accident April	1953 Ave.Per Accident May
Accident property damage	$5816.00	$3520.00	$306.10	$176.00	$174.64	$345.98

TRAINING

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction was as follows:

38 Caliber Revolver	½ Hour	Qualifications on the Army-L Course as follows:					
Total number of men reporting at the range	20	Sharpshooter	4	20%	Expert	2	10%
Number of men fired over the Army-L Course	20	Marksman	11	55%	Unqualified	3	15%

ACTIVITIES AND SERVICES	April		May	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	4	8	6	6
Bicycles impounded	0	1	7	0
Bicycle violations	0	0	0	0
Bicycles registered	560	0	48	0
Children lost or found	23	2	17	2
Complaints investigated (no enforcement action)	72	12	44	11
Deaths reported	2	0	0	0
Dog, cat, loose stock complaints	6	1	7	0
Dogs, cats, reported lost or found	9	0	10	1
Doors, windows found open in facilities	34	6	46	9
Emergency messages delivered	29	101	13	102
Fires investigated	9	2	9	2
Guns registered	2	0	3	0
Law enforcement agencies assisted	10	1	5	0
Letters of inquiry	85	0	71	0
Miscellaneous escorts	8	4	7	3
Persons injured by dogs	0	1	3	0
Plant departments assisted	14	0	15	2
Prisoners processed through Jail	17	17	19*	18
Private individuals assisted	11	1	19	2
Property lost or found	24	0	20	5
Records inquiries	120	0	105	0
Reports processed through Records	235	104	223	185
Street lights out reported to Electrical	130	30	93	27
Traffic safety meetings (May attendance 770)	32	0	10	0
Total	1436	291	800	375

*Two of these prisoners handled for Security Patrol
*Two of these prisoners handled for Washington State Patrol

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
MAY 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	-	-	-	-	-	-	-
6. Larceny Over $50.00	2	1	-	-	1	-	1**	-
Under $50.00	13	9	-	-	-	2	1	1
7. Auto Theft	-	-	-	-	-	-	-	-
TOTAL PART I CASES	16	10	-	-	1	2	2	1
PART II								
8. Other Assaults	-	2	-	-	-	-	-	2
9. Forgery & Counterfeit	-	-	-	-	-	-	1**	-
10. Embezzlement & Fraud	6	1	-	-	-	1	6	-
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons: Carry: Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	2	-	-	-	1	-	-	-
15. Offenses Ag.Fam.&Child	1	1	-	-	1	1	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	6	10	-	-	-	-	6	10
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	1	-	-	-	-	-	1	-
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intoxicated	4	-	-	-	-	-	4	-
23. Viol. Rd. & Dr. Laws:								
Fail. to Stop & Identify	2	-	-	-	1	-	1	-
Speeding	15	7	-	-	-	-	15	7
Stop Sign	13	8	-	-	-	-	13	8

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART II								
Reckless Driving	3	7	-	-	-	-	3	7
Right of Way	9	5	-	-	-	-	9	5
Negligent Driving	14	7	-	-	-	-	14	7
Defective Equipment	4	1	-	-	1	-	3	1
Illegal Passing	1	3	-	-	-	-	1	3
24. Parking	15	85	-	-	-	6	15	79
25. All Other Traffic Viol.	18	9	-	-	1	-	17	9
26. All Other Offenses:								
Malicious Mischief	3	-	-	-	3	-	-	-
Vandalism	8	4	1	-	4**	-	-	-
Bike Violations	7	-	-	-	7	-	-	-
Family Disturbance	1	2	-	-	1	2	-	-
False Fire Alarm	-	1	-	-	-	1	-	-
Public Nuisance	1	1	-	-	1	-	-	1
Investigation	6	3	1	-	5	3	-	-
Prowler	2	3	-	-	-	1	-	-
Disturbance	2	1	-	-	2	1	-	-
Molesting	2	1	-	-	1	-	1	1
Illegal Shooting	3	-	-	-	3	-	-	-
Injury to Property	-	1	-	-	-	-	-	1
Pickup for Outside Agency	1	-	-	-	-	-	1	-
Damage to Property	2	2	-	-	-	-	-	-
Obscene Phone Call	1	-	-	-	-	-	-	-
27. Suspicion	-	-	-	-	-	-	-	-
TOTAL PART II	153	165	2	-	32	16	111	141
PART III								
28. Missing Persons	3	2	1	-	3	1	-	-
Lost Persons	10	-	-	-	10	-	-	-
Lost Animals	5	-	-	-	-	-	-	-
Lost Property	32	3	-	-	24	-	-	-
29. Found Persons	1	-	-	-	1	-	-	-
Found Animals	3	-	-	-	2	-	-	-
Found Property	18	-	-	-	8	-	-	-
TOTAL PART III	72	5	1	-	48	1	-	-

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No.Rich.
PART IV								
30. Fat.M.V.Tr. Acc.	-	-						
31. Pers.Inj.M.V.Tra.Acc.	4	3						
32. Prop.Dam.M.V.Acc.	16	5						
33. Other Traffic Acc.								
34. Public Accident)								
35. Home Accidents)	No Accurate Statistics Kept							
36. Occupational Acc.)								
37. Firearms Accidents								
38. Dog Bites		1						
39. Suicides								
40. Suicide Attempts								
41. Sud. Death & Bod. Found								
42. Sick Cared For								
43. Mental Cases								
TOTAL PART IV	20	9						
COMPOSITE TOTALS								
PART I,II,III,IV CASES	189	184	2	-	33	18	113	142

*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 Grand Larceny cleared for previous year, and one Vandalism cleared for previous month.

Property reported stolen	Richland	$2,435.48
Property reported stolen	No.Rich.	$ 168.00
Property recovered	Richland	$1,476.98
Property recovered	No.Rich.	$ 23.50

MONTHLY REPORT		RICHLAND POLICE DEPARTMENT		JUVENILES INVOLVED										MAY
OFFENSES	NO. CASES	JUVENILES	SEX	5	6	7	10	11	12	13	14	15	16	17
RICHLAND														
Investigation	1	1	M	1										
Mischief	2	6	M			2		1	1				1	1
Vandalism	1	1	M							1				
Larceny	2	4	M							2	2			
Illegal Shooting	3	5	M					1	2		1		1	
Disturbance	1	1	M				1							
TOTALS	10	18		1		2	1	2	3	3	3		2	1
NORTH RICHLAND														
FALSE FIRE ALARM	1	1	M		1									
TOTALS	1	1			1									

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 (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 April	1954 May
Murder	.383	.064	-	-	-
Robbery	11.925	1.988	-	-	-
Agg. Assault	9.95	1.659	-	-	-
Burglary	73.55	12.259	19	3	1
Larceny	210.53	35.089	116	30	15
Auto Theft	39.23	6.538	4	2	-

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 (Jan-June 1953)		One Month Average	1953 Jan. - June	1954 April	1954 May
Murder	.371	.062	-	-	-
Robbery	8.43	1.403	-	-	-
Agg. Assault	2.03	.338	-	-	-
Burglary	62.28	10.38	19	3	1
Larceny	188.38	31.397	116	30	15
Auto Theft	34.0	5.667	4	2	-

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953 Jan. - June	Richland April 1954	Richland May 1954
Robbery	-	-	-
Burglary	28%	-	-
Larceny	16%	23%	7%
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 POL. 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 (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 April	1954 May
Murder	.153	.026	-	-	-
Robbery	4.77	.795	-	-	-
Agg. Assault	3.98	.663	1	-	-
Burglary	29.42	4.903	4	-	-
Larceny	84.21	14.035	52	11	10
Auto Theft	15.69	2.615	5	-	-

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 (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 April	1954 May
Murder	.153	.026	-	-	-
Robbery	3.37	.562	-	-	-
Agg. Assault	.81	.135	1	1	-
Burglary	24.91	4.152	4	-	-
Larceny	75.35	12.588	52	11	10
Auto Theft	13.60	2.267	5	-	-

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland 1953 Jan. - June	No. Richland 1954 April	May
Robbery	-	-	-
Burglary	-	-	-
Larceny	12%	9%	10%
Auto Theft	9%	-	-

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
RICHLAND JUSTICE COURT CASES
MAY 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	FINE SUSP
DEFECTIVE EQUIPMENT	3	3										$	$ 25.00	$
DRUNK DRIVING	5	5					1		5	1			241.00	
DRVG WHILE LIC. REV.	1			1										
EXCESSIVE NOISE	1		1									5.00		
F.T. DIM LIGHTS	1	1											5.00	5.0
F.T.Y.R.O.W.	7	6		1									57.50	22.5
ILLEGAL PARKING	14	5	8	1								24.50	17.50	10.5
ILLEGAL PASSING	1	1											5.00	
ILL. USE OF DR. LICENSE	2	2											40.00	
IMPROPER TURN	2	1	1									7.50	5.00	5.0
INVALID DRIVERS LICENSE	21	16	2	3			1					8.50	89.50	40.0
INVALID LICENSE PLATES	3	3											32.50	10.0
NEGLIGENT DRIVING	14	12	1	1			1					15.00	185.00	
NO REGISTRATION	2	1		1									10.00	
PERMIT UNLIC. OPER. TO DRIVE	1			1										
RECKLESS DRIVING	4	4							3				160.00	
SPEEDING	21	10	10			1				2		102.50	95.00	7.5
STOP SIGN	12	3	7	2								60.00	22.50	7.5
VIOLATION OF S.R. ACT	1	1					1							
LARCENY BY CHECK	3	2			1								25.00	20.0
PUBLIC INTOXICATION	7	2	5									72.50	25.00	5.0
VAGRANCY	1		1									15.00		
TOTAL	127	78	36	11	1	1	4		8	3		$310.50	$1040.50	$133.0

ONE NEGLIGENT DRIVING CASE AMENDED TO SPEEDING.

GB-26

1215964

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
MAY 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	FINE SUSP
DEFECTIVE EQUIPMENT	1	1										$	$ 3.50	$
F.T. DIM LIGHTS	1	1											7.50	
F.T.S. & I.	1	1											12.50	12.50
F.T.Y.R.O.W.	5	3	2									30.00	32.50	
FOLLOW TOO CLOSE	1	1											5.00	
ILLEGAL PARKING	78	4	47	27						1		157.50	14.00	7.00
ILLEGAL PASSING	5	4			1								26.00	
ILLEGAL TURN	1	1											3.50	
INVALID DRIVERS LICENSE	9	6	2	1								15.00	27.50	5.00
INVALID LICENSE PLATES	5	3	2									17.50	17.50	
NEGLIGENT DRIVING	8	5	3									65.00	140.00	15.00
NO REGISTRATION	1	1											5.00	5.00
PERMIT UNLIC. OPER. TO DRIVE	1	1											17.50	
RECKLESS DRIVING	5	3		2					2				156.00	
SPEEDING	6	1	3	2								35.00	10.00	
STOP SIGN	9	2	6	1								51.00	15.00	
INJURY TO PROPERTY	2	1			1		1							
PUBLIC INTOXICATION	9	1	8				1					130.00		
PUBLIC NUISANCE	2		2									30.00		
THIRD DEG. ASSAULT	2	2											27.50	12.50
TOTAL	152	42	75	33	2		2		2	1		$531.00	$520.50	$57.00

ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

GB-27

1215965

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
MAY - 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	April	May	April	May	April	May	April	May
Richland	19	20	0	0	0	0	1	4
North Richland	10	8	0	0	0	0	2	3

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken		Other Causes	
	April	May	April	May	April	May	April	May
Richland	5	2	4	8	2	1	8	9
North Richland	2	3	3	1	1	1	4	3

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	April	May	April	May	April	May	April	May	April	May	April	May	April	May
Richland	0	0	0	0	0	0	0	0	0	0	0	1	0	1
No. Richland	0	0	0	0	6	6	0	0	1	0	0	0	7	6

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	
	Apr.	May	Apr.	May	April	May	April	May	April	May	Apr.	May	April	May	Apr.	May	Apr.	May
Richland	13	19	6	12	3	4	14	4	3	7	19	14	24	14	28	39	110	113
N.Richland	6	6	7	9	7	0	5	6	1	5	10	7	77	77	16	26	129	136

TRAFFIC VOLUME COUNT: 24 Hour Traffic Volume Count on Williams Boulevard east of Stevens Drive, 6,016 vehicles.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY

G8-28

COMMUNITY OPERATIONS SECTION
RICHLAND FIRE DEPARTMENT
MONTHLY REPORT
MAY 1954

Organization and Personnel	Exempt	Non-Exempt
Employees - Beginning of Month	67	0
Transfers In	0	0
Transfers Out	1	0
Terminations	1	0
New Hires	2	0
End of Month	67	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$ 275.00	$ 0.00
	Personal	1,243.00	230.00
	May Total	$1,518.00	$ 230.00
	Year's Total	$3,363.00	$4,011.00
Response To Fire Alarms		26	31
Investigation of Minor Fires and Incidents		1	3
Ambulance Responses		40	
Inside Schools or Drills		26	12
Outside Drills		26	5
Safety Meetings		8	3
Security Meetings		4	2
Fire Alarm Boxes Tested		210	112

During the month the Fire Department provided artificial respiration instructors for 12 employee groups, totalling 481 people.

Group visitations to the fire stations during May included 34 juveniles and 7 adultsfrom Cub Scouts, Brownies and the School Handicapped Class.

Captain R. W. Hatfield attended a Human Relations training class and Captain H. W. Anderson attended the Conference Leading instruction class.

Five Boy Scouts were examined for their Firemanship Merit Badges.

Fire Department stood by at the AEC Airport during a May 12th landing and take-off of a plane.

Flagpole ropes were installed at two Little League Baseball fields.

Fire Prevention

Two hundred twenty two Richland and 34 North Richland fire inspections were conducted in May, resulting in 92 hazard reports. Five hundred eighty eight fire extinguishers were inspected, 20 required replacement, 2 were installed, 63 recharged, 50 serviced and 7 removed. Twenty four fire hose standpipes were inspected and 48 serviced.

Investigations were made of the May 4th kitchen fire at the Desert Inn and the May 18th tar pot explosion in Uptown alley.

1215967

Hazardous attic conditions in the 703 Building were reported to the 700 Area Landlord.

Assistance was given electricians during repairs to school auxiliary fire alarm systems.

Efforts were made to assist Community Engineering obtain automatic sprinkler coverage of the new Safeway Store building.

Consulted with School officials regarding converting the Chief Joseph Junior High School fire hose standpipes to dry valve system.

Fire Protection problems arising from the sale of Uptown business building to the several occupants was discussed with Community Engineering and Electrical units.

Fire extinguisher protection was provided for the May 15-16 Richland Horse Show.

By request of the architect, plans were reviewed for fire protection installations in the new Catholic school and convent.

A request was submitted for checking possible electrical overload in the Richland Theatre and temporary overload during the Television Show at the Desert Inn.

Trash conditions at the rear of the Uptown Theatre and Skewes Furniture Store were discussed with the management of these facilities.

Assistance was given on the acceptance inspection of the 746 Laboratory building fire alarm and sprinkler systems.

Sub-standard furnace installation in the new Duportail and Hartford service station was referred to Community Engineering.

COMMUNITY OPERATIONS SECTION
ENGINEERING UNIT
MONTHLY REPORT
MAY 1954

PERSONNEL	Exempt	Non-Exempt	Total
Employees - Beginning of month	6	3	9
Employees - End of month	6	3	9

BUILDING PERMITS ISSUED IN MAY:

None

NEW MUNICIPAL CONSTRUCTION STARTED IN MAY:

McMurray Street Paving

NEW PRIVATE CONSTRUCTION STARTED IN MAY:

None

ENGINEERING JOBS COMPLETED DURING MAY:

ESR I 90054 - Engineer Liaison, Richland Water

ESR I 90274 - Inspection, McMurray Road

ESR I 90354 - Water System Study for Irrigation Disposal. See ESR I 91014.

ESR I 90474 - Part II, Erosion Control & Development, Public Areas, FY 1953.

ESR I 90834 - Legal Description, Burlin Camp Area

ESR I 90884 - Relocate Water Line, Lee Blvd. and Duane Avenue - See Project L-884.

ESR I 90964 - Revised Legal Description, Richland Baptist Church, GWW.

ESR I 90974 - Structural inspection, recommendations, and cost estimate, Repair Old Liquor Store Building.

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED:

PROJECTS:

CA 570 Replace Raw Water Line, #5 Well to Lee Boulevard - Design progressing. 55% complete.

CA 577 Improvements to Existing Streets, George Washington Way, FY 1954 - Design 90% complete.

ENGINEERING UNIT (Cont.)

STATUS OF PROJECTS CONTINUED

K-811 Extend Sewer to New Commercial Building, Hartford and Duportail - Construction 90% complete. Awaiting scheduling of lawn seeding to complete.

L-728 Installation Fire Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Department.

L-384 Improvements to Medical Arts Building, Service Drive - Design complete. In hands of AEC for contract.

L-394 Replace Tennis Court Fences, Riverside Park - Notice to proceed given May 20, 1954.

L-884 Relocation of 8" Water Main on Duane Avenue, Lee Blvd. to Gillespie St.- Job out for bid. Bid opening to be June 8, 1954.

IR 167 Irrigation System - Jefferson School - Job out for bid. Bid opening to be June 8, 1954.

IR 165 Parking Facilities, Kadlec Hospital - Design Complete. In hands of AEC.

IR 171 Automatic Bar Screens, Sewage Lift Station - Bid package to Contract Services. Design 100% complete.

IR 173 Air Conditioning, Community House - Design complete. To AEC for review May 10, 1954.

IR 174 Electricity Metering, Richland Domestic Water System - Equipment being ordered.

IR 175 Expansion of Riverside Park - Job out for bid. Bid opening to be June 8, 1954.

IR 176 Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park - Awaiting project approval by AEC.

ENGINEERING SERVICE REQUESTS:

I 90014 Free Methodist Church - Construction 99% complete. No progress this month.

I 90024 First Baptist Church (Richmond and Raleigh Streets) - Construction 92% complete. No progress this month.

I 90034 Assembly of God Church - Construction 82% complete. Work progressing very slowly.

90044 Alteration Permits - An open active file. No permits issued this month.

Engineering Unit (Cont.)

Engineering Service Requests (Cont.)

I 90064 Television Antennae - An open active file. No permits issued this month.

I 90094 Plans, Specs., Inspections, Grace Bacon Roller Rink - Construction 98% complete. No progress this month. Open for business.

I 90104 Plans, Specs., Inspections, Newberry Building - Construction 99% complete. Exceptions not entirely cleared up. Open for business.

I 90114 Plans, Specs., Inspections, Latter Day Saints Storehouse - Construction 99% complete. Final inspection to be made.

I 90124 Plans, Specs., Inspections, American Legion - Construction 99% complete. Final inspection to be made.

I 90154 Plans, Specs., Inspections, Parcell Service Station, Duportail and Hartford - Construction 90% complete. Construction progressing on schedule.

I 90184 Plans, Specs., Inspections, Safeway Store - 70% complete. Construction progressing slowly. Plans are being changed to provide for a complete sprinkling system for the building.

I 90204 Plans, Specs., Inspections, EH Kidwell Service Station - Construction 40% complete. Progressing according to schedule.

I 90234 Inspection and Liaison, Bauer-Day Housing - Materially complete. Utilities not yet officially accepted.

I 90244 Plans, Specs., Inspections, Church of Nazarene Addition - Construction 68% complete. Work progressing very slowly.

I 90254 Plans, Specs., Inspections, Seattle First National Bank Addition - Construction 99% complete. Final inspection to be made. Open for business.

I 90264 Plans, Specs., Inspections, Richland Heights Baptist Church - Construction 5% complete. Work progressing on schedule.

I 90324 Design, Engineering, Inspection, Walks and Drives at Columbia Playfield - Design completed and forwarded to AEC for contract.

I 90334 Plans, Specs., Inspections, Richland Baptist Church, GWW - Construction 70% complete. Progressing rapidly.

I 90374 Plans, Specs., Inspections, LG Cook Construction & Maintenance Building - (For second addition see ESR I 90684) - Construction 99% complete. Final inspection to be made.

Engineering Unit (Cont.)

Engineering Service Requests (Cont.)

I 90504 Plans, Specs., Inspections, Pleiss-Davis Addition - 99% complete. Final inspection to be made.

I 90594 "As Builts" General, Part II - 70% complete. Work delayed for other pressing work prior to start of fiscal year.

I 90604 Inspection 24" Sanitary Sewer, Swift Boulevard - Construction 60% complete. Work progressing slowly far behind schedule.

I 90614 Legal Description, Parking Lot, Baptist Church, GWW - 90% complete.

I 90624 Title III services, Storm Drain, George Washington Way - Contract let, but construction not started.

I 90634 Kadlec Hospital Grounds Improvements - Design is complete and has been submitted to AEC for contract.

I 90674 Utility Lines, Plots for Churches - 90% complete.

I 90684 Plans, Specs., Inspections, LG Cook Building Addition - 95% complete. Open for business.

I 90704 Plans, Specs., Inspections, Catholic Church - Construction progressing rapidly. No building permit issued to date. Plans not completely approved.

I 90724 Extension Duane Avenue Shelterbelt - Project proposal ready for review.

I 90734 Sewer and Water Connections, Richland Heights Baptist Church, Thayer and Duportail - Design sketch prepared for early construction.

I 90754 Legal Description & Diagrams, Churches - 50% complete.

I 90764 Plans, inspections, Rest Rooms, Desert Inn - 99% complete. Final inspection to be made.

I 90774 Legal Description with utilities and plot drawing, SE corner Lee Blvd. and Wellsian Way - 95% complete.

I 90784 Legal Description with utilities, Plot SW corner Skyline Theater - 75% complete.

I 90794 Legal Description with utilities, Junior Chamber of Commerce - 75% complete.

I 90804 Legal Descriptinn, Safeway Building #1 - 90% complete.

I 90814 Legal Description, Plot west of By's Burgers - 25% complete.

12[illegible]72

Engineering Unit (Cont.)

Engineering Service Requests (Cont.)

I 90824 Legal Description, Plot on east side of Wellsian Way - 90% complete.

I 90844 Plans, Specs., Inspections, Central UP Church - Plans received. Awaiting request for building permit.

I 90854 Legal Description, Area east of Stevens between Lee and Knight - 50% complete.

I 90864 Legal Description, Site A, Corner of Goethals and Williams - 75% complete.

I 90874 Legal Description, Site B, Corner of Goethals & Williams - 75% complete.

I 90894 Legal Description, Plot south of Linn Motors - 75% complete.

I 90904 6" Water Main, Stevens Drive, Kadlec Hospital to Central UP Church - Project ready for AEC review.

I 90914 Utility Lines, Legal Descriptions and Diagrams, Churches - 25% complete.

I 90924 Legal Descriptions, Eat Plot, Lots 1, 2, and 3, Wright and Van Giesen - 50% complete.

I 90934 "As Builts" Commercial Buildings (Skyline Theater, Rice Rug, Diettrichs Market, and Richland Theater) - Deferred for other work.

I 90944 Erosion and Dust Control, 300 Area - Project being prepared.

I 90954 "As Built" Plans, Medical-Dental Properties - Deferred for other work.

I 90984 Legal Description, 737 Stevens Drive - Delayed by other work.

I 90994 Cost Estimate, Metal Duct Work, Desert Inn - Deferred for other work.

I 91004 Guthrie Ave. Sidewalk and Street Widening, Gilmore to Goethals - 10% complete.

I 91014 Retirement of Separate Irrigation System - Preliminary engineering in progress.

I 91024 Retirement of Irrigation Canal - Preliminary Engineering in progress.

I 91034 Survey, SE corner Concrete Inc. property - starting delayed by other work.

COMMUNITY REAL ESTATE SECTION

MAY 1954

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Real Estate Administration				
350	2	1	2	1
Housing & Maintenance Unit				
351	4	18	4	18
353	10	141	10	135
Commercial Property Unit				
357	6	5	6	5
	22	165	22	159

Decrease in number of employees 6

The decrease in nonexempt personnel is due to removals from payroll because of terminations and leaves of absence.

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING MAY 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	2226	253	10	386	832	1135	10	53	62	199	38	5204
Comm. Fac.	91	18		29	63	49		5	3	8	2	268
AEC	73	26		21	59	15		5	4	15	3	221
Other Gov't	7	2			3	1					1	14
Post Office	5				2	9				1	3	20
Schools	57			7	10	53			1	1		129
Comm. Activities	9			1	6	4					1	21
Med. Facilities	3	20			3	1				3		30
Chas. T. Main	3			2	5	7				2		19
Kaiser Eng.	6	8		1	7	1						23
J. A. Jones	2	2			2	1						7
Blaw-Knox	3	2		2	1							8
P. S. Lord	1				2					1		4
Vitro Corp.	1				1							2
Vernita Orchards											5	5
Minor Const.					1							1
Commonwealth Inc.						1						1
Disco Const. Co.		1										1
Certified	4	1			2	7					1	15
Turnover						1						1
Total	2491	333	10	449	999	1285	10	63	70	230	54	5994
Assigned Leases Written						3						3
Assigned Leases Not Written	8					7						15
Available For Assignment	1			1	1	2		1				6
Total	2500	333	10	450	1000	1297	10	64	70	230	54	6018

	Begin Month	Moved In	Moved Out	End of Month	Diff.
Conventional Type	2498	+11	-18	2491	-7
A&J Type	333			333	
"T" Type	10			10	
Precut Type	449	+2	-2	449	
Ranch Type	1000	+1	-2	999	-1
Prefab Type	1291	+25	-31	1285	-6
Dorm Apts.	10			10	
A&J Apts.	64		-1	63	-1
2BR Apts	68	+3	-1	70	+2
Fourth Housing Apts	230			230	
	54			54	
Total	6007	+42	-55	5994	-13

May 1954

DORMITORY REPORT

Dormitories:

	Beds Available	Vacant Beds	Occupied Beds
Men	477	50	427
Women	381*	60	321
Total	858*	110	748*

*This includes 2 beds used for Dorm Offices

WAITING LISTS

	Single Rooms	Double Rooms
Men	1	0
Women	4	0

The following Dormitories are in Stand-by condition;

W 21	50 beds	W 16	50 beds
W 17	50 beds	W 15	50 beds
		M 7	39 beds

Total Beds 239

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	16
R. O. F.	0
Discharge	0
Transfers	2
Retirement	3
Move off project	9
Divorce	0
Death	4
Move to Wherry House	0
Misc.	0
Not eligible	1
Total	35

ALLOCATIONS

Houses allocated to new tenants	19
Exchanged houses	18
Moves(within the village)	23
Turnovers (Divorce or Death)	4
Total leases signed	64
Total cancellations	80
Wherry house move to G. E. house	0
Houses assigned As Is	20
Houses sent to renovation	18
Applications pending	280

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
Total	34	8	2	44

* Removed from records but not sent to excess.

TENANT RELATIONS PROGRESS REPORT

	Orders incomplete as of April 30, 1954	Orders issued 4-30 to 5-31	Total orders Incomplete as of May 31, 1954
Service orders	574	1522	517
Work orders	727	388	732
Service charges		171	

Principal work order loads

	Incomplete as of April 30, 1954	Incomplete as of May 31, 1954
Laundry tub replacement	16	18
Bathroom renovation, (tub, tile, lino.,)	11	2
Tileboard bathroom	11	7
Kitchen floor linoleum	56	45
Kitchen cabinet linoleum	62	50
Shower stall	6	9

---

98 alteration permits were issued, as compared to 92 issued during April.

Install air conditioner	25	Install patio	5
Install automatic dryer	8	Install screened porch	1
Install automatic washer	12	Install door	3
Install fence	11	Remove kitchen cabinet	1
Install clothes poles	1	Install addition wiring	3
Convert to oil	1	Remove broom closet	1
Install water softener	1	Install fireplace	4
Install window	1	Remove coal bin	1
Excavate basement	3	Install TV antenna	3
Install sidewalk	1	Remove laundry trays	1
Install shade shelter	1	Install tool shed	1
Install greenhouse	1	Sand & refinish floors	2
Reverse range & refer	1	Install garbage disposal	1
Raise threshold	1	Install driveway	2
Install wooden ramp	1		

---

552 inspections were made, as compared to 588 made in April.

Alteration permits	79	Basement	2
Bathrooms	4	Doors	11
Fill	6	House	5
Floorboards	5	Laundry trays	16
Linoleum	60	Lot lines	5
Porch & steps	23	Recall range & refer	2
Shower stall	9	Shower rods	2
Sidewalk	16	Sink	9
Toilet	2	Toilet seats	24
Trees	7	Walls	2
Windows	2	Yard	10
Miscellaneous	18	Dormitories	17
Renovations	76		
Cancellations	98	Shows (new tenants)	38

INTERIOR REDECORATING REPORT

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	168	3	168	0
B	366	2	366	0
C	0	0	0	0
D	5	0	5	0
E	42	0	42	0
F	112	0	112	0
G	3	0	3	0
H	80	0	80	0
K	0	0	0	0
L	4	0	4	0
M	2	0	2	0
Q	8	0	8	0
R	2	0	2	0
S	2	0	2	0
T	8	0	7	1
U	7	0	7	0
V	39	2	39	0
Y	197	0	197	0
Z	5	0	5	0
1BP	47	1	38	9
2BP	187	7	187	0
3BP	222	11	187	35
Tract	10	0	10	0
1 BR Apt.	11	0	11	0
W-13 Apt.	3	0	2	1
Total	1530	26	1484	46

10 Units added

Est. MH B. F.	70,500	Actual MH B.F.	68,778
This Mo. Est. MH	1,175	Actual MH This Mo.	1,231
Total Estimate	71,675	Total Actual MH	70,009

EXTERIOR PAINT REPORT

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	244	11	11	233
B	288	47	47	241
D	2	0	0	2
E	43	10	10	33
F	115	18	18	97
G	5	0	0	5
H	152	24	24	128
L	39	2	2	37
Tract	20	3	3	17
Total	908 (1440)	115	115	793

Estimated Manhours 5638

Actual Manhours 7321

Total Season Estimate 47,732

PLUMBING SHOP

JOB DESCRIPTION	NO. COMPLETED
Replacements - Major Fixtures:	
Bathtubs	10
Shower Stalls	7
Electric Water Heaters	13
Laundry Tubs	7
Plumbing Work Orders	27
Plumbing for floor tile replacement	17
Cleared major sewer stoppages caused by tree roots	52
Plumbing for sink top replacements	38
Steam work orders	13
Replaced street steps	3

Steam inspection once a week on dormitories, apartments and Government owned commercial buildings.

Excavated with backhoe machine sewer lines, water mains and all leaking and broken underground piping so repairs could be made.

Turned off steam heat in all commercial buildings.

SERVICE ORDER CREW

The following is a status report on service orders:

A.	On hand at the beginning of the month	288
B.	Received during the month	1467
C.	Completed during the month	1526
D.	On hand at the end of the month	229

E. A total of 289 manhours were spent on work orders.

F. Back log of service orders by craft:

Plumbing	41
Electrical	80
Carpentry	108
Total	229

RENOVATION AND LABOR CREW

JOB DESCRIPTION	NO. COMPLETED
Renovation orders processed	17
Trash pickups	34
Minor carpenter repairs to housing units	22
Minor carpenter repairs to dormitories	6

Sprayed entire dormitories M-1 and M-2 for silverfish

All occupied dormitories serviced with linen and janitorial supplies.

Dormitory rooms redecorated	0

MECHANICAL SHOP

JOB DESCRIPTION	NO. COMPLETED

A. Millwright Crew:

Routine furnace inspection	75
Furnace service orders	43

"A" frames have been made and installed on two dump trucks to facilitate the loading of tree stumps that are being removed.

Portable work benches were fabricated for the Carpenter Shop to repair screens in the field.

Trailer hitches were made and installed on two pickup trucks.

B. Sheetmetal Crew:

Replacement of shower stalls	5
Replacement of gutters	14
Flashing around coal hatches	6
Metal thresholds	24

An air cooler was fabricated and installed in the Housing Office storage room.

A sheetmetal hatch cover was made and installed on Chlorine well at North Richland well field.

Work has been started on renailing the metal flashing and gutters on all prefab roofs.

MECHANICAL SHOP (Cont.)

C. Truck Drivers and Servicemen:

Tree removals	17
Sidewalk removals	9
Sidewalks repaired	5

CARPENTER AND LINOLEUM SHOP

JOB DESCRIPTION	NO. COMPLETED
Install bathtubs	10
Replace bath wall tile	10
Repair bath wall tile	1
Replace bath floor linoleum	15
Repair bath floor linoleum	2
Replace bath floor strippers	2
Replace kitchen floor linoleum	35
Repair kitchen floor linoleum	3
Replace steps and landing linoleum	5
Repair steps and landing linoleum	1
Replace bedroom floor linoleum	3
Repair bedroom floor linoleum	1
Replace utility room floor linoleum	1
Replace living room floor linoleum	2
Repair living room floor linoleum	1
Replace floor tile - Commercial Facility	1
Replace sink top linoleum	75
Replace work bench linoleum	11
Replace kitchen sinks	4
Replace sash balances	3
Repair wall	2
Repair floor boards	1
Repair roofs-dormitories	1
Repair roofs - commercial facilities	4
Repair roofs - houses	3
Raise slab	4
Repair porches	154
Concrete walks and forms	3
Chempoint - routine orders	20
Chempoint - work orders	81
Paint touch ups	115
Interior carpenter repair - houses	5

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION
May, 1954

PERSONNEL - COMMERCIAL PROPERTY UNIT:	May
Beginning of Month	11
End of Month	11
Net Change	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
April	1,635	194	120	1	1,755	195
May	1,639	191	120	1	1,759	192
Net Change	+ 4	- 3	0	0	+ 4	- 3

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	42	12	3	0	45	12	57
Back Charges	0	0	0	0	0	0	0
FY Work Orders	507	192	14	0	521	192	713
FY Back Charges	26	1	4	0	30	1	31

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Supplemental Agreements:

   a. The Mart - to provide for subleasing the portion of the business operation formerly operated by Lessee.

   b. Walton-Hills, Ins. - to provide for restated and redefined rights and duties of the parties.

2. Business Development:

   Advertisements inviting inquiries on vacant land sites and Government-owned buildings available for lease, were placed in nine northwest newspapers.

B. Noncommercial:

1. Leases:

a. First Baptist Church - a ground lease covering the construction and operation of a church in North Richland.

b. Richland Lutheran Council of the National Lutheran Council - a ground lease covering the construction and operation of a church in North Richland.

2. Supplemental Agreements:

a. Reorganized Church of Jesus Christ of Latter Day Saints - to provide for a revised description of the leased premises.

b. Parish of All Saints - to provide for an increase in size of the leased premises.

GENERAL:

A. Commercial:

1. Emma Eades, subleasing space in the Recreation Hall from W. T. Vosper and Leo G. Torre, for operation of cafe, terminated.

2. Della Kendrick, subleasing space in the Recreation Hall from W. T. Vosper and Leo G. Torre, for operation of cafe, opened for business.

3. Kennison Furs, subleasing space at 235 Symons, Automatic Laundry Company building, terminated.

4. Lyle Lancaster, subleasing space at 235 Symons, Automatic Laundry Company building, for operation of a gift shop, opened for business.

5. Allene Winham, subleasing space in Uptown Theatre building, for operation of a gift shop, terminated.

6. Al Nihart, subleasing space in Uptown Theatre building for operation of a jewelry shop, opened for business.

7. William M. Compton, subleasing space in Cannon-Joseph #2 building for operation of an insurance office, terminated and opened for business in Richland Development Co., Inc. building.

8. Dr. William W. Freiday, subleasing space in the Diana Langevin building for operation of an optometrist office, opened for business.

9. E. B. Laird & Co., subleasing space in the L. G. Cook building for operation of a custom upholstery shop, opened for business.

10. J. R. Parcell opened his Texaco Service Station located at Duportail and Hartford Streets.

B. Noncommercial:

1. A deed transferring title to Government building and land was executed by the United States Atomic Energy Commission on May 3, 1954, conveying title to the Central United Protestant Church Incorporated.

2. One pasture permit was issued and two assignments of pasture permit were executed.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland:

Service Stations
Drive-In Restaurant
Equipment Yard
Paint and Glass Retail
Tavern
Loan Company

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION

May, 1954

SUMMARY OR OCCUPANCY AND EXPANSION STATUS

A. COMMERCIAL:

	APRIL			MAY		
	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	41	6	47	42	6	48
b. Number of Businesses operated by Sublessees	110	1	111	112	1	113
c. Total Businesses in Privately-owned Buildings	151	7	158	154	7	161
4. Privately-owned Buildings under Construction	6	2	8	6	2	8
5. Total Number of Businesses in Operation	206	16	222	209	16	225

Gh-13

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION

May, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

		APRIL			MAY		
		Richland	North Richland	Total	Richland	North Richland	Total
1. Government-owned Buildings							
a. Churches		4			3		
b. Clubs and Organizations		5			5		
c. Government Agencies		2			2		
	Total	11		Total	10		
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. Pasture Land Permits				100			101

Ch-14

1211937

RADIOLOGICAL SCIENCES DEPARTMENT

MAY, 1954

Summary

Thirty-six informal, 4 Class I and 3 Class II radiation incidents were recorded. All the Class II incidents related to spots of contamination on body or clothing.

An additional release of radioruthenium caused a strong band of contamination to the north and another one to the east. Construction areas and military camps were potentially affected by the incident.

General fall-out from the Pacific tests continued at low levels.

In research and development, the uptake of plutonium by the pig was found to be essentially the same as in the rat; this strengthens the validity of application to man. Dichromate toxicity to plants was such that the effects of continued irrigation with river water cannot be completely dismissed. A resolution of previous discrepancies between measured and calculated values of the Ru^{103} - Ru^{106} isotopic ratio in fission products was achieved.

[redacted] HW-31964 DEL

Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

MAY, 1954

Organization

The month-end force of 371 included 39 supervisors, 90 engineers and scientists, 19 clerical and 223 other personnel. Significant changes from last month are due to the establishment on the EAO system of Unit Head positions formerly classified as professional.

Number of Employees on Payroll

Beginning of month	-	377
End of month	-	371
Net decrease	-	6

General

There were 36 informal, 4 Class I and 3 Class II radiation incidents. All 3 Class II incidents arose from localized spot contamination with no expectation of untoward consequences.

An information meeting, appropriately held with the secretarial force on National Secretaries' Day, led to suggestions through which this group of employees could more effectively participate in the departmental strengthening of communication channels.

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

INVENTOR	TITLE
J. J. Fuquay	Anemometry - Wind Component Meter

RADIOLOGICAL ENGINEERING

The new Bioassay Laboratory, located west of the 700 Area powerhouse, was occupied.

Calculations indicated that the Ru^{103} - Ru^{106} ratio in process effluents was approximately halved by consideration of the yields from Pu^{239} fission, thus bringing calculations to a much better agreement with measurements obtained on material emitted from the Redox stack.

Following a slug rupture, effluent retention basins can be safely used after a suitable settling period. However, it still appears to be sound practice to pass basin water with significant solids content through emergency cribs.

Specifications were issued for the sampling and analysis of condensate expected from self-concentration operations at the new SX tank farm. Ground disposal of bottoms previously returned to storage tanks from evaporation of first cycle waste supernate appears to be permissible under carefully controlled conditions.

Analysis of well drawdown and tracer tests performed near Gable Mountain indicated significant variations in ground water velocity throughout the depth of the ground water bed with high velocity at the top and virtually no movement over a period of weeks at the bottom of the tracer-spiked well.

Severe depositions of radioruthenium in two narrow bands, approximately north and east respectively from the Redox Plant, caused potentially troublesome contamination in and around critical construction areas and military posts. Work on Recuplex waste facilities could not be restarted under the existing conditions.

The proposed report of the U.S.P.H.S. on Columbia River Studies included some material highly prejudicial to the Company's position. In our opinion, these portions are not founded on an enlightened interpretation of radiological hazards. With the cooperation of the Atomic Energy Commission and the Columbia River Advisory Group, it is hoped that agreement can be reached with the Public Health Service to make suitable revisions before publication.

RADIOLOGICAL RECORDS AND STANDARDS SECTION

Radiation Monitoring Unit

	April	May	1954 to Date
Special Work Permits	543	632	2,753
Routine and Special Surveys	1,973	1,625	8,460
Air Samples	1,649	1,493	7,932
Skin Contamination	17	26	96

A flash fire occurred in the 234-5 Building during the dissolving of plutonium turnings with concentrated nitric acid. Solution was sprayed about the hood and two persons received skin contamination. Air samples taken near the hood during the incident showed unusually high plutonium activity. (Class I, No. 359)

Skin and clothing contamination was detected on a construction employee subsequent to work at the Redox expansion construction area. One spot on the shirt front of the employee showed a dosage rate of 21 rads/hr and investigation indicated that the dose to a small spot on the skin beneath was between 3.5 and 21 rads. (Class II, No. 74)

A vehicle decontamination station was established at the 269-W Building at 200-West Area for the decontamination of vehicles picking up ruthenium contamination from the plant roads. Surveys were performed at the 700 and 1100 Area garages on all vehicles arriving there for repair work. A temporary zone was established at the 100-B Area garage for the servicing of contaminated Patrol vehicles.

A chemical waste disposal ditch near the Redox swamp was discovered to be contaminated and dosage rates up to 300 mrads/hr were observed along the edges of the ditch.

Radiological Standards

Radiation Incidents

Type	April	May	1954 to Date
Informal	21	36	133
Class I	5	4	33
Class II	1	3	10

All the Class II incidents related to localized contamination spots.

Exposure Records

Personnel Meters, and Records and Photometry

	April	May	1954 to Date
Gamma Pencils read	232,608	234,374	1,117,686
Potential overexposures	12	7	53
Conformed overexposures	1	0	2
Slow neutron pencils read	1,288	1,598	5,422
Potential overexposures	0	0	1
Confirmed overexposures	0	0	0
Beta-Gamma film badges processed	37,273	37,848	182,064
Potential overexposures	29	42	293
Confirmed overexposures	1	0	2
Fast neutron badges processed	436	547	2,003
Potential overexposures	1	0	2
Confirmed overexposures	0	0	0
Lost readings (all causes)	43	30	210

Bioassay

Plutonium Analyses

	April	May	1954 to Date
Samples assayed	1,002	771	4,117
Results above detection limit*	38	35	135
Resamples assayed	47	25	186
Results above detection limit*	12	12	54
Maximum d/m/sample	1.39	2.27	2.27

*Detection Limit was 0.05 d/m

Fission Product Analyses

	April	May	1954 to Date
Samples assayed	1,032	826	4,440
Results above 10 c/m/sample	1	0	10

Uranium Analyses

Results of 248 samples processed this month are tabulated below. This brings the total number of samples processed in 1954 to 1,353.

	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	11.5	2.5	46	16.4	2.2	37
Technical	55.9	6.7	6	187.2	20.1	15
UO_3 Plant	30.7	3.6	136	-	-	-
Radiation Incidents	43.7	8.5	8	-	-	-

Tritium Analyses

	Activity Density (/uc/cc x 10^3)						
	0-5	5-10	10-35	35-70	>70	Total	1954 To Date
Number of Samples	181	12	0	0	0	193	1,453

Thyroid Checks

All thyroid checks reported were below the warning level

Hand Score Summary

There were 56,536 alpha and 70,346 beta scores reported. About 0.003% of the alpha and 0.007% of the beta scores were above the warning level. Two of the high beta scores were not reported and no attempt was made to decontaminate. Decontamination of all other cases was attempted and successful.

Calibrations

	Number of Routine Calibrations		
	April	May	1954 to Date
Fixed Instruments	91	67	381
Portable Instruments	3,729	3,116	16,264
Personnel Meters	16,993	11,484	80,327
Total	20,813	14,667	96,972

BIOPHYSICS

Control Unit

Regional Survey

The general findings are summarized in the following table:

Sample Type and Locations	Activity Type	Average Activity Density
		/uc/cc
Drinking Water and Related Materials		
Benton City Water Co. Well	alpha	1.4×10^{-8}
Richland, N.Richland, Benton City Wells	alpha	$(<0.5 \text{ to } 1.1) \times 10^{-8}$
100 Areas	beta	$(1.0 \text{ to } 4.6) \times 10^{-7}$
Pasco, Kennewick, McNary Dam	beta	$(<0.5 \text{ to } 2.4) \times 10^{-7}$
Backwash Solids - Pasco Filter Plant	beta	2.8×10^{-2} /uc/g
Backwash Liquids - Pasco Filter Plant	beta	4.6×10^{-7} /uc/cc
Sand Filter - Pasco Filter Plant	beta	8.5×10^{-5} /uc/g
Anthracite Filter - Pasco Filter Plant	beta	7.1×10^{-5} /uc/g
Other Waters and Related Materials		
300 Area Wells #1, 2, 3	alpha	$< 5 \times 10^{-9}$
300 Area Well #4	alpha	No sample
Well #4 Measured as Uranium	U	No sample
Other Wells on the reservation	beta	$(<0.5 \text{ to } 3.3) \times 10^{-7}$
Columbia River - Hanford Ferry	beta	1.1×10^{-5}
Columbia River - Below Reactors	beta	8.7×10^{-6}
Columbia River - Patterson to McNary	beta	$(1.0 \text{ to } 3.0) \times 10^{-7}$ /uc/g
Columbia River - Shore Mud	beta	$(3.2 \text{ to } 7.8) \times 10^{-5}$ /uc/g
Raw Water - Operating Areas	beta	$(<0.05 \text{ to } 1.3) \times 10^{-6}$
Reactor Effluent Retention Basins to River*	beta	15,000 to 30,000 /uc/sec $(5.1 \text{ to } 6.3) \times 10^{-3}$
Reactor Effluent Retention Basins to River	alpha	$<14 \text{ to } 30$ /uc/sec $(<5 \text{ to } 6) \times 10^{-9}$
I-131 in Farm Wastes to River	I-131	30 /uc/day 5.6×10^{-7} /uc/cc
I-131 in Columbia River - Hanford	I-131	1.6×10^{-7}

Sample Type and Locations	Activity Type	Average Activity Density /uc/cc
Atmospheric Pollution		
Gross Alpha Emitters	alpha	(<0.4 to 1.8) x 10^{-14}
Gross Dose Rate - Separations Areas	beta-gamma	1.7 to 37 mrads/day
Gross Dose Rate- Residential Areas	beta-gamma	0.3 to 1.0 mrads/day
Active Particles - Separations Areas	beta	(0.07 to 1.7) x 10^{-11}
I-131 Separations Areas	I-131	(0.1 to 6.4) x 10^{-12}
I-131 Separations Stacks	I-131	1.4 curies/day
Ruthenium - Separations Stacks	$Ru^{103,106}$	0.6 curie/day
Rare Earths + Yttrium Separations Stacks	beta-gamma	0.1 curie/day
Active Particles - Wash., Idaho, Ore., Montana	-	0.02 to 0.39 ptle/m^3
Active Particles - HAPO	-	0.03 to 1.7 ptle/m^3
Tritium (as oxides) - Reactor Stacks	T	1.22 curies/day
Vegetation		/uc/g
Environs of Separations Areas	I-131	(0.9 to 8.5) x 10^{-5}
Residential Areas	I-131	(.10 to 1.5) x 10^{-5}
Eastern Washington and Oregon	I-131	3 x 10^{-6}
Non-Volatile Beta Emitters Wash. and Oregon	beta	4.3 x 10^{-5}
Alpha Emitters - Separations Areas	alpha	(2.0 to 7.3) x 10^{-7}
Alpha Emitters - 300 Area	alpha	1.9 x 10^{-7}

*The values published in the April summary for this item should have been 17,000 to 27,000 /uc/sec.

Ground contamination, observed first in 100-B Area by Radiation Monitoring forces on May 23, was found to extend from 200 West Area in a direct line to 100-B and thence to Wahluke Slope. Dosage readings observed along a narrow path approximately 2,000 feet wide were as high as 1.5 rads per hour at 100-B Area and 250 mrads per hour on Wahluke Slope. Contaminating material was found to consist of greater than 97% ruthenium with the Ru^{103} - Ru^{106} ratio indicating that the material was older than most ruthenium emitted from the Redox stack. Date and time of this particular emission have not been defined.

Fallout at all Pacific Northwest sampling stations was noted over the period from May 8 to May 10. Airborne radioactive particle concentrations were as high as six particles per 1,000 cubic meters at Lewiston, Idaho, and resulting vegetation contamination was as high as 3 x 10^{-3} /uc/g at Pasco.

[redacted] DECLASSIFIED

Analytical Control Laboratory

Routine and special analyses were carried out as follows:

Control Laboratory	Analyses Completed April	May	1954 Total
Sample Type			
Vegetation	1211	1234	6304
Water	2453	2003	10411
Solids	286	235	1171
Air Samples	575	482	2522
Uranium (Fluorophotometer)	616	471	2791
Oil Fog (Fluorophotometer)	178	329	507
Special Survey Samples (R.M.S.S.)	13	2	63
Special Survey Samples (R.M.U. and R.S.)	50	30	172
Tritium Oxide (Phillips Petroleum)	2	0	2
Tritium Oxide (Special Samples)	322	519	841
TOTAL	5,706	5,305	24,784

Control Services

Decay curve studies were made of air, rain water, and vegetation samples collected during the minor fallout of May 10, 1954. These decay curves indicated the fallout was from a bomb explosion after May 1.

It was determined that minimum radiothorium activity would occur 4.8 years after isolation of radiothorium from other members of the radioactivity series.

Synoptic Meteorology

Type of Forecast	Number Made	Percent Reliability
8 hour production	93	86.0
24 hour general	62	83.3
Special	104	77.9

Temperature averaged 62.9°F which was near the normal of 62.2°. The range, however, was extremely high, being from 28° on May 1 to 98° on May 18. The former mark was the lowest May temperature of record for the Hanford area.

Precipitation totalled 0.41 inch which was near the normal of 0.44.

RESEARCH AND DEVELOPMENT ACTIVITIES

Experimental Meteorology

Field and laboratory difficulties in oil fog sampling led to re-examination of the entire technique, which is still continuing.

Laboratory tests were completed and field tests started on the re-designed counting rate meter circuit for the portable mast anemometers.

Earth Sciences

Fission product analyses of sediment samples from 200 feet beneath the 241-T second cycle crib, and 130 feet beneath the 216-S crib disclosed that more than 90% of the beta-gamma emitters at those points is Ru and less than 10% is Cs although more than 50,000,000 liters of waste solution containing mixed fission products has gone to each unit; presumably the other nuclides and much of the Cs are residing at higher points in the soil column.

Details of water movement around a well at Gable Mountain were elucidated by combined spiking with fluorescein, sodium nitrate and tritium oxide.

Cumulative equilibrium adsorption curves for Sr appear to be similar to those for Cs in continued adsorption but with greater percentage decreases with successive treatments.

Soil column studies of Cs and Sr adsorption from synthetic and actual composite first cycle waste evaporator bottoms indicate that both nuclides are almost completely adsorbed from three column volumes of solution.

Industrial Hygiene

The study of internal contamination of respiratory protective equipment was continued, using stable ruthenium. Particles were found to range from 0.5 micron to less than 0.01 micron, arising from the reduction of RuO_4 to RuO_2. Samples of RuO_4 were collected on activated charcoal and on silica gel with high efficiency until the adsorbent approached saturation. Under the experimental conditions used, silica gel adsorption resulted in decomposition of the RuO_4 to RuO_2.

An aerosol sample was collected in the off gas line downstream from J1 filter in Redox during ruthenium oxidation. More than 99.99% of the radioactive material was collected on an assembly of AAA glass fiber filter backed by a Whatman #41 filter. Approximately 0.007% was picked up in a following silica gel adsorber; no detectable amount passed through the latter.

Results of analysis of cascade impactor samples collected in the ruthenium off gas line showed that most of the radioactive material was particulate in nature.

Methods

The design of a diffusion cloud chamber was completed. The instrument will allow the determination of tritium in ground and contemporary water samples without extensive tritium enrichment. Small samples and short electrolysis times will be possible. Use of this method of counting will eliminate the necessity for the large electrolysis facility previously anticipated for this work.

A survey was completed of the radiostrontium levels in milk from dairies which obtain their milk from cows in the area surrounding HAPO. No milk was found to contain radiostrontium to an extent greater than 4% of the MPC of Sr^{90} for drinking water as listed in Handbook 52. However, this is 40% of the conventional safe working limit. It is not implied that the contamination arises from Hanford operations; rather it is part of a nation-wide problem induced by weapons tests. It will have to be determined whether the local operations add a significant component to the over-all contamination.

A procedure for the determination of Sb^{125} in process solutions was developed which had a radiochemical yield of 63% with a standard deviation of 4.2%.

Mo^{99} was successfully isolated from some reactor cooling water samples in a radiochemically pure state. The procedure was also successfully applied to the determination of Mo^{99} content in rain samples containing fallout material.

The solubility coefficient (k) and the diffusion coefficient (D) for HT gas in Lucite were determined from permeability measurements: $k = 1.5 \times 10^{-6}$ moles $HT \cdot cm^{-3} \cdot mm^{-1}$ Hg; $D = 1.2 \times 10^{-5}$ cm^2 hr^{-1}.

Absorption curves and backscatter measurements were completed on Zn^{65}.

Physics

Functional improvements were made in the recently installed positive ion Van de Graaff equipment.

To provide information for interpretation of beta ray measurements, the sensitivities of a C.P., a Juno, a thin wall C.P., and a special bowl-shaped ion chamber attached to a C.P. instrument were determined for a beta ray source at different angular positions with respect to the instrument axis.

It was found that air containing tritium can function in a Geiger counter at low pressure with an efficiency of about 25%.

An improved age-diffusion theory treatment of the problem of a thin beta ray source in a uniform medium was made with results in better agreement with experimental data.

Instrument Development

Various schemes for obtaining scaling action at low cost were investigated in connection with the construction of a multiple channel energy analyzer. Decade scaling tubes and Swiss made registers were found to provide a low cost scale of 100 with 10 microsecond resolution and maximum sustained speed of 1000 c/s.

Considerable development was done on units potentially suitable for the telemetering system for meteorological and radiological data.

Designs for a new hand counter for counting alpha and beta-gamma radiations simultaneously were formulated and limited tests were made on the detection elements.

Fabrication of the instrument for surveying ground contamination from a moving vehicle was completed and tests were started in the laboratory. Such equipment is badly needed if the present area contamination with ruthenium continues.

BIOLOGY

Aquatic Biology

Highlights of the Columbia River Survey:

Organism	Location	Sample Type	Activity Density (μc/g) April	Activity Density (μc/g) May
Salmon fingerlings	Hanford	Max.	1×10^{-3}	1.9×10^{-3}
Minnows (shiners)	Hanford	Ave.	4×10^{-4}	6×10^{-4}
Whitefish - scales	Hanford	Max		2.4×10^{-3}
flesh	"	"	1×10^{-4}	2×10^{-4}
Plankton	Hanford	Ave.		6.3×10^{-3}
Midge larvae	McNary Reservoir	Ave.	1×10^{-4}	1×10^{-4}

Effluent Monitoring

Monitoring and temperature experiments begun last fall on juvenile chinook salmon were terminated. Cumulative mortality of Puget Sound stock was slightly higher in 1% area effluent than in Control river water at 100-F Area. Chemical toxicity of 3% reactor influent retarded growth. Temperatures anticipated for the Columbia River at future reactor levels (1 X) will probably not adversely affect local stock chinook salmon.

A new experiment clearly showed no mortality of all sockeye salmon or local stock chinook salmon fingerlings from area effluent concentrations up to 10%.

Biology Control Unit

Biological Monitoring

Feeding on contaminated insects and plants causes a regular increase in activity density with age in Canada geese reared on the HAPO project: 2×10^{-5} μc/g of eggshell, 1×10^{-4} μc/g of bone in two-day old goslings were typical values.

Rodents' thyroid activity densities increased during the month, with a mean of 0.01 μc I^{131}/g of tissue.

Fission product contamination in rabbit feces increased at all collection sites to an average of 2×10^{-4} μc/g.

Radiochemistry

Routine services consisted of preparation of 47 isotope solutions, analysis of 1100 beta emitting samples, 342 for tritium, and 109 for plutonium content. Special analyses were made on 13 sheep thyroid sections for I^{131} and group analyses for beta-emitting cations on some Chinook salmon fry, and Sr activity in whitefish.

Experimental Animal Farm

Toxicology of I^{131}

Metabolism of sheep fed I^{131}, as evidenced by thyroid radioiodine content, was slightly lower than was observed one year ago in comparable groups.

The uptake and retention of iodine in a single-shot experiment and in a 40-day feeding program were tested. The results agreed within expected limits of variation.

Metabolism

Plutonium Absorption and Metabolism

Skeletal deposition of plutonium in the pig closely resembled that in the rat. This important finding increases the probability of the validity of applying the extensive rat data directly to man.

Blood samples spiked with plutonium have been subjected to fractionization by the paper electrophoresis technique. Results have failed to show migration of plutonium with any particular protein fraction.

Tritium Absorption and Metabolism

Collagen formed during growth of rats is apparently not replaced to any considerable extent during the adult life of the animal; this was shown by tritium tracer experiments.

Retention of deuterium and tritium by Chlorella was followed in darkness and in light. Cells in photosynthesis preferentially eliminated deuterium (10% difference). Respiring cells, although eliminating twice as fast, handled the two isotopes identically.

Pharmacology and Experimental Therapeutics

One hundred mice and four larger animals were administered plutonium both intratracheally and intravenously in order to further study pulmonary turnover and control of bone deposition by Zr salts and EDTA.

Plant Nutrition and Microbiology

Absorption and Translocation of Radioelements in Plants

Nutrient culture experiments indicated that the dichromate ion is ten times more toxic than the chromic ion. This may be due to the fact that the uptake efficiency of Cr^{+6} is ten times or more than of Cr^{+3}. The addition of 0.01 μg Cr^{+6}/ml of solution appreciably reduced plant growth. Plant growth in soil is not affected by such small concentrations since the chromium is partially bound by the soil. However, administration of only 80 mg Cr^{+6}/ft^2 causes a delay of two to three days in barley germination. Barley grown in test plots watered with 100% effluent shows gross damage in this third year of such treatment. These studies require amplification because of the potential effects on irrigated crops in the environs.

Studies of the uptake of Sr^{90} from various local soils indicate that the strontium is incorporated into the plants four times as rapidly from sandy as from loam soils. The uptake is closely related to the size of the soil particles.

FINANCIAL DEPARTMENT MONTHLY REPORT
MAY, 1954

The Summary of Operating Programs for the Budget for FY 1956 and Revision of Budget for FY 1955 was submitted to the Atomic Energy Commission on May 5, under document numbers HW-31769 and HW-31770, to complete the formal transmittal of the budget for the fiscal year 1956. Subsequently, based on dollar limitations imposed by the Washington Office of the AEC on the Biology and Medicine Program, discussions were held with Radiological Sciences Department management, and reductions totaling $88,000 were agreed upon and furnished to HOO-AEC for inclusion in its formal submission of the budget.

Of the additional funds requested for 2000 Program Research and Development for FY 1954, assurance was received that $150,000 (approximately one-half of that originally requested) would be approved.

In connection with proposed community disposal legislation, considerable time was spent by General Cost personnel in compiling and furnishing data as requested, and in making special analyses.

A reduction of almost a third in the freight rate on one of Hanford's products and the consequent saving of approximately $7,000 a month in such charges, was accomplished by the SF Accountability Section after facilities and methods of both the shipper and the receiving agency were revised so that heavier minimum loads could be assured the carrier. In another area of activity, a proposal to have certain special type empty containers returned to Hanford for re-use was established as feasible and a saving of $25,000 a year is anticipated. Both of these economies became effective in May.

During May a decision was made to reduce the amount of the du Pont Annuity Fund by approximately $300,000. This fund, currently in the amount of approximately $2,219,000 (with securities valued at cost), was established in 1947 to be used in purchasing annuities for former du Pont employees who completed 15 years of combined service. The reduction is possible because of terminations of some employees who might have become eligible to receive annuities. The Treasury Services Division was requested to sell government bonds with face amount of $300,000, and to transmit the proceeds to Hanford Atomic Products Operation for deposit in the Contract bank account.

Further study has been given to the control and accountability of government-furnished material and equipment generated at GEL under the Assistance to Hanford Program. A procedure has been developed and agreed upon by all interested activities, including GEL and AEC, and is now being placed in effect.

Monthly depreciation expense increased from $5,935,000 last month to $6,291,000. The increase of $356,000 resulted primarily from increased production in the TBP and $BiPO_4$ plants.

The annual physical inventory of electrical and communication materials in the custody of the Electrical Distribution and Telephone Section was taken as of May 20, 1954.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the AEC during the month amounted to $90,300.

Appropriation requests approved during the month amounted to $221,469.

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 $6,850,000 and $6,900,000, respectively, by the Atomic Energy Commission) for the months of May and April, 1954, is shown below:

Disbursements	May	April
Payrolls (net)	$2 723 794	$3 200 453
Materials and Freight	1 594 320	1 851 799
Payroll Taxes	768 869	770 949
Payments to Subcontractors	541 075	611 613
United States Savings Bonds	190 308	217 529
Special Expenses for the Year 1953	151 620	-0-
Judgment in Lindell Case (guards)	95 193	-0-
Pension Plan - Employees' Portion	99 067	131 447
Travel Advances to Employees	72 536	68 095
Group Insurance Premium	-0-	132 353
All Other	204 422	91 359
Total	6 441 204	7 075 597
Receipts		
Rent	133 647	122 621
Electricity	81 324	45 792
Hospital	75 114	71 986
Sundry Accounts Receivable	62 371	8 833
Telephone	47 525	36 368
Refund of Travel Advances to Employees	12 572	10 975
Bus Fares	7 308	8 119
Sales to AEC Cost-type Contractors	6 570	3 726
Refunds from Vendors	4 364	1 636
Group Insurance Refund	-0-	50 000
Other	3 266	5 455
Total	434 061	365 511
Net Disbursements	$6 007 143	$6 710 086

Outstanding advances as of May 31, and April 30, 1954, were as follows:

	May	April
Cash in Bank - Contract Accounts	$3 273 481	$2 430 624
Cash in Bank - Salary Accounts	50 000	50 000
Total	$3 323 481	$2 480 624

AUDITS AND PROCEDURES SECTION
MONTHLY REPORT - MAY 1954

Internal Audit

Reports were issued for the following audits:

Source and Fissionable Materials Accountability - 100 Areas
Work Orders

Reports were being prepared for the following audits:

Cash Controls
Bank Account Reconciliations
Deposit Accounts
General Electric Suggestion Plan

The following audits, scheduled for May, were turned over to the General Electric traveling auditors who will perform them with the assistance of internal auditors:

Receiving and Inspection
Source and Fissionable Material Accountability - 200 Areas

At the end of the month, eight auditors were on full-time assignment and one auditor was on part-time assignment with the traveling auditors.

Accounting Procedures

No additional business graduates were added to the rolls in May, so we continued to have three engaged in the rotational training program. Two trainees are anticipated in June and two or three in July when graduates who have accepted General Electric's employment offers will report for work. As of this time, ten acceptances by graduates are firm and two requisitions remain open.

Assistance was furnished the SF Accountability Unit in an analysis of accountability controls in the TBP and UO_3 plants.

Administrative Planning

Considerable time was expended in May in writing a functional description for each position of unit head and higher. For section managers' positions, descriptions comparable to those in the functional charts for the Company's services divisions were composed. This service was at the request of and for the Salary Administration Section.

The revision of Organization and Policy Guide No. 01.1, describing the OPG system, was completed in May and required only final approval, after which several guides to be issued jointly by two department managers can be completed. Reviews are being made by the various departments to determine which guides should be the responsibility of each department manager.

We were informed that guides outlining functions and responsibilities for unit level positions will be prepared by June 21. This will require about 250 guides and these are being written by the various departments, with assistance from the Administrative Planning group.

Twenty-one OPG's were revised in May, most of which were required by organization changes, revisions of functions and responsibilities, and the redefinition of issuing authorities.

Notice was received during May that HAPO would in the future receive copies of KAPL Organization and Policy Guides.

One Office Letter indicating the fact that Memorial Day was a paid holiday was printed and distributed.

Reimbursement Accounting

While this group was engaged in the preparation of a number of special analyses and reports during May, none of these are considered significant enough to describe in this report. The greater part of the group's work involved normal reports and assignments.

COST AND BUDGETS SECTION
MONTHLY REPORT - MAY, 1954

The initial monthly report of financial activities for the preceding month was completed and submitted to the Manager - Finance during the latter part of May. The report included considerable historical and background detail as well as current information relative to product unit costs, work-in-process inventories, essential materials and graphite inventory as well as other items of current interest.

Transfer of budgeted funds for May and June, 1954 as well as for FY 1955 and FY 1956 was made in May to cover the reassignment of area janitor services from Plant Auxiliary Operations Department to the Manufacturing Department. Necessary cost codes and IME rates were established by Manufacturing Cost.

Consolidations and Budgets Unit

In addition to preparation of the consolidated report regarding funds for procurement of Equipment Not Included in Construction Projects, this unit now has been assigned the responsibility for allocation of equipment funds with subsequent reallocation as the need develops. All proposed reallocations are to be reviewed with personnel in Property Accounting Section for information regarding utilization, need for items and possible program changes.

Personnel estimates, by facility, formerly prepared by Administrative Practices personnel, will also be maintained by this unit in connection with preparation of Personnel Estimates PER-11 and PER-40 for HOO-AEC.

The form and security classification of the monthly Production Cost letter and bogey estimate were revised to provide necessary information with a minimum of detail.

Preliminary schedules regarding the required obligation of funds for FY 1955, to be used in preparation of supplemental agreement to the prime contract, have been completed with the assistance of other sections in the Financial Department.

Assistance was rendered the General Cost Unit in preparing a preliminary Consolidated Cost Report for the Employee and Public Relations Department. This report is designed to enable consolidation of the different activities incorporated in this department as well as to provide a maximum of important information with a minimum of detail.

Meetings were held with representatives of all Cost Units to discuss the revised IBM work order procedure recently submitted to the Accountants for review. Minor changes were recommended by the group and it is anticipated the program will be in effect by August 1, 1954.

Tentative closing schedule for each month in FY 1955 was completed and sent to the Accountants for comments.

Engineering Cost Unit

Discussions were held with Plant Accounting personnel to lay the groundwork for transfer to Construction Work in Progress, of all Major Equipment, Shop Equipment and Small Tools in the custody of Minor Construction.

As a result of overliquidation of North Richland Camp costs, the AEC has been able to refund $500,000 to Project costs. Of this amount, Project costs on GE books were credited with $47,000.

Discussions continued relative to relieving Engineering Department of responsibility for the 2101 Building and the Graphite stock. It is anticipated that transfer of the building to Manufacturing Department, and of the Graphite inventory to Stores Unit, PAO, will be accomplished in June.

General Cost Unit

Cost reports for the month of April for which the General Cost Unit is responsible, together with related cost analyses letters, were completed and distributed on dates scheduled. A consolidated report was designed this month for the manager of the Employee and Public Relations Department which will furnish him with a complete cost summary for the current month and year-to-date. This report will be submitted around June 10, 1954.

Considerable time was devoted this month to the revision of previously submitted budget estimates for the Community Program in order to bring them in line with those submitted to Congress. As a result of downward adjustments resulting from (1- elimination of nonincremental costs from charges for services by other departments, (2-inclusion of increased telephone revenue due to revised service rates, and (3-certain revisions in personnel, an over-all reduction in 7000 Program budgets of $119,000 was effected. The 7000 Program operating costs are expected to be within the Congressional budget estimates as a result of these revisions.

Revisions in budgets for FY 1955 made necessary by reason of reorganizations are progressing and are scheduled for completion by July 1, 1955. These will include budgets of Employee and Public Relations, Financial and Plant Auxiliary Operations Departments as well as certain administrative functions.

Manufacturing Cost Unit

An information meeting was held for all Manufacturing Cost Unit employees on May 26, 1954. The activities of the Metal Preparation Section were discussed. Charts were used in this discussion to provide employees with a better knowledge of the canning process, quality control and associated problems. During the month, tours of the 300 and 200 Area process buildings were arranged for a number of Manufacturing Cost Unit personnel. It is anticipated that all persons who have not previously toured these areas will have an opportunity to do so in the near future.

Continuing the planned program of interchange of information and knowledge, the Financial Analyst for the Reactor Section attended the Metal Preparation and Separations Section meetings on May 19. This was found to be very beneficial and will be extended to other supervisory personnel in future months.

Preliminary work was begun on a revised cost code structure which will conform with anticipated organizational changes in the Manufacturing Department to be made about July 1, 1954.

Metal Preparation Section landlord procedures were revised to be effective July 1, 1954. The revisions are associated with the pre-scheduled preventive maintenance program to be instituted in this Section. Improved cost control of building maintenance will be realized.

In the Reactor Section the following items were included in the month's activities.

1. The monthly inventory taken in Power and Operations was witnessed at 100-D Area, and Manufacturing Cost Unit personnel from the 700 Area witnessed monthly inventories taken at 100-B, C, F and H. Recommendations for improvements in storing and handling of the material at 100-D and 100-DR were made to the Operations Sub-Section. Reports are being prepared on the areas visited.

2. Assistance was given to the Plant Accounting Unit compiling data for use in a study of Plant investment per employee in the 100 Areas.

3. A rough draft of a procedure encompassing the use of expense codes for authorizing and recording maintenance cost in the Power and Operations Sub-Section was issued for review and comments.

Assistance was given the Separations Section Plant Engineering Unit in the preparation of tables showing quantities of steam used and amounts of steam billed to landlord. Purpose of the study was to arrive at a more equitable distribution of steam to the landlord.

The operating budget for Fiscal Year 1955 and 1956 was distributed. Work on the revision of the FY 1955 budget was not started as changes were not received. This delay in receiving changes will result in considerable burden to obtain revised budget figures for the July, 1954 operating report.

Effective May 3, 1954 copies of all purchase orders are routed through the Manufacturing Cost Unit. This is proving to be of considerable help in re-estimating work orders and obtaining supplements prior to the time the work orders are overrun. In addition, it provides an opportunity to locate possible capital items charged to overhead accounts. Approximately 2,100 purchase orders were reviewed during the month.

A chronological listing of Manufacturing Cost forecasts issued monthly during Fiscal Year 1954 was prepared. Comparisons of Fiscal Year 1954 total Manufacturing cost included in these forecasts indicate a variance of less than 2% from the annual forecast prepared in July, 1953.

A new Standard Cost Report form for Operations and Power Units of Reactor Section was used in May to report April costs. This form includes Fiscal Year-to-Date variance between Standard and actual costs reported in both dollars and per cent. Considerable time was spent in arriving at this variance as prior reports contained only current month variance by unit.

GENERAL AND PERSONNEL ACCOUNTING SECTION
MONTHLY REPORT - MAY, 1954

NARRATIVE REPORT

General Books Unit

Unexpended advances from the Atomic Energy Commission totaled $3,323,481 at May 31, 1954, as compared with $2,480,624 at the end of April. Additional advances during June, in the amount of $5,075,000, were requested to cover June expenditures. Unexpended advances will be reduced to $2,500,000 in June in accordance with a request by the Commission.

Particular attention was given this month to simplifying material presented in the report of Commitments and Expenditures. A revised report for the HAPO General Financial Statements was developed which will be included in May statements.

Preparations were begun for adjustments of the accounts as of June 30, 1954, the close of the fiscal year, and for the issuance of year-end reports.

An up-to-date chart of General Ledger accounts was issued May 1, 1954, to assist Financial Department personnel in the preparation of journal entries and cost vouchers.

Activity in connection with the handling and control of shipping documents issued by the Atomic Energy Commission covering off-site shipments was heavy in May. One hundred and seventy documents were processed during May compared with a normal month of approximately one hundred documents; total dollar value of material and equipment shipped was $835,000. Accelerated off-site shipments of excess materials and equipment in preparation for the annual physical inventory caused the heavy work load this month.

During May 344 travel and living expense reports totaling $67,492 were processed as compared with 330 reports in April totaling $53,857. Total charges for Travel and Living Expense Variation and Conference Expenses are shown below:

	May	April
Travel and Living Expense Variation	$1 515	$1 575
Conference Expenses	132 Cr.	2 295
Total charges to overhead allowance	$1 383	$3 870

A new travel and living expense report form (A-986-FS) was put into use during May, and a pocket "Expense Account Record" form (A-75-DS) was provided for the convenience of employees.

During May 10,915 remittances totaling $429,017 were handled by the Works Cashier"s office.

Accounts Payable Unit

During May an audit of Accounts Payable was made by representatives of the General Electric Traveling Auditing Staff. In addition to a detail audit of all vouchers recorded for the month of March,1954, a general review was made relative to methods, procedures, and functions of the Accounts Payable Unit.

Volume of work processed in Accounts Payable during the month remained at a high level; 4327 vouchers amounting to $3,590,677 were recorded during May. Cash discount earned during May amounted to $4,713, and for the fiscal year to date $45,001.

There was a substantial decrease during May in the Deposit Account-Returnable Containers; the balance as of May 31 was $28,475 as compared to the April 30 balance of $32,491.

Active contracts handled by Accounts Payable, excluding requirement, numbered 26 and open contract commitments at the end of May amounted to $1,683,956. Payment on these contracts in May totaled $59,649 for work performed during the month. Disbursements relative to requirements contracts for the month amounted to $479,447.

Outstanding HAPO commitments on construction projects amounted to $4,991,262 at the end of May.

Accounts Receivable Unit

Gross accounts receivable balances were reduced $9,197 during the month. Details of the decreases and increases are shown below:

Decreases:	
Hospital	$10 175
Electricity	9 985
Sundry (principally tenant services)	7 108
Rent	945
Others	559
Total decrease	28 772
Increases:	
AEC cost-type contractors	15 156
Telephone	4 419
Total increase	19 575
Net decrease	$ 9 197

Invoices, in the amount of $25,326 each, were issued to the Northern Pacific Railroad Company and the Union Pacific Railroad Company for the fourth (of twenty-five) annual payments for the southern railway connection out of Richland. Payments of both invoices were received May 17, 1954.

May telephone billings reflected increased rental rates effective May 1, 1954. The increased rate schedule affected all residential and business telephone subscribers, and will provide an annual telephone revenue increase of approximately $30,000, or 11 percent.

Personnel Accounting Unit

Traveling auditors from the Auditing Services Department audited Federal and State payroll tax reports for 1953, and completed an audit of non-exempt payroll.

Listings of employees, by five-year service levels, were furnished to the Employee Relations Section of the Employee and Public Relations Department for use in distribution of Service Awards under the Service Recognition Plan.

The Payroll Services Section, Schenectady, was furnished with comparative statistics concerning employees on the payroll and employees off the payroll for lack of work as of May 31, 1953 and 1954.

The following arrangements were completed with respect to the proposed general salary increase, to be effective June 10, 1954:

a. Preliminary new rate schedules of job and preferential rates for all nonexempt jobs were prepared.

b. Joint plans were made with the Computing and Procedures Units for the change-over in rates.

The status of calculations of retroactive payments of overtime premium in the Community Firemen cases was as follows:

a. The calculations of the Porter case were completed and necessary documents furnished the attorneys on May 21.

b. The calculations of the Canfield case were completed.

c. The calculations of the Rivers case were about 25% completed.

Overtime premium payments to Two Platoon Firemen for the period from April 26 through May 9 were paid to all active firemen in their May 28 salary checks.

The Spring Salary Review for exempt employees was completed during the month.

The following Reimbursement Authorizations were received during the month of May:

R.A. No.	Subject
224	Revision of R.A. No. 64 - Classification of Chief Operators (Reactor and Separations).
225	Revision of R.A. No. 63 - Additional Classification of Radiation Monitor-Journeyman, Radiation Monitor, and Radiation Monitor-Trainee.

Office Letter No. 197, issued May 21 on the subject "Memorial Day," covered instructions on the time card schedule for the week ended May 30 and weekly salary check distribution for that week.

Round table discussions were held by supervisors with all nonexempt employees during May.

STATISTICS

General Books Unit

	May	April
Travel Advance Account		
Cash Advances - Beginning of Month	$91 105	$87 842
Advances During the Month	72 536	68 095
Expense Accounts Submitted	67 492 Cr.	53 857 Cr.
Adjustments	662 Cr.	-0-
Cash Refunded	12 572 Cr.	10 975 Cr.
Cash Advances - End of Month	$82 915	$91 105
Outstanding Travel Advances		
Current	$72 026	$81 134
Over 30 Days	10 889	9 971
Total	$82 915	$91 105
Travel and Living Expenses		
Actual Expenses	$65 980	$52 669
Billed to Government	64 589	48 765
Balance in Variation Account at End of Month	5 286 Dr.	3 904 Dr.

Accounts Payable Unit

Accounts Payable Balance - Beginning of Month	$ 509 047	$ 673 416
Vouchers Entered During Month	3 590 677	3 491 610
Vouchers Paid During Month	3 527 101 Dr.	3 657 615 Dr.
Cash Receipts	4 364	1 636
Accounts Payable Balance End of Month	$ 576 987	$ 509 047
Number of Vouchers Recorded	4 327	4 743
Number of Checks Issued	2 987	2 901
Number of Freight Bills Paid	1 546	1 407
Amount of Freight Bills Paid	$ 385 537	$ 327 067
Number of Purchase Orders Received	2 370	2 694
Amount of Purchase Orders Received	$1 867 356	$1 798 760

Accounts Receivable Unit

Account	Balance 4-30-54	Net Charges	Collections	Balance 5-31-54	Number of Bills Issued During Month
Hospital:					
Active	$129 552	$ 69 046	$ 79 891	$118 707	1 640
Collection Agency (61 Accounts)	9 198	788	118	9 868	
Electricity	51 251	71 718	81 703	41 266	3 853
Telephone	31 424	53 043	48 624	35 843	6 343

12 | 70 | 3

Account (Continued)	Balance 4-30-54	Net Charges	Collections	Balance 5-31-54	Number of Bills Issued During Month
Sundry:					
Active	37 165	54 476	62 469	29 172	435
Collection Agency (114 Accounts)*	4 477	895	10	5 362	
Rent	28 232	400 181	401 126	27 287	6 885
Equipment Sales to Facilities (2 Accounts)	26 175		349	25 826	
Cost-Type Contractors	8 916	21 727	6 569	24 072	56
Safety Shoes	1 561	1 959	2 142	1 378	267
Loans to Employees (4 accounts)	697		27	670	
Sub-Total	$328 648	$673 833	$683 028	$319 451	19 479
Reserve for Bad Debts	25 898 Cr.			26 468 Cr.	
General Ledger Balance	$302 750			$292 983	

* Includes all utility and rental accounts at collection agencies.

Personnel Accounting Unit

Number of Employees Changes During Month	Total	Monthly Payroll	Weekly Payroll
Employees on Payroll at beinning of month	8 594	2 315	6 279
Additions and transfers in	80	5	75
Removals and transfers out	(69)	(14)	(55)
Transfers from weekly to monthly payroll		5	(5)
Transfers from monthly to weekly payroll		(3)	3
Employees on payroll at end of month	8 605	2 308	6 297

Overtime Payments During Month	May Number	May Amount	April Number	April Amount
Weekly-Paid Employees	5 421	$ 79 145-a)	7 046	$109 657-b)
Monthly-Paid Employees	375	24 734	430	34 947
Total	5 796	$103 879	7 476	$144 604

Number of Changes in Salary Rates and Job Classifications	May	April
Temporary changes	71	101
Retroactive changes	3	4
Normal changes	669	1 138
Total	743	1 243

(a-May payments to weekly paid employees are for four week periods.
(b-April payments to weekly paid employees are for five week periods.

Gross Payroll Paid During Month	May	April
Engineering	$ 783 564	$ 839 973
Manufacturing	1 652 347	1 942 500
Plant Auxiliary Operations	813 779	988 180
Other	685 628	780 548
Total	$3 935 318-a)	$4 551 201-b)

(a-May payments to weekly paid employees are for four week periods.
(b-April payments to weekly paid employees are for five week periods.

Employee Benefit Plans Participation in Benefit Plans at Month End	Number Participating May	 April	Percent Participation May	 April
Pension Plan	7 924	7 909	97.7%	97.6%
Insurance Plan				
Personal Coverage	8 519	8 507	99.0	99.0
Dependent Coverage	5 949	5 920	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 242	4 218	49.3	49.1
Savings Plan	1 109	1 115	12.9	13.0
Both Plans	4 845	4 828	56.3	56.2

Pension Plan	May	April
Number Retired	8	2
Number who became eligible for participation	44	46
Number who applied for participation	43	44
Number who elected not to participate	1	1
Replies not received	0	1

Insurance Plan - Number of Claim Payments		
Employee Life Insurance	1	4
Employee Accident & Health Insurance	499	491
Dependent Accident & Health Insurance	513	422
Total	1 013	917

Good Neighbor Fund		
Number Participating	5 715	5 694
Percent of Participation	66.4%	66.3%
Suggestion Awards		
Number of Awards	2	43
Total amount of Awards	$ 735	$1 040
Preferential Rates		
Number (eliminated) or added	(5)	(11)
Number Currently in Effect	615	620
Number of Military Allowance Payments		
Number	2	1

Number of Payroll Deductions - Other than Taxes	May	April
Barracks Rent	15	17
Dormitory Rent	520	530
Good Neighbor Fund	9 696	9 627
Hospital	505	638
House Rent	5 112	5 107
Insurance	8 504	6 272
Pension	24 400-a)	24 300-a)
Safety Shoes	450	624
Savings Bonds	15 043	14 903
Trailer Space	144	153
Union Dues	1 847	1 782
Other	163	165
Total	66 399	64 118

(a-Approximate numbers.

PROPERTY ACCOUNTING SECTION
MONTHLY REPORT -- MAY 1954

Plant Accounting Unit

Major increases in completed plant resulted from closing project costs from Construction Work in Progress as follows:

CG-438	Ball Third Safety Program	$232,532
CG-538	Redox Waste Line to 241-U Tank Farm	377,513
C-431	New Production Facility - 100-C Area	215,907

Unitization has been completed for CG-438.

Monthly depreciation expense increased from $5,935,000 last month to $6,291,000. The increase of $356,000 resulted primarily from increased production in the TBP and $BiPO_4$ plants. A credit of $50,652 was distributed as a FY to date adjustment to depreciation expense. This amount was received from Northern Pacific and Union Pacific railroads, representing their rental or usage of trackage serving the Hanford area.

AEC has requested that all projects in Construction Work in Progress and in use at June 30, 1954, be closed to completed plant. They have further requested that the Unclassified Property account reflect a zero balance at June 30, 1954, and if necessary, that costs be distributed to classified accounts on an estimated basis.

Kaiser Engineers agreed to furnish one engineer and one financial representative to assist in unitization of KE, KW and 2101 graphite fabrication facilities. It is expected that unitization of 2101 graphite fabrication facilities will be completed by June 30, 1954, and the KE and KW Areas by June 30, 1955.

Plant Accounting Unit (Continued)

Plant and equipment balances at May 31, 1954, are:

	(In Thousands) ASSET	RESERVE	NET
Completed Plant and Equipment	$721,228	$270,724	$450,504
Construction Work in Progress	29,947	-0-	29,947
Total Costs Recorded (G.E. Books)	$751,175	$270,724	$480,451
AEC and Other Contractor Costs			
Land and Land Rights	$ 5,239		$ 5,239
Construction Work in Progress	149,330		149,330
Total	$905,744	$270,724	$635,020

The addition of a Business Graduate increased total personnel to 30 non-exempt and 6 exempt, aggregating 36.

Inventory Accounting Unit

Preliminary results of the annual physical inventory of essential materials (excluding coal) which was taken as of April 30, 1954, indicate a net shortage of $32,000. The physical inventory of these materials at February 28, 1953, showed an overage of $92,000. Although work is still underway to determine reasons for the current shortage, it appears that the variance is due mostly to the methods employed in valuing materials consumed. Report covering final results of this inventory is expected to be issued some time in June 1954.

The annual physical inventory of electrical and communication materials in the custody of the Electrical Distribution and Telephone Section was taken as scheduled as of May 20, 1954. Tentative results of this inventory, exclusive of the value of materials on service trucks which are to be inventoried at a later date, are summarized below:

	Electrical Materials	Communication Materials	Total
Physical Inventory	$ 65,575-a)	$ 19,985	$ 85,560
Adjusted General Ledger Balance	59,500	14,865	74,365
Net Overage	$ 6,075	$ 5,120	$ 11,195

a)-Includes the following:

Materials currently booked as spare parts inventory items which should be classified and booked as general supplies inventory items.	$ 52,550
Unrecorded materials classified as shop stocks	$ 2,407
Items of a capital nature which should be booked in plant accounts	$ 5,955

An extensive review is being made to determine reasons for the overage.

Inventory Accounting Unit (Continued)

During the month final arrangements were made with Stores Unit for taking the physical inventory of excess materials and equipment as of June 2, 1954. This work included a series of meetings throughout the month with key personnel of the Stores Unit in formulating procedures, establishing time schedules and procuring the necessary manpower for taking the physical inventory.

Policy during the past year with respect to the valuation of materials and equipment declared excess and withdrawn from excess provided that excess property be valued on a condition code ranging from 5 to 40 percent of acquisition value of items declared excess and 10 to 60 percent of acquisition value of items withdrawn from excess. Decision was made during the month that, effective June 1, 1954, all items going into excess, as well as items withdrawn from excess (exclusive of salvage and scrap items) for project use only, would be valued at 20 percent of acquisition cost, regardless of condition.

Following is a summary showing inventory account balances for the months of April and May, 1954, together with the amount of change:

(In Thousands)	Book Balance 4/30/54	Book Balance 5/31/54	Increase (Decrease)
Current Inventories			
General Supplies	$ 916	$ 976	$ 60
Fuel and Lubricants	80	71	(9)
Essential Materials	3,449	3,404	(45)
Total Current Inventories	$ 4,445	$ 4,451	$ 6
Special Materials	$ 325	$ 357	$ 32
Spare Parts	2,538	2,578	40
Excess Materials	1,786	1,356	(430)
Total Inventories - Gross	$ 9,094	$ 8,742	$ (352)
Less: Spare Parts Inventory Reserve	$ (521)	$ (485)	$ (36)
Excess Inventory Reserve	(1,884)	(1,355)	(529)
Total Reserve	$ (2,405)	$ (1,840)	$ (565)
Total Inventories - Net	$ 6,689	$ 6,902	$ 213
As a Memo:			
Spare Equipment Held in Storage	$ 1,552	$ 1,609	$ 57
Excess Equipment	2,077	2,128	51
Excess Equipment Reserve	(2,053)	(2,111)	58

The decrease of $352,000 in gross value of inventories during the month below the value at the end of the previous month is primarily due to off-site shipments of excess materials.

Organization and personnel at May 31, 1954, remained the same as at April 30, 1954. The number of employees on the payroll was 11 (4 exempt and 7 non-exempt).

Property Management Unit

The closeout of the 2101 Building brings into focus the need for advance planning and policy decisions in regard to the retention of certain expensive tools, jigs, fixtures and other equipment that will be available for excess by Kaiser in the

Property Management Unit (Continued)

near future in connection with their completion of certain phases of work in the K Areas. In preliminary discussions, the Engineering Department has agreed to prepare a list of the items involved and to obtain necessary policy decisions as to whether such items shall be stored and held for possible future construction use.

Further study has been given to the control and accountability of government-furnished material and equipment generated at GEL under the Assistance to Hanford Program. A procedure has been developed and agreed upon by all interested activities, including GEL and AEC, and is now being placed in effect. This procedure should eliminate the difficulties and criticism encountered in the past.

One hundred eighty two (182) Property Disposal Requests have been investigated and processed since 1 March 1954. Efforts have been concentrated on promoting and assisting departments to clean up their areas of accumulated materials, equipment and scrap. The extent of this program may be visualized by noting that one area had sixty-five truck loads of material; one covered nineteen miles of transmission line; and one covered miscellaneous parts in excess of $100,000.

Approximately $6,000 in electronic equipment which was excess to the needs of Building 234-5 was placed with the Pile Technology Sub-Section to supply their need for component parts, thereby avoiding new acquisition. Other potential users are being canvassed in an effort to place an additional $15,000-$20,000 where it will find use.

Appropriation requests approved during the month amounted to $221,469.

Appropriations Unit

Project proposals and informal requests which were processed by the Appropriations Unit and directives issued by the Commission during the month of May are shown in the following list:

CG-558 - Reactor Plant Modification for Increased Production

Letter dated May 7, D. F. Shaw to W. E. Johnson, authorized GE to proceed with improvements to existing pumps in 181-B and 181-D for export water to Purex under work authority for Project CA-513. All costs are to be transferred to Project CG-558 upon authorization.

Work authority dated May 26 increased GE funds to $515,000 for continuation of design and procurement of horizontal rods. The Commission has not yet authorized funds for the full scope.

CA-546 - Fuel Element Pilot Plant

Letter dated May 18, A. B. Greninger to J. I. Thomas, stated this project, exclusive of procurement and installation of equipment for a semiworks production line, could be provided for $1,600,000. This letter provided an estimate to the Commission which enabled them to proceed with the award of a lump sum contract. Directive dated May 26 authorized AEC $1,600,000 as an interim authorization pending receipt of revised proposal including the semiworks phase.

Appropriations Unit (Continued)

CA-431-C - New Reactor - 100-C Plant, Metal Examination Facility, 105-C Building

Proposal approved by the Commission February 27, 1953, requested $375,000 to design, procure, fabricate and install equipment for the purpose of examining irradiated uranium slugs in the storage basin addition of Building 105-C. This equipment will provide detailed engineering information from approximately 120 jacketed slugs and approximately 25 de-canned slugs per day. May 5, 1954, the Commission authorized an additional $125,000 (making a total of $500,000) for painting the basin, additional cartridges and buckets and revision to existing monorail system.

CA-533 - Hanford Works Official Telephone Exchange

Work authority dated April 16, 1953, authorized GE $20,000 for scoping, preliminary design and miscellaneous services. Revised proposal requesting over-all funds of $480,000 (GE $64,000) and authorization to proceed with construction of the facility was approved by the A & B Committee April 27, 1954, and forwarded to AEC. Directive dated May 21 authorized AEC $480,000.

CG-583 - Moisture Monitoring System for Detection of Leaking Process Tubes - 100-B, D, DR, F and H Areas

Proposal requesting $293,000 for design, fabrication and installation of moisture monitoring equipment in the 105 Buildings of B, D, DR, F and H Areas to detect automatically, record, and signal the presence of water in the reactor gas system was approved by the A & B Committee April 12, 1954. Directive dated May 5 authorized GE $293,000.

CG-587 - TBP Waste Scavenging

A project proposal providing for the scavenging and cribbing of a large volume of TBP wastes is in preparation. Design authorization requesting $10,000 for completion of the proposal and initiation of detailed design was approved by the AEC May 26. Total estimated project cost is $225,000.

CG-588 - Ammonia Scrubbers, Redox

A project proposal providing for ammonia scrubbing equipment in the Redox plant for the purpose of minimizing the omission of contaminated ammonia nitrate particles from the stack is in preparation. Design authorization requesting $10,000 for preparation of project proposal and initiation of detailed design was approved by the AEC May 19. Estimated total cost is $175,000.

SF ACCOUNTABILITY SECTION
MONTHLY REPORT -- MAY, 1954

Revision of the Normal Uranium Report and SF Accounting procedure was completed during May for application as of June 1. The revision was required due to process changes and the scope of the revision includes the entire plant due to the relationships established by process flow.

Liquidation of inactive status items received considerable attention with the initiation of one major item and marked progress on two others. The value of material currently in liquidation amounts to approximately $170,000.00, with completion scheduled for July 30, 1954. Further progress on an additional item involving $185,000.00 equivalent value is waiting on AEC action, the HAPO portions of the problem having been accomplished. A third item has potential technical value and research interests are being canvassed prior to recovery.

During the month a survey of recovery operations was completed as a test of verification of items officially listed as "Scrap Awaiting Recovery." Conclusions drawn from the data indicate a very satisfactory control, particularly in view of the diverse nature of the material and the measurement limitations associated therewith. The survey showed that for all operations, recovery amounted to 98.2%, with more recent data indicating even higher percentages. General improvement in off-site processing was also reported relative to HAPO generated material and the current trend is in the direction of adequate recovery levels.

Better utilization of side stream materials received consideration and one item of high unit cost is now being considered for reprocessing locally at an appreciable reduction in cost over a previously suggested flow. Among the expense items which are to be eliminated are: courier escort, transportation, and preparation.

Investigations for improvement of accounting controls were conducted, with particular consideration of the effect of cyclic operation in which the time cycle fails to coincide with the reporting period. This is a common problem to monetary accounting but is further complicated in material control in that much of the material involved is prior to the first or initial measurement point. As originally encountered the problem presented is one of lack of source data. The solution is provided by establishment of a method of calculation capable of reliability evaluation. Some progress has been made on the devising of such systems which require trial prior to application.

Methods were devised whereby new and favorable freight rates were made applicable relative to one product of major activity. Approximately $7,000.00 per month savings were effected. In addition, the return of empty containers for reuse was established as feasible and is now saving more than $25,000.00 per year. Both of these economies became effective in May, 1954.

An appreciable increase in measurement method evaluation data has provided much better unification or evaluation of inventory reliability.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION
MAY 1954

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning of month	373	337
Additions and transfers in	4	44
Removals and transfers out	(8)	(8)
Employees at end of month	369	373
Personnel by Unit at Month-End		
General	7	7
Audits and Procedures Section		
Accounting Procedures	1	1
Administrative Planning	2	2
Internal Audit Unit	15	15
Reimbursement Accounting	3	3
	21	21
Cost and Budgets Section		
Consolidations and Budgets Unit	7	7
Engineering Cost Unit		
General	6	7
Design Section Costs	7	7
Project Section Costs	17	18
Technical Section Costs	10	10
General Cost Unit		
General	1	2
Community Operations and Real Estate	8	7
Medical	3	3
Plant Auxiliary Operations	17	17
Radiological Sciences and others	7	7
Manufacturing Cost Unit *		
General	2	2
Analysts	10	11
Budgets and Control	16	16
Records and Reports	14	14
	125	128
General and Personnel Accounting Section		
Accounts Payable Unit	33	32
Accounts Receivable Unit	22	23
General Books Unit	19	19
Personnel Accounting Unit		
General	2	2
Confidential Payroll Records	7	7
Employee Benefit Plans and Payroll Reports	19	19
IBM Procedures	1	1
Preparation and Employee Records	28	29
	131	132

	Current Month	Prior Month	
Property Accounting Section			
Appropriations Unit	5	4	
Inventory Accounting Unit	11	11	
Plant Accounting Unit	36	35	
Property Management Unit	3	3	**
Work Review Committee	2	2	
	57	55	
SF Accountability Section			
Measurements Methods Unit	5	6	
Process Flow Unit	2	2	
SF Accounting Unit	4	5	
SF Records and Reports Unit	14	14	
	25	27	
Rotational Trainees	3	3	
	369	373	

* Figures for April recast on revised basis.

** Figure shown on April report (5) revised to separate Property Management Unit and Work Review Committee.

PLANT PROTECTION SECTION

MONTHLY REPORT - MAY 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	62	98	36 (a)	
Security and Patrol	500	499		1 (b)
Fire Protection	137	137		
Office Unit (Laundries, Clerical and Records Control)	300	190 *		110 (c)
TOTALS	1,001	926	36	111

NET DECREASE: 75

(a) - Administration Area Maintenance

1 - New Hire
39 - Transferred in
4 - Transferred out

(b) - Security and Patrol

1 - Rehire
1 - Reactivated
1 - Transferred in
1 - Transferred out
2 - Deactivated
1 - Termination

(c) - Laundries

3 - New Hires
1 - Reactivated
1 - Deactivated
1 - Transferred out

Clerical Services

2 - New Hires
1 - Termination

*All Janitor Service personnel transferred out of Office Unit on May 17, 1954.

FIRE PROTECTION UNIT

There were nine minor fires experienced by HAPO during the month with losses estimated ± $45.00.

On May 16, 1954, a fire in one wing of the Blaw-Knox (construction) administration building resulted in damage of approximately $90,000. The fire originated in a janitor's closet, presumably from spontaneous ignition of oil mops.

Drills Held During May

Outside drills held	109
Inside drills held	118
Total	227

Fire department officers held 26 classes on the method of artificial respiration at which a total of 391 employees of various departments attended.

Fire department officers held three classes on the use and care of the Chemox Mask at which 56 employees of various departments attended.

Two fire trucks were given annual tests during May.

Ten thousand feet of fire hose in hose boxes in the areas was tested during the month.

Fire Extinguishers

Inspected	1,932
Installed or relocated	10
Tested	802
Delivered to new locations	7
Seals broken and not reported	43
Serviced	664
Weighed	547

Gas Masks

Inspected	82
Serviced	13

OFFICE UNIT

Laundries

200-West Laundry	April	May
Pounds Delivered	235,788	247,803
Pounds Rewashed	17,054	14,084
Total Dry Weight	252,842	261,887

200-West Laundry - Monitoring Section	April	May
Poppy Check - Pieces	228,303	222,445
Scaler Check - Pieces	352,703	319,647
Total Pieces	581,006	542,092

700 Area Laundry

Flatwork - pounds	35,421	39,528
Rough Dry - pounds	40,276	54,204
Finished - pounds	2,725	2,522
Total Weight	78,422	96,254
Estimated Pieces	102,732	126,092

Clerical Services

Mr. Clarence Little, Atomic Energy Commission, Washington, D.C., inspected the Printing and Duplicating facilities at Hanford this month to check compliance with government regulations applicable to these operations. His informal reports indicated his approval of present operating policies.

The fire in Blaw Knox construction offices in 200-East Area on May 16 necessitated the implementing of emergency procedures to provide office equipment and machines for temporary offices in 3000 Area.

Central Mail and Addressograph

Inter-office mail increased the past month, due partially to the increase in Organization and Policy Guides with a total of twenty-five issued during May.

Outgoing postal, registered and insured mail showed a slight decrease compared to previous months.

A special mailing was completed for the Richland Community Council which included stamping their return on the envelope, stuffing with a booklet and stamping for postal mailing to the residents in Richland.

Types and Pieces of Mail Handled	May	April
Internal	3,326,071	2,609,761
Postal	90,092	95,678
Special	1,994	2,467
	3,418,157	2,707,906
Total postage used:	$3,520.10	$4,102.67
Total teletypes handled:	2,904	3,865
Total store orders handled:	847	1,065

Addressograph	MAY		APRIL	
Type of List	Number of Runs	Total Copies	Number of Runs	Total Copies
Plant name list	113	159,398	113	158,414
Housing list	26	63,250	18	80,041
Payroll list	14	29,855	9	28,642
Total new plates		2,643		2,485
Total corrected plates		4,421		3,132
		7,064		5,617

Office Equipment - Furniture

Requisitions for additional equipment to furnish offices, assignment, and lunch rooms for new Transportation facilities were prepared and forwarded to Purchasing.

A Request for Appropriation for additional material required for 100-K Project has been approved and requisitions were issued to purchase equipment and furniture.

Due to a fire in 200-E construction administration building, available office furniture in stock was used to fill Blaw-Knox requirements to set up offices in 3000 Area. A sufficient quantity of equipment was on hand to temporarily supply their immediate needs. The costs incurred in moving material will be charged back to AEC Project.

Approximately 75 desks were returned from Blaw-Knox which were damaged by water and fire. It is estimated that 50% of these items will not be economical to rehabilitate and the balance will be salvaged. The rehabilitation cost will be charged back to AEC Project.

Operations Office Equipment Budget for FY 1955 was reviewed with representatives of AEC to determine the minimum amount of dollars required to adequately operate during the FY. A 60% reduction was feasible by reducing unit cost to the actual value of surplus materials that would be transferred from other agencies instead of using current market acquisition costs.

Activity in office furniture during the month was as follows:

Item	Received by Credit S.O.	Issued	Salvaged
Blackboard	0	0	0
Bookcase	6	5	0
Chair	179	372	69
Costumer	5	28	2
Card File	1	2	1
Cabinet	60	131	9
Desk	75	174	3
Table	41	74	2
Miscellaneous	77	134	4

Office Machines

Two portable dictating machines were purchased. These machines will be assigned to Office Equipment and issued on a temporary memorandum to those employees requiring dictating equipment while on company business away from Hanford.

A demonstration of the new Remington Rand Printing Calculator was given to a group of General Electric and AEC Financial employees. The new 54 models of National Cash Register full live keyboard adder, Monroe 10 key and Friden 10 key adders were displayed by representatives of respective companies.

Office Machine Repair

The repair shop in the 200-E Blaw-Knox administration building was discontinued on May 21 because of fire in this building on May 16. Due to this fire fifty-eight machines were damaged by fire and water. Of the fifty-eight machines, six were a total loss.

A representative of the Remington Rand Company spent two days in the Shop giving special instruction on electric typewriters.

Special work was started this month by the Instrument group. The 706 Bio-Assay Lab is moving to their new location. This called for the moving of all electronic equipment maintained by the Instrument group from the 706 Building to the 722-C Building for a complete overhaul before being installed in the new building.

Central Printing

Considerable work interruption in Central Printing was caused during the installation of new sinks, general painting and floor laying in the photographic dark room and offset plate making room. All remodeling work is now completed and production is back to normal.

GE organization charts were printed on a priority basis for Salary Administration during May. After many changes in copy and chart arrangement, the job was completed to meet a tight deadline.

Work Completed	May	April
Orders received	372	398
Orders completed	300	386
Back log	76	63
Copies printed	1,064,904	1,120,223
Negatives masked	668	1,284
Negatives processed	700	1,323
Photo copy prepared	140	253
Litho plates processed	813	1,288

Stenographic Services

Two new stenographers were assigned to the Stenographic Pool in May. There was one termination and no transfers. In anticipation of influx of 1954 graduates in June, arrangements have been completed for five transfers to become effective early in June.

Loan requests continued heavy throughout the month, however, due to the heavy work load in the Pool, only nine requests could be filled. Work assignments were completed against forty-six cost codes for seventy-two people.

A hundred page dittoed inventory was completed for Minor Construction, approximately fifty-five pages of duplimat masters were typed for Reactor Section, and forty-six hours were consumed typing duplimat masters for Project Section. Many offices temporarily without stenographic help sent smaller rush assignments to the Pool.

Breakdown of Hours	May	April
Dictation and transcription	3.0	2.5
Machine transcription	55.0	102.5
Letters	19.0	37
Rough drafts	91.0	99.5
Ditto, stencils, duplimats & Xerography	431.0	374.5
Miscellaneous	372.0	257.5
Training time	102.5	237.5
Meeting time	11.0	10.5
Unassigned time	27.0	16
Absentee time	4.0	18
	1,115.5	1,155.5
Employees on loan to other units	816.5	1,184
Total	1,932.0	2,339.5

Area Mail and Duplicating

Effective May 17, Duplicating in 703 Building began operating on a one shift basis. The elimination of swing shift at this location will make possible an annual saving of $4,058.32 due to the fact that the work force has been reduced from ten to nine employee, and payment of shift differential has been eliminated. To date, the daily number of orders on hand has been kept to a minimum, and all requests for priority duplicating handled without difficulty.

A Reproduction AA Leader has been assigned the responsibility of directing duplicating work in 300, 100-H and 200-West areas. It is believed that this step will provide closer direction of work in the three locations named, as well as assure a consistently high level of service during the peak vacation period, and when absences occur.

Machine backstripping equipment recently installed in the 300 Area duplicating office is now being used to bind reports prepared and duplicated in other areas. As an example, a report prepared for Radiological Sciences was duplicated by Central Duplicating, then sent to 300 Area for assembly, checking, stapling and binding. This permits full utilization of the equipment, and saves man hours which would be required to do this work by hand elsewhere.

Duplicating and Mail Statistics	May	April
Orders received	3,047	3,346
Orders completed	3,000	3,406
Orders on hand	42	53
Offset plates	17,497	19,349
Offset copies	850,010	970,585
Stencils	1,064	139
Stencil copies	75,574	2,075
Ditto masters	491	573
Ditto copies	11,284	12,224
Verifax masters	1,362	2,227
Verifax copies	3,206	5,763
Xerox plates	1,320	1,328
Internal Mail	485,981	539,342

Records Control

Quantity of records received, processed and stored:

Employee and Public Relations Department	45	Standard	Storage	Cartons
Engineering Department	73	"	"	"
Financial Department	113	"	"	"
Manufacturing Department	8	"	"	"
Plant Auxiliary Operations Department	49	"	"	"
Radiological Sciences Department	17	"	"	"
Sub-Contractors				
Charles T. Main Inc.	9	"	"	"
Vitro Corporation	5	"	"	"
TOTAL	319	Standard	Storage	Cartons

Persons provided records service: 1,150

Cartons of records destroyed: 180

Records Cartons issued: 290

Percentage of Records Service Center vault (exclusive of North Richland) occupied by records is 84.3%.

Sixteen requests for file cabinets received. Ten requests were filled, 12 requests were cancelled. No requests are pending. Two fireproof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a saving of $300.00 ($225.00 cost of conbination locked cabinet minus $75.00 cost of key locked cabinet equals $150.00 saving per cabinet exchanged). Eight key locked cabinets were picked up with no exchange and returned to stock for reissue.

Ten "Requests for Authorization for Records Disposal" were submitted to the Atomic Energy Commission for approval.

Uniform filing was established in three offices during the month, a total of 481 offices have installed the filing system to date. Eighteen rechecks were made on established files.

The Supervisor, Records Control, attended the Records Management Conference at Washington D. C. May 19 - 21, 1954.

proposal was submitted to substitute functional category schedules of records for disposal in place of the present procedure of scheduling individual records for disposal.

The advantages of functional category scheduling are:

a) Approximately 50% savings in cost of records scheduling over the present procedure.

b) Better evaluation of records to the overall records picture.

c) Simplification of procedure and reduction of paper work.

This proposal and a similar proposal made by Hanford Operations Office applying to construction contractor records were taken under consideration by the Washington Atomic Energy Commission's office for redrafting into a procedure for adoption.

It was agreed that functional category scheduling could be used by General Electric and Hanford Operations Office until the approval of the proposal procedure.

ADMINISTRATION AREA MAINTENANCE UNIT

AEC-114 New Transportation Facilities; Actual completion 79%; scheduled completion 67%. Walls and floors of main shop building 80% complete. Fire protection system installed in dispatchers' building and all duct work complete except for insulation. Finish grading begun for blacktop in general area.

CA-434 Bio-Assay Laboratory: Operating personnel moved from 706 to new building (747) on May 28.

CA-564 713 Building Alterations: Bids on AEC contract are due to be opened June 23, and it is anticipated that contract will be awarded before June 30.

IR-169 Alterations, Warehouse #13, Stores Yard No. 2: Present indications are that contract will be complete prior to June 15.

CA-533 Official Telephone Exchange: AEC bid opening scheduled for June 17.

703 Basement Alterations: Informal Request, replacing original project proposal CA-571, was forwarded to AEC on May 18. Not yet returned approved.

Responsibility for care of lawn in front of 700 Area was transferred from Community Public Works to Transportation Section.

A total of four doors and 110 lineal feet of Hauserman partitioning were installed, on one request from 200 Areas totaling 92 feet, with four smaller requests from 700 and 300 Areas accounting for the remainder.

ne office moves were made during the month.

Order was issued to install wire guard rail to protect grass along edge of sidewalks leading from front of 703 and 760 Buildings.

Hutment 712-A is scheduled for sale and removal in June.

AEC was advised that we anticipate no permanent future need for approximately 20 acres along west side of the present 700 Area.

General Maintenance

This Unit assumed responsibility for janitor and building services as of May 17. A total of 39 building service employees were transferred in.

Twelve 703 Building offices, 717 Building dark room, office in 717-A Building and five rooms at hospital were repainted in May.

Other painting work included touch-up jobs, furniture refinishing, and striping stalls of new 300 Area parking lot.

Two carpenters worked full time on crating and shoring excess materials.

Remodeling of 722-C Building office was completed.

Six large laundry carts were made for 200-West Laundry.

Cabinets were revised, and sinks and floor covering were replaced in 717 Building dark room.

Locksmith work included repair of vault door and three safe locks for Blaw-Knox, master-keying of ten door locks for Real Estate Section, repair of three 200-W vault combinations, and rebuilding of twenty door locks in 105-B.

Fifteen fluorescent light fixtures were installed in 703 Building and additional incandescent lights were installed in attic.

Switches were provided for light circuits in 760 Building attic.

Class A electrical inspection was made on Central Stores fork-lift trucks and all batteries were removed and cleaned.

Inspection was made of portable electric tools and all mechanics' hand tools.

Circuit was repaired and new contactors installed on Central Stores floodlights.

Radiator push nipple replacement program was completed in W-10. Program is approximately 60% completed in 770-A and 770-B.

Two air conditioners on 761 Building were replaced with larger coolers and a smaller size cooler was installed on 704.

Roof ventilator was installed and duct work revised to improve cooling in office area of 713-A Building.

Ladder truck pedestal was repaired and a transformer platform fabricated for Richland Electrical Unit.

Door track and rollers were replaced at Yakima Barricade and at Riverland Shop.

The 5" underground loop was removed and a temporary 2" bypass was provided for convenience of contractor laying new sewer line north of 761 Building.

A number of electrical outlets and buzzers were installed for convenience of tenants and repairs were made to electrical equipment.

Annual summer overhaul of No. 1 boiler at 784 Power Plant is in progress. Work is approximately 30% complete.

Steam Operation

Numbers 2 and 3 boilers were in service at the beginning of the month, with No. 4 in reserve and No. 1 undergoing annual overhaul.

Decreasing heating loads permitted No. 2 boiler to be taken off the line on May 17 for minor repairs, leaving No, 3 boiler in service. On May 24, No. 2 boiler was again placed in service and No. 3 boiler removed from the line. No. 2 boiler remained in service for the balance of the month, with Numbers 3 and 4 in reserve.

The quantity of steam generated at 784 plant was 12.4% less than for the same period of the previous year.

Inspection of underground steam line pits was begun during the month. The findings to date have been favorable with very few leaks being discovered.

To reduce the coal stock pile inventory, rail receipts were discontinued on May 11. Since that date coal has been moved from the stockpile to the track hopper by bulldozer. Rail shipments will be resumed after August 1.

Coal Consumed: 965.70 net tons.

Steam generated:	13,751.5 M Lbs.
Steam leaving plant:	11,924.5 M Lbs.
Steam delivered:	9,692.5 M Lbs.
Total water softened	1,881,200 gallons
Total soft water sent to Kadlec Hospital	87,350 gallons
Total soft water sent to 784 Heating Plant	1,793,850 gallons

Operations at 1131 Area Heating Plant tapered off during the month and the plant was closed down on May 16.

Heat was not required at Central Stores Heating Plant after the middle of May.

SECURITY AND PATROL UNIT

Document Report

Number of classified documents and prints unaccounted for as of May 1: 354
(132 of the above 354 documents are chargeable to E. I. du Pont de Nemours & Company)

Number of classified documents and prints reported as unaccounted for during May: 37
(There were 25 documents and 12 prints reported as unaccounted for)
(None of the above 37 documents are chargeable to E. I. du Pont de Nemours & Company)

Number of classified documents and prints either recovered or downgraded during the month of May: 37
(Eight of the 37 documents are chargeable to E. I. du Pont de Nemours & Company)
(There were 18 documents and two prints located, and five documents and 12 prints downgraded)

Number of classified documents and prints remaining unaccounted for as of June 1, 1954: 354
(124 of the above 354 documents are chargeable to E. I. du Pont de Nemours & Company)

The Non-Technical Document Review Board held four meetings during May and reviewed a total of 246 documents and prints. Of this number -

115 had their classification retained,
105 had their classification downgraded to "Official Use Only",
17 were declassified, and
10 were not within the scope of the Board.

Security Education

Four security items appeared in the GE NEWS during the month.

There were 332 security meetings held and attended by 4,267 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 17 meetings, each with an average attendance of 26 employees.

"Operation Ivy" was shown at four meetings, each with an average attendance of 18 employees.

GE Security Bulletin No. 84 entitled "The Attorney General's List" was issued May 13.

Two thousand copies of the Security "A-B-C" pamphlet with the slogan "Classified Documents may not be Taken Home" were distributed to personnel throughout the plant during May.

Ninety-four 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.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-W	300
Pat searches	84	84	42	85	0	0	1
Escorts	16	12	8	50	10	40	51
Ambulance runs	2	4	1	1	0	3	6
Passes issued:							
One day temporary	74	8	4	8	0	38	33
Travel	0	0	0	0	0	0	60
Red Tag	105	105	63	38	0	468	73
Telephonic	0	0	0	0	0	0	3
Supervisors' Post Contacts	393	303	287	282	337	850	437
Other Security Patrol Activities (computed by hours):							300 & 700
Security File Check	185	215.5	160.8*	294*	392	546	1,288
Building Check	316	28			413	567	672

* 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	Fined	Jailed
Speeding	3	3	3	0
Assault in second degree	1	1	1	1
Negligent driving	1	1	1	0
No valid operator's license and failure to meet requirements of financial responsibility act	1	1	0	1
	6	6	5	2

Citation Tickets issued: 6
Warning Tickets issued: 40

Security Patrol Training Activities

151 Security Patrolmen received classroom instruction during the month.

159 Security Patrolmen received Firearms training during the month.

Training courses were as follows:

Safety Class	1/4 hour
Security Class	3/4 hour
Operations Class	1 hour

Security Patrol Post Changes

On May 10, the 105-KW Block Rover, 100-K Area, was discontinued.

The 105-KE Visitor's Level Post was discontinued May 19.

On May 10, the 105-KE Block Rover post was established in 100-K Area.

The 105-KE "X" level post and the 105-KE "X" Level Rover post were established May 12, 100-K Area.

On May 13, the Visitor's Level Post, 105-KE, was established.

General

Of the 354 unaccounted for documents and prints, 28 documents and 23 prints are reported as unaccounted for as result of the April-May self-inventory conducted.

On May 5, the call letters of the Security Patrol master radio station WBMB were changed to KKE-624.

Unaccounted for Document Status as of May 31, 1954

Material	Classifications			Total
	Top Secret	Secret	Confidential	
GE Documents	0	140	16	156
du Pont Documents	0	99	25	124
Prints	0	63	9	72
Specifications	0	2	0	2
	0	304	50	354

Security Administration Information

Daily badge log entries:	2,890
"Q" Clearances:	62
Formal "P" clearances issued:	38
"P" approval clearances issued:	27
Category access granted:	39
Category access withdrawn:	34

Re-photographing Project for May

Number of "A" badges processed	30
Number of "B" badges processed	106
Photos for Passes	22
	158

[redacted]

HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING MAY 31, 1954

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT							
I. Visits to other Installations							
R. C. Grant to: Aircraft Gas Turbine Division General Electric Company Cincinnati, Ohio	Salary reconciliation conference of Defense Products Division	G. P. Lehmann	5-3-54	5-5-54		X	
F. J. McKinnon to: U. S. Atomic Energy Comm. Oak Ridge, Tennessee	Attend annual conference of AEC and contractor safety and fire protection personnel	M. H. Marsden	5-13-54	5-15-54	X		
D. W. McLenegan to: Knolls Atomic Power Lab. Schenectady, New York	Review developments and technical personnel needs	F. E. Crever J. D. Leslie	5-10-54	5-12-54	X		
D. W. McLenegan to: Aircraft Nuclear Propulsion General Electric Company Cincinnati, Ohio	Review developments and technical personnel needs	D. R. Shoults M. C. Leverett D. P. Johnson	5-13-54	5-14-54	X		
D. J. Quigley to: Aircraft Nuclear Propulsion General Electric Company Cincinnati, Ohio	Interview for employment	L. F. Hardy D. Vanderells D. R. Shoults	5-26-54	5-27-54	X		
ENGINEERING DEPARTMENT - ENGINEERING ADMINISTRATION SUB SECTION							
I. Visits to other Installations							

[redacted]

1211038

DECLASSIFIED

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
A. B. Greninger to: Knolls Atomic Power Lab. Schenectady, New York	Technical consultation on reactor, separations, and fuel slug technology	K. R.Van Tassel	5-3-54	5-5-54	X		
A. B. Greninger to: E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Technical consultation on reactor, separations, and fuel slug technology	H. L. Greene	5-5-54	5-6-54	X		
A. B. Greninger to: Aircraft Nuclear Propulsion General Electric Company Evandale, Ohio	Technical consultation on reactor, separations, and fuel slug technology	D. R. Shoults	5-7-54	5-7-54	X		
A. B. Greninger to: Feed Material Production Center National Lead Company Fernald, Ohio	Technical consultation	F. L. Cuthbert	5-7-54	5-7-54	X		
R. M. Smithers to: General Engineering Lab. Schenectady, New York	Discuss financial administrative assistance to Hanford procedure	R. J. Rodwell J. L. Michaelson	5-11-54	5-13-54	X		
R. M. Smithers to: Knolls Atomic Power Lab. Schenectady,New York	Discuss financial administrative assistance to Hanford procedure	R. Turner W. W. Smith	5-11-54	5-13-54	X		
R. M. Smithers to: Appliance Services Div. Schenectady, New York	Discuss financial administrative assistance to Hanford procedure	H. J. Baldwin A. M. Saigendorf	5-11-54	5-13-54	X		

ENGINEERING DEPARTMENT - DESIGN SECTION

I. Visitors to this Works

R. G. Lorraine Atomic Power Study Group General Electric Company Schenectady, New York	Discuss reactor development	V. D. Nixon R. H. Beaton	5-24-54	5-26-54	X	700	

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
A. G. Mellor Atomic Power Study Group General Electric Company Schenectady, New York	Discuss reactor development	V.D. Nixon R. H. Beaton	5-24-54	5-26-54	X		
II. Visits to other Installations							
H. J. Bellarts to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Third Information Meeting on Hot Labs	L. G. Stang, Jr.	5-26-54	5-28-54	X		
T. W. Jeffs to: Brookhaven National Lab. Upton, Long Island, New York	Present paper on Third Information meeting on Hot Labs	L. G. Stang, Jr.	5-26-54	5-28-54	X		
G. M. Roy to: Knolls Atomic Power Lab. Schenectady, New York	Physical plant inspection and conferences on nuclear engineering, reactor physics, lattice performance, boiling studies	B. R. Prentice T. Snyder	5-10-54	5-14-54	X		
G. M. Roy to: General Engineering Lab. Schenectady, New York	Physical plant inspection and conferences on nuclear engineering, reactor physics, lattice performance, boiling studies	H. E. Grantz	5-10-54	5-14-54	X		
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visits to other Installations							
L. E. McReynolds to: U. S. Atomic Energy Comm. Oak Ridge, Tennessee	Attend annual conference of AEC and contractor safety and fire protection personnel	M. H. Marsden	5-13-54	5-14-54	X		
M. G. Patrick to: General Engineering Lab. Schenectady, New York	Witness testing of equipment fabricated at GEL	J. E. Brown, Jr. E. Long	5-18-54	5-19-54	X		

Ja-16

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
G. G. Taylor to: U. S. Atomic Energy Comm. Oak Ridge, Tennessee	Attend annual conference of AEC and contractor safety and fire protection personnel	M. H. Marsden	5-13-54	5-14-54	X		
ENGINEERING DEPARTMENT - TECHNICAL SECTION							
I. Visitors to this Works							
J. G. Beach Battelle Memorial Institute Columbus, Ohio	Discuss metallurgy of uranium	G. E. McCullough J. A. Ayres	5-7-54	5-7-54	X	100-B 105-B, 105-C 100-D 105, 189 200-E XXX 200-W XXX 300-L 303; 700	
A. P. Beard Knolls Atomic Power Lab. Schenectady, New York	Discussion of fuel elements	G. E. McCullough J. A. Ayres	5-6-54	5-7-54	X	100-B 105-B, 105-C 100-D 105, 189 200-E XXX 300-L 303; 700	
J. R. Driear E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Conference on alpha canning	W. T. Kattner E. A. Smith	5-10-54	5-14-54	X	300-L 303	
J. R. Keeler Battelle Memorial Institute Columbus, Ohio	Discuss metallurgy of uranium	G. E. McCullough J. A. Ayres	5-4-54	5-7-54	X	100-B 105-B, 105-C 100-D 105, 189 200-E XXX 200-W XXX 300-L 303; 700	
C. C. Steffens Stanford Research Institute Berkeley, California	Discuss fuel element technology	R. W. Benoliel	5-17-54	5-21-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 200-E XXX 300-L 303; 700	
J. J. Stanley E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Conference on alpha	W. T. Kattner E. A. Smith	5-10-54	5-14-54	X	300-L 303	

Ja-17

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
D. W. White, Jr. Knolls Atomic Power Lab. Schenectady, New York	Discussion of fuel elements	G. E. McCullough J. A. Ayres	5-6-54	5-7-54	X		100-B 105-B, 105-C 100-D 105, 189 300-L 303; 700
H. A. Wilhelm Ames Laboratory Iowa State College Ames, Iowa	Discuss fuel element development	G. E. McCullough	5-12-54	5-14-54	X		100-B 105-B, 105-C 100-D 105, 189 200-E XXX 200-W XXX 300-L 303; 700

II. Visits to other Installations

G. J. Alkire to: Argonne National Lab. Lemont, Illinois	Discuss mass spectrometric problems	M. G. Inghram C. E. Crouthamel	5-20-54	5-21-54	X		
C. L. Boyd to: Argonne National Lab. Lemont, Illinois	Inspect equipment at hot laboratories	R. A. Blomgren	5-24-54	5-24-54	X		
C. L. Boyd Westinghouse Atomic Power Div. Pittsburgh, Pennsylvania	Inspect equipment at hot laboratories	R. T. Jones	5-25-54	5-25-54	X		
C. L. Boyd to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Information meeting on hot laboratories	L. G. Stang, Jr.	5-26-54	5-28-54	X		
W. L. Bunch to: Knolls Atomic Power Lab. and West Milton Site Schenectady, New York	Present paper at Shielding Information Meeting	C. R. Horner D. P. Jones	5-13-54	5-14-54	X		
L. P. Bupp to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation and control	E. P. Lee F. E. Creever J. F. Flagg	5-3-54	5-4-54	X		
L. P. Bupp to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspect separations plant and discuss materials testing reactor experiments	R. L. Doan	5-4-54	5-5-54	X		

Ja-18

[redacted] DECLASSIFIED

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
L. P. Bupp to: Submarine Thermal Reactor Westinghouse Electric & Mfg. Co. Idaho Falls, Idaho	Discuss pressurized water cooling systems	F. Raisbeck	5-4-54	5-5-54	X		
E. W. Christopherson to: Brookhaven National Lab. Upton, Long Island, New York	Present paper and attend Third Information meeting on hot laboratories	L. G. Stang, Jr.	5-26-54	5-28-54	X		
R. E. Falkoski to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Residence training relative to "Mint" Isotopic Enrichment facilities	M. Roy	4-6-54	5-25-54	X		
J. E. Faulkner to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss critical mass problems and experimental physics problems	C. Mark H. C. Paxton R. Peterson C. R. Cowan	5-26-54	5-28-54	X		
P. F. Gast to: Oak Ridge National Lab. Oak Ridge, Tennessee	Lecture to Reactor Technology School	Dr. Vonderlage	5-17-54	5-18-54	X		
J. F. Gifford to: Brookhaven National Lab. Upton, Long Island, New York	Attend Third Information Meeting on hot labora-	L. G. Stang, Jr.	5-26-54	5-28-54	X		
J. C. Johannesen to: Phillips Petroleum Co. Idaho Falls, Idaho	Consultation regarding slug testing facility	R. J. Nertney W. B. Lewis	5-11-54	5-14-54	X		
J. C. Johannesen to: Phillips Petroleum Co. Idaho Falls, Idaho	Installation of GEH-4	W. B. Lewis	5-27-54	6-17-54	X		
B. F. Judson to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss recovery operations at X-10	W. H. Lewis	5-3-54	5-7-54	X		
W. T. Kattner to: Bridgeport Brass Co. Adrian. Michigan	Consultation on u[illegible] metallurgy		4-20-54	10-20-54	X		

DECLASSIFIED

DECLASSIFIED

Ja-19

1217043

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
W. T. Kattner to: Battelle Memorial Inst. Columbus, Ohio	Consultation on uranium metallurgy	H. A. Saller	4-20-54	10-20-54	X		
W. T. Kattner to: National Lead Company Fernald, Ohio	Consultation on uranium metallurgy	J. M. Ciborski	4-20-54	10-20-54	X		
W. T. Kattner to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Consultation on uranium metallurgy	W. M. Leaders	4-20-54	10-20-54	X		
L. W. Lang to: Argonne National Lab. Lemont, Illinois	Consultation on analysis on irradiated materials and discuss Argonne fuel program	M. Rodin J. M. West	5-24-54	5-25-54	X		
C. A. Lund to: Phillips Petroleum Co. Idaho Falls, Idaho	Proposed irradiation program, experimental work in canal facility	D. Johnson D. R. Alvord	5-27-54	5-28-54	X		
R. E. McGrath to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation and control	E. P. Lee F. E. Creever J. F. Flagg	5-3-54	5-4-54	X		
R. E. McGrath to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspect separations plant and discuss materials testing reactor experiments	R. L. Doan	5-4-54	5-5-54	X		
R. E. McGrath to: Submarine Thermal Reactor Westinghouse Electric & Mfg. Co. Idaho Falls, Idaho	Discuss pressurized water coolings systems	F. Raisbeck	5-4-54	5-5-54	X		
L. F. Miller to: Knolls Atomic Power Lab. Schenectady, New York	Discuss hot laboratories and handling equipment for analytical facilities	B. F. Rider	5-24-54	5-25-54	X		

12/7/54

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
R. H. Moore to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Discuss uranium trioxide reactivity	A. E. Ruehle	5-3-54	5-3-54	X		
G. C. Oberg to: Phillips Petroleum Co. Idaho Falls, Idaho	Discuss mutual problems on separations plants	D. G. Reid	5-13-54	5-14-54	X		
W. J. Ozeroff to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss critical mass problems and theoretical physics problems	C. Mark H. C. Paxton C. Zabel	5-26-54	5-28-54	X		
R. S. Paul to: Phillips Petroleum Co. Idaho Falls, Idaho	Installation of GEH-4	W. B. Lewis	5-27-54	6-17-54	X		
E. C. Pitzer to: Argonne National Lab. Lemont, Illinois	Attend American Electrochemical Society and discuss chemical problems	S. Lawroski	5-7-54	5-10-54	X		
P. H. Reinker to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation and control	E. P. Lee F. E. Creever J. F. Flagg	5-3-54	5-4-54	X		
P. H. Reinker to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspect separations plant and discuss materials testing reactor experiments	R. L. Doan	5-4-54	5-5-54	X		
P. H. Reinker to: Submarine Thermal Reactor Westinghouse Electric & Mfg. Co. Idaho Falls, Idaho	Discuss pressurized water cooling systems	F. Raisbeck	5-4-54	5-5-54	X		
R. L. Reynolds to: General Engineering Lab. Schenectady, New York	Consultation on underwater examination equipment	J. E. Brown, Jr.	5-19-54	5-19-54	X		
R. B. Richards to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation and control	E. P. Lee F. E. Creever J. F. Flagg	5-3-54	5-4-54	X		

Ja-21

12/10/45

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
R. B. Richards to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspect separations plant and discuss materials testing reactor experiments	R. L. Doan	5-4-54	5-5-54	X		
R. B. Richards to: Submarine Thermal Reactor Westinghouse Electric & Mfg. Co. Idaho Falls, Idaho	Discuss pressurized water cooling systems	F. Raisbeck	5-4-54	5-5-54	X		
J. W. Riches to: Battelle Memorial Inst. Columbus, Ohio	Consultation on uranium metallurgy	H. A. Saller	4-23-54	9-23-54	X		
J. W. Riches to: Bridgeport Brass Co. Adrian, Michigan	Consultation on uranium metallurgy	R. S. French	4-23-54	9-23-54	X		
J. W. Riches to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Consultation on uranium metallurgy	W. M. Leaders	4-23-54	9-23-54	X		
H. R. Schmidt to: Knolls Atomic Power Lab. Schenectady, New York	Discuss process chemistry	J. F. Flagg	5-12-54	5-14-54	X		
O. C. Schroeder to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor operation and control	E. P. Lee F. E. Creever	5-3-54	5-4-54	X		
O. C. Schroeder to: Phillips Petroleum Co. Idaho Falls, Idaho	Inspect separations plant and discuss material testing reactor experiments	R. L. Doan	5-4-54	5-5-54	X		
O. C. Schroeder to: Submarine Thermal Reactor Westinghouse Electric & Mfg. Co. Idaho Falls, Idaho	Discuss pressurized water cooling systems	F. Raisbeck	5-4-54	5-5-54	X		
Richard L. Tomlinson to: Knolls Atomic Power Lab. and West Milton Site Schenectady, New York	Present papers at Shielding Information Meeting	C. R. Horner D. P. Jones	5-13-54	5-14-54	X		

Ja-22

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
Roy E. Tomlinson to: Phillips Petroleum Co. Idaho Falls, Idaho	Discuss mtual problems on separations plants	D. G. Reid	5-13-54	5-14-54	X		
L. D. Turner to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss metallurgical problems	D. S. Billington S. E. Dismuke	5-19-54	5-20-54	X		
L. D. Turner to: Knolls Atomic Power Lab. Schenectady, New York	Discuss metallurgical problems	T. J. E. Glasson	5-24-54	5-25-54	X		
L. D. Turner to: Aircraft Nuclear Propulsion Project General Electric Company Cincinnati, Ohio	Discuss metallurgical problems	W. Baxter	5-21-54	5-21-54	X		
L. D. Turner to: Brookhaven National Lab. Upton, Long Island, New York	Present paper at Third Information meeting on hot laboratories and discuss metallurgical problems	L. G. Stang, Jr.	5-26-54	5-28-54	X		
G. E. Wade to: Phillips Petroleum Co. Idaho Falls, Idaho	Consultation regarding slug testing facility	R. J. Nertney W. B. Lewis	5-11-54	5-14-54	X		
G. E. Wade to: Phillips Petroleum Co. Idaho Falls, Idaho	Installation of GEH-4	W. B. Lewis	5-27-54	6-17-54	X		
O. J. Wick to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss plutonium and uranium metallurgy	E. R. Jette	5-26-54	5-28-54	X		
M. R. Wood, Jr. to: Phillips Petroleum Co. Idaho Falls, Idaho	Installation of GEH-4	W. B. Lewis	5-27-54	6-17-54	X		

Ja-23

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
R. E. Woodley to: Phillips Petroleum Co. Idaho Falls, Idaho	Proposed irradiation program, experiment work in canal facility	D. Johnson	5-27-54	5-28-54	X		
D. C. Worlton to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Field trial of testing equipment	L. G. Weber	5-18-54	5-21-54	X		
LEGAL DEPARTMENT							
I. Visits to other Installations							
H. Tellier to: U. S. Atomic Energy Comm. Washington, D. C.	Attend Records Management Meeting	T. J. Pugliese	5-17-54	5-19-54	X		
MANAGEMENT							
I. Visitors to this Works							
H. P. Bish Apparatus Division General Electric Company Schenectady, New York	Installation of GE equipment being installed by Kaiser	W. E. Johnson	5-21-54	5-21-54		X	
J. J. Davey Apparatus Division General Electric Company Schenectady, New York	Installation of GE equipment being installed by Kaiser	W. E. Johnson	5-21-54	5-21-54		X	
SPECIAL STUDIES GROUP							
I. Visitors to this Works							
R. G. Lorraine General Electric Company Schenectady, New York	Obtain information for Atomic Power Study	W. K. MacCready	5-24-54	5-26-54	X		
A. G. Mellor General Electric Company Schenectady, New York	Obtain information for Atomic Power Study	W. K. MacCready	5-24-54	5-26-54	X		

Ja-24

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
G. G. Giezel Applied Research Laboratory Glendale, California	Service spectrograph	J. W. Jordan	5-18-54	5-20-54	X		200-W 234, 235
J. R. Driear E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Discuss alpha canning	E. W. O'Rorke	5-10-54	5-14-54	X		300-L 303
R. C. Mann Aircraft Nuclear Propulsion Project General Electric Company Cihbinnati, Ohio	Discuss instrumentation problems	J. E. Kaveckis E. S. Day, Jr. H. C. Copeland M. T. Slind	5-13-54	5-14-54	X		200-W Redox 300-L 303 700
J. J. Stanley E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Discuss alpha canning	E. W. O'Rorke	5-10-54	5-14-54	X		300-L 303
II. Visits to other Installations							
S. M. Gill to: Feed Material Production Center National Lead Company Fernald, Ohio	Discuss uranium slug manufacturing problems	C. H. Walden	3-22-54	9-1-54	X		
K. H. Hammill to: Knolls Atomic Power Lab. Schenectady, New York	Discuss procedure inspection and analytical equipment	B. F. Rider	5-24-54	5-25-54	X		
K. H. Hammill to: Brookhaven National Lab. Upton, Long Island, New York	Present paper and Third Information Meeting on hot laboratories	L. G. Stang, Jr.	5-26-54	5-28-54	X		
J. M. Holeman to: Brookhaven National Lab. Upton, Long Island, New York	Attend Third Information Meeting on hot laboratories	L. G. Stang, Jr.	5-26-54	5-28-54	X		

Ja-25

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
P. C. Jerman to: General Electric Company Schenectady, New York	Gain information relative to radiation protection practices	L. L. German	5-3-54	5-5-54	X		
P. C. Jerman to: Knolls Atomic Power Lab. Schenectady, New York	Gain information relative to radiation protection practices	L. L. German	5-3-54	5-5-54	X		
P. C. Jerman to: Mound Laboratories Columbus, Ohio	Consultation on radiation protection practices	J. E. Bradley	5-4-54	5-5-54	X		
P. C. Jerman to: National Reactor Test Site Idaho Falls, Idaho	Gain information relative to radiation protection practices	G. V. Beard	5-6-54	5-8-54	X		
A. R. Keene to: General Electric Company Schenectady, New York	Gain information relative to radiation protection practices	L. L. German	5-3-54	5-5-54	X		
A. R. Keene to: Knolls Atomic Power Lab. Schenectady, New York	Gain information relative to radiation protection practices	L. L. German	5-3-54	5-5-54	X		
A. R. Keene to: Mound Laboratories Columbus, Ohio	Consultation on radiation protection practices	J. E. Bradley	5-4-54	5-5-54	X		
A. R. Keene to: National Reactor Test Site Idaho Falls, Idaho	Gain information relative to radiation protection practices	G. V. Beard	5-6-54	5-8-54	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
W. J. Blair, Jr. University of Rochester Richester, New York	Employment interview and inspect biology facilities and investigations	M. A. Kornberg	5-24-54	5-24-54	X		

Ja-26

12/7/050

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. T. Brennan Army Medical Corps Washington, D. C.	Act as courier for samples to the laboratory	H. M. Parker	5-22-54	5-23-54	X		100-F 108-F
L. A. Krumholz Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss ecology program	H. A. Kornberg	5-12-54	5-14-54	X		100-F 108-F
II. Visits to other Installations							
W. A. McAdams to: Oak Ridge National Lab. Oak Ridge, Tennessee	Study exposure records procedures and participate in AEC Safety panel	M. H. Marsden	5-13-54	5-14-54	X		
W. A. McAdams to: E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Study exposure records procedures	- -	5-17-54	5-19-54	X		
W. A. McAdams to: Argonne National Lab. Lemont, Illinois	Study exposure records procedures	- -	5-20-54	5-21-54	X		
H. A. Meloeny to: Oak Ridge National Lab. Oak Ridge, Tennessee	Study exposure records procedures	- -	5-13-54	5-14-54	X		
H. A. Meloeny to: E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Study exposure records procedures	- -	5-17-54	5-19-54	X		
H. A. Meloeny to: Argonne National Lab. Lemont, Illinois	Study exposure records procedures	- -	5-20-54	5-21-54	X		
L. C. Schwendiman to: Brookhaven National Lab. Upton, Long Island, New York	Attend Third Information Meeting on hot laboratories	L. G. Stang, Jr.	5-26-54	5-28-54	X		

Ja-27

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
PLANT AUXILIARY OPERATIONS DEPARTMENT - PLANT PROTECTION SECTION							
I. Visits to other Installations							
S. B. Badgett to: U. S. Atomic Energy Comm. Washington, D. C.	Attend Records Management Conference	T. J. Pugliese	5-17-54	5-19-54	X		
M.J. Headley to: E. I. du Pont de Nemours Wilmington, Delaware	Review retired Hanford & Co. Classified material for unaccounted for documents	F. M. Burns	4-12-54	5-14-54	X		
J. E. Smith to: E. I. du Pont de Nemours Wilmington, Delaware	Review retired Hanford & Co. Classified material for unaccounted for documents	F. M. Burns	4-12-54	5-14-54	X		
PLANT AUXILIARY OPERATIONS DEPARTMENT - OPERATIONS ANALYSIS SECTION							
I. Visitors to this Works							
F. T. Hagemann Argonne National Laboratory Lemont, Illinois	Consultation on special project	C. A. Bennett	5-21-54	5-21-54	X		
G. M. Havanagh U. S. Atomic Energy Comm. Washington, D. C.	Consultation on special project	C. A. Bennett	5-21-54	5-21-54	X		
C. Little U. S. Atomic Energy Comm. Washington, D. C.	View model work being done by Graphics	B. E. Leslie	5-11-54	5-11-54	X		
F. D. McKeon U. S. Atomic Energy Comm. Washington, D. C.	View model work being done by Graphics	B. E. Leslie	5-18-54	5-18-54	X		
W. K. Mahr U. S. Atomic Energy Commission Washington, D. C.	View model work being done by Graphics	B. E. Leslie	5-17-54	5-17-54	X		

Ja-26

PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY MAY 1954

STATISTICAL AND GENERAL

Drafts of the request for quotation on Steam Coal were approved by the Commission, and request for quotations covering our requirements for fiscal year 1955 and an alternate request covering fiscal years 1955, 1956, and 1957, have been sent to the vendors and the bids are due by June 11.

A proposal to the rail carriers resulted in a reduced rate on 17 Cask Assemblies from Alameda, California to the Project which will effect a savings of over $5,000.00 in transportation costs on this order.

Action has been taken to supplement the staff of the Construction Procurement Unit in order to handle the increasing work load and in view of the large number of requisitions being held by Engineering pending authorization of additional funds for Project CG-558. At present authorized funds for this Project cover only the procurement of horizontal rods.

A procedure was developed for transferring operational spare parts and equipment from Construction Contractors to General Electric. This procedure is acceptable to A.E.C.

To date 177 construction purchase orders, which include operational spares, have been received from Construction Contractors of which 104 have been processed.

54 formal lists of excess containing 5376 items valued at $572,657 were transmitted to the Commission. An additional 35 lists totaling $255,883 are being screened by the field prior to forwarding to the Commission.

A further reduction in back orders was made during May. As of May 28 back orders on hand were 662 compared with 880 as of May 7. These 662 back orders cover 335 line items which amount to 1.8% of the 18,300 line items booked in General Supplies Inventory.

During May material and equipment valued at $40,803 were withdrawn from Excess Accounts for use on the project, and $861,776 was processed for billing by Government Shipping Documents.

By increasing personnel in the Receiving Unit and through continuous study of ways to improve the receiving operation, it has been possible to reduce the backlog of shipments received - not processed to 1½ days.

Organization and Personnel	4-30-54	5-31-54	Change
Employees on Roll	278	282	+ 4

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
MAY 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.

May 1954 Cost Category	Government Agency	Small Business	Big Business	Educational and Other
$0 - $ 24.99	$ 45.95	$ 3,641.83	$ 1,738.45	$ 15.00
$25 - $ 499.99	187.00	112,068.79	50,079.38	89.25
$500 - $ 24,999.00		296,675.37	206,283.77	
$25,000 - $ Up		224,553.00	408,046.00	
	$ 232.95	$ 636,938.99	$ 666,147.60	$ 104.25
Number of Actions	6	1324	644	3

Vendors Contacts	159
Claims Processed	5
Damage Reports Processed	8
Over & Short Reports Processed	1
Accounts Payable Requests Handled	284
Difference Slips Processed	47
Clearance Slips & Purchase Order Change Approvals	205
Material Exception Reports	193
Return Orders Issued	152

Shown below is a summary of the net value of procurement actions placed with vendors for manufactured or shelf items in the states of Washington, Oregon, Idaho and Other Areas.

State	Manufactured	Shelf	Total
Washington	$ 415,442.58	$ 186,705.50	$ 602,148.08
Oregon	72,032.15	90,127.35	162,159.50
Idaho		345.58	345.58
Other	440,323.14	98,447.49	538,770.63
	$ 927,797.87	$ 375,625.92	$ 1,303,423.79

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT

	G	D	Total
Requisitions on hand 5-1-54			
Operations Procurement	774	0	774
Construction Procurement	0	251	251
A.E.C. Procurement	290	87	377
Total	1064	338	1402
Requisitions Assigned during May			
Operations Procurement	1723	0	1723
Construction Procurement	0	549	549
A.E.C. Procurement	418	103	521
Total	2141	652	2793
Requisitions Placed During May			
Operations Procurement	1699	0	1699
Construction Procurement	0	556	556
A.E.C. Procurement	471	81	552
Total	2170	637	2807
Requisitions on hand 5-31-54			
Operations Procurement	798	0	798
Construction Procurement	0	244	244
A.E.C. Procurement	237	109	346
Total	1035	353	1388

Purchase Orders Placed	HW	HWC	Total
Operations Procurement	1305		1305
Essential Material	29		29
Construction Procurement		518	518
Local Purchase	15		15
Total	1349	518	1867

Value of Orders Placed			
Operations Procurement	$ 548,712.97	$	$ 548,712.97
Essential Material	583,278.35		583,278.35
Construction Procurement		245,762.07	245,762.07
Local Purchase	121.85		121.85
Total	$ 1,132,113.17	$ 245,762.07	$ 1,377.875.24

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	29	37	15	81
Essential Material	6	5		11
HWC Construction	24	8	4	36
Total	59	50	19	128

Value of Alterations Issued	Increase	Decrease	Total
HW Operations	$ 2,125.05	$ 14,015.43	$ 16,140.48
Essential Material	8,386.57	71,722.23	80,108.80
HWC Construction	6,200,39	2,170.43	8,370.82
Total	$ 16,712.01	$ 87,908.09	$ 104,620.10

Government Transfers	OR	ORC
	1	0

Organization and Personnel	4-30-54	5-31-54	Change
Employees on Roll	25	20	-5

121855

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
MAY, 1954

A member of Construction Procurement Unit is attending the weekly meetings, of the Minor Construction Management Unit, on work schedules for Projects CG-573 and CG-514 in the 300 Area. This is being done to learn of bottlenecks in material, and assist in getting this material on the project in time for construction.

A representative of the Construction Procurement Unit was invited to attend a joint meeting of Design, Project and Technical Sections, on the new proposed hot press canning line in the 313 and 314 Buildings. Construction Procurement was asked to join in this discussion and give estimated procurement times and estimated prices on Engineered items.

The following figures depict the work load trend of this Unit:

	1954						
	Jan.	Feb.	Mar.	Apr.	4 Month Average	May	% Change
Requisitions assigned	307	365	475	550	424	549	29
Requisitions placed	373	318	486	488	416	556	34
Requisitions on hand	153	200	189	251	198	244	23

Action has been taken to supplement our staff in order to handle the increasing work load and in view of the large number of requisitions being held by Engineering pending authorization of additional funds for Project CG-558. At present authorized funds for this Project cover only the procurement of horizontal rods.

To meet the current need for increased expediting activity two expediters and one stenographer were added to the expediting group, which has been consolidated in one room to improve efficiency.

Organization and Personnel	4-30-54	5-31-54	Change
Employees on Roll	18	22	+ 4

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
MAY - 1954

Statistical and General

Drafts of the request for quotation on Steam Coal were approved by the Commission, and request for quotations covering our requirements for fiscal year 1955 and an alternate request covering fiscal years 1955, 1956, and 1957, have been sent to the vendors and the bids are due by June 11.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate - has not, as yet, been returned by the vendor.
2. Liquid Aluminum Sulfate - completed and in force.
3. Dry Aluminum Sulfate - has been approved by vendor and is ready for G. E. and A.E.C. approvals.
4. Sodium Dichromate - completed and in force.
5. Tributyl Phosphate - contract draft has been sent to vendor for signature.
6. Nitric Acid - partial - has been drafted, approved by DuPont, and is ready for G. E. and A.E.C. approvals.

Organization and Personnel	4-30-54	5-31-54	Change
Employees on Roll	32	34	+ 2

PURCHASING AND STORES SECTION
STORES UNIT
MAY 1954

STATISTICAL AND GENERAL

A procedure was developed for transferring operational spare parts and equipment from Construction Contractors to General Electric. This procedure is acceptable to A.E.C.

To date 177 construction purchase orders, which include operational spares, have been received from Construction Contractors of which 104 have been processed.

A total of 153 Stock Adjustment Requests have been received as authority to stock construction procured spares. The cooperation of the Manufacturing Department in submitting these documents prior to receipt of materials has been very good and has expedited the processing of purchase orders and establishment of stock records.

Under recently developed spare parts and equipment classifications or categories all spare parts and equipment accounts will fall under HCO classifications as established in the AEC Property Management Manual. The task of converting to the new classifications is a major one and therefore, will not be attempted until a decision is reached on a possible change to an IBM or Cardineer record keeping system.

54 formal lists of excess containing 5376 items valued at $572.657 were transmitted to the Commission. An additional 35 lists totaling $255,883 are being screened by the field prior to forwarding to the Commission.

Considerable interest was shown in the last two Surplus Sales. 264 prospective bidders were escorted through the sales yard during the month and $132,181 was realized in revenue from Surplus Sales conducted.

A further reduction in back orders was made during May. As of May 28 back orders on hand were 662 compared with 880 as of May 7. These 662 back orders cover 335 line items which amount to 1.8% of the 18,300 line items booked in General Supplies Inventory.

Data for the new Stationery catalog, Caption 27, was released for printing. This is the first catalog to be printed under the new numbering system.

Receiving volume continues to be very heavy; however, with the increased personnel and continuous study of ways to improve our system, we are able to keep our backlog down to within one day and a half of shipments received. We plan to reduce this backlog even further and believe this can be accomplished as soon as existing new personnel is properly trained.

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

Disbursement by store order	$ 33,158
Transfers to inventories and Plant Accounts	$ 7,645
Offsite shipments	$ 861,776
Receipts	$ 546,025

Organization and Personnel	4-30-54	5-31-54	Change
Employees on Roll	191	193	+ 2

PURCHASING & STORES SECTION

TRAFFIC UNIT

May, 1954

STATISTICAL AND GENERAL

As a result of our proposal, the rail carriers have published a reduced rate on 17 Cask Assemblies from Alameda, California to the Project which will effect a savings of over $5,000.00 in transportation costs on this order.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of May amounting $2,681.90. This makes a total savings from September 1, 1946 to date of $1,767,158.25.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for May, 1954	Savings from 9-1-46 thru April, 1954	Savings from 9-1-46 to date
Aluminum Extrustions	Edgewater, N.J.	$ 617.64		
Machinery, T/L	Los Angeles, Cal.	137.00		
Machinery, T/L	San Francisco, Cal.	90.00		
Silicate of Soda	Tacoma, Wash.	841.95		
Sulfamic Acid	Grasselli, N.J.	995.61		
		$2,681.90	$1,764,476.35	$1,767,158.25
2. Freight Bill Audit		1,164.74	121,098.64	122,763.38
3. Loss and Damage & Over-charge Claims		35.51	137,702.99	137,738.50
4. Ticket Refund Claims		453.28	38,706.69	39,159.97
5. Household Goods Claims			17,641.85	17,641.85
		$4,835.43	$2,079,626.52	$2,084,461.95

Work Volume Report

Completed Travel Requests		126.
Reservations resulting from above:	Rail	59
	Air	144
	Hotel	143
Expense Accounts Checked		304

PURCHASING & STORES SECTION
TRAFFIC UNIT
May, 1954

Work Volume Report (cont.)

Household Goods & Automobiles	Movements Arranged Inbound	1
	Movements Arranged Outbound	2
	Insurance Riders Issued	1
Ticket Refund Claims	Filed	14
	Collected - Number	5
	Collected - Amount	$453.28
Freight Claims	Filed	9
	Collected - Number	3
	Collected - Amount	$35.51
	Over and Shorts Processed	19
	Damage Reports Processed	15
Freight Bill Audit Savings		$1,664.74
Freight Shipments Traced		27
Quotations	Freight Rates	210
	Routes	194
Bills Approved	Air Express	41
	Boat	11
	Carloading	178
	Express	136
	Rail	883
	Truck	282
Carload Shipments	Inbound	924
	Outbound	5

Report of Carloads Received

Commodity	CMS TP&P	NP	UP	TOTAL
Aluminum Extrusions	1			1
Aluminum Sulfate	2	4	4	10
Asphalt	2			2
Building Paper		1		1
Caustic Soda	20	18	20	58
Chlorine			2	2
Coal	113	20	616	749
Fuel Oil	15	15	14	44
Iron & Steel	2			2
Lacquer Solvents		1		1
Lime		2		2

PURCHASING & STORES SECTION
TRAFFIC UNIT
MAY, 1954

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	TOTAL
Limestone	1		1	2
Methyl Isobutyl Ketone	1			1
Nitric Acid		11	11	22
Oxalic Acid		1		1
Salt	1	1	1	3
Sheet Lead			1	1
Silicate of Soda	2	1	2	5
Soda ash	2	1	1	4
Sodium Nitrate			1	1
Steel Strapping		1		1
Steel Containers	1			1
Sulfamic Acid		1		1
Sulphuric Acid		1	1	2
Merchandise & Stop Cars			7	
Total	163	79	682	924

Organization & Personnel	4-30-54	5-31-54	Change
	9	9	0

[redacted] DECLASSIFIED

TRANSPORTATION SECTION
MONTHLY REPORT
May 1954

Transportation Section personnel forces decreased from 486 to 485 by six new hires, one transfer in, one reactivation-personal illness, one termination and eight transfers out.

The decontamination center in the 200-West Area which was established in April was in operation throughout the month and 26 units of HO equipment were released by the Radiation Monitoring Unit. This work is being performed by Transportation personnel under special work permit conditions and is expected to require a minimum of three to four months.

Arrangements have been completed for a special cost liquidation of $20,226 to the Manufacturing Department for overtime work on process service during the first ten months of FY 1954. This will reduce the fiscal year to date under liquidation to only $566.

A.E.C. auditors from the Audit Branch of the Finance Division informally reviewed and discussed fuel records maintained by the Transportation Section with respect to the refund of state taxes and the annual audit by the Department of Licenses, State of Washington.

There were 104 new 1954 Chevrolet sedans received during the month, of an allotment of 110 units for the current fiscal year. These units will be utilized to replace all 1948 Pontiac sedans and other high mileage units which qualify for replacement.

K-7 International evacuation buses are being replaced by 41-passenger White buses formerly utilized by Construction forces. Training of personnel in the operation of this equipment will be provided by 100-B and 100-D standby drivers.

Construction of the Consolidated Transportation Facility progressed from 56% on April 23 to 66% on May 21 compared to the scheduled 78%. An average of approximately 83 craftsmen were engaged in this activity during the reporting period.

Coveralls have been furnished to about 250 Transportation employees under the more liberal policy of providing such clothing to personnel performing work which subjects personal clothing to considerable soiling. The coveralls were [redacted]

Transportation Section

Railroad carloads of commercial materials during May increased by 625 cars or 32.45% over April due to higher receipts of coal and construction materials. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	941	30	29	939
A.E.C.	114	0	0	94
A.E.C. - Kaiser Engineers	44	0	0	47
Blaw-Knox	32	1	1	37
Bumstead & Wolford	8	0	0	8
Cisco Construction Company	1	0	0	2
Gaasland Construction Co.	2	0	0	1
Groves, Shepard, Wilson & Kruge	1	0	0	1
L. H. Hoffman	1	0	0	0
Kaiser Engineers	64	0	0	49
Sound Construction Co.	4	0	0	4
U. S. Army	48	0	0	48
	1,260	31	30	1,230

Railroad process service is now being rendered under more satisfactory operating conditions than those encountered since the advent of uncontrolled contamination in January and required only 323 man-hours of overtime during May while actual process cars increased 41.73% over April.

Arrangements have been completed to establish a swing shift effective June 14 for servicing railroad equipment at Riverland. Two men will be assigned to this shift on a rotating basis from the day crew. This action is necessary to minimize delays at the start of the day shift stemming from increased train crew operations at night for process service.

The Plant Bus System transported 1.68% fewer passengers in May than in April. The following statistics indicate the magnitude of service rendered:

Passenger volume	144,826
Revenue - bus fares	$ 7,241.29
Earnings - transit advertising (April)	$ 87.03
Bus trips	6,884
Bus miles - passenger carrying	194,204
Passenger miles	4,484,411

The Richland Bus System transported 8.61% fewer passengers in May than in April primarily because of a reduction in student patronage which permitted the seasonal discontinuance of the Cedar Route student booster. The following statistics indicate the volume of service rendered:

Total passengers including transfers	12,207
Revenue - bus fares	$ 769.70
Earnings - transit advertising (April)	$ 3.98
Bus trips	1,194
Bus miles - passenger carrying	6,328
Passenger miles	32,835

Transportation Section

Special bus transportation was provided on April 29 for a tour of the Manufacturing Areas by 41 visiting officials from the Stanford Research Institute.

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 126 which were rendered to the following locations as indicated:

Benton City, Washington	6
Grandview, Washington	4
Hinkle, Oregon	13
Kennewick, Washington	20
Pasco, Washington	53
Pendleton, Oregon	5
Prosser, Washington	3
Richland "Y", Washington	2
Sunnyside, Washington	9
Walla Walla, Washington	1
Yakima, Washington	7
West Richland, Washington	3

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

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	49,370	21,330	12,000	2,500	199
Received during month	98,743	12,100	24,400	880	0
Dispensed during month	100,168	13,135	25,900	2,768	62
Stock at end of month	47,945	20,295	10,500	612	137

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

Motor overhauls	61
Class A Inspections and Repairs	133
Class B Inspections and Lubrications	1,105
Semi-monthly Inspections - Buses	140
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	38
Other routine maintenance repairs and service calls	1,613
Accident Repairs and Paint Jobs	40
Tire Repairs	621
Wash Jobs	461
	4,212

he following tabulation indicates the number of HO mileage vehicles in service during April and the utilization for each type:

Code	Type	No. of Units	Total Mileage
1A	Sedans	337	543,505
1B	Buses	98	218,377
1C	Pickup Trucks	460	237,195
1D	Panel,Carryall,Sta.Wagons	160	138,157
1E	Armored Cars	1	149
1G	Jeeps	2	430
68 Series	Trucks	207	73,745
		1,265	1,211,558

Maintenance of primary roads required 573 man-hours; secondary roads 24 man-hours; and patrol roads and trails 59 man-hours. Twenty additions and improvements to existing walkways, parking facilities and related ground maintenance in the Manufacturing Areas required 550 tons of asphaltic pre-mix, 7500 gallons of asphalt, 250 cubic yards of mineral aggregate and 601 man-hours. Seal coating of approximately one mile of road in the 100-F Area required 200 cubic yards of crushed rock, 10.3 tons of asphaltic material and 192 man-hours.

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

	MC 3	MC 5
Stock at start of month	30.79	69.97
Received during month	76.59	0
Used during month	58.40	0
Stock at end of month	48.98	69.97

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

	3/4" to 0 Pre-mix Tons	¼" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	292	219.5	3,209	4,106	2,773
Made during month	629	313	1,025	0	0
Used during month	767	319	2	270	537
Stock at end of month	154	213.5	4,232	3,836	2,236

June 4, 1954

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

May, 1954

GENERAL

The Section total work force was one hundred and sixty-eight (168) as of May 31, 1954, no change from last month.

Plant electrical peak demand for May:

Date	Demand KW	April Comparative KW Demand
5-28-54 (10:30 AM-11:00 AM)	117,000	117,400

On June 1, 1954, the North Richland electrical load, presently 4300 KW, will be transferred from the Plant contract to a separate contract with the Bonneville Power Administration. Studies have indicated that this action will result in an annual saving of $10,000-$15,000 to the Hanford Atomic Products Operation.

Physical inventories of all material in the custody of the Section, with the exception of static truck stocks, were taken on May 20 and 21.

Overtime hours for the month amounted to 1.2% of scheduled time for the Telephone Unit and 1.3% for the Electrical Distribution Unit. Of these amounts, .4% and .9% respectively, were instigated by customers' service requests.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

At 6:35 AM on May 6, power was interrupted on the 115 KV system due to the failure of an automatic splicing sleeve in the line. Power was restored to the 300 Area in approximately eight minutes and to Richland and North Richland in thirty-five minutes.

Electrical disturbances were experienced on the Hanford 230 KV system at 4:08, 4:25, 4:30, 4:35 and 5:37 AM on May 11. These disturbances were caused by lightning on the BPA system. No production loss resulted.

ELECTRICAL DISTRIBUTION (Continued)

System Expansion and Planning

On May 5, the in-line switch and dead-end structure for the east tap to the 100-K Area were installed and cut into the existing 230 KV line. The work was accomplished in approximately twelve hours on a planned critical power grade "W" and the system was returned to normal at 5:48 PM.

Two new 2300 volt cubicles, which will subsequently supply power to the 313 Building extension, were installed in the 300 Area substation.

The advisability of using concrete cone anchors, rather than treated log anchors, has been well confirmed by tests and study of costs. The use of cones in an anchor replacement program scheduled over the next eighteen months will save approximately $10,000 in costs.

TELEPHONE UNIT

Maintenance and Operation

On Sunday, May 16, a fire in the Blaw-Knox administration building resulted in the failure of their telephone facilities with a limited amount of damage to the PBX and to 65 telephone instruments. The offices were relocated in North Richland and 47 new service connections were made.

Work was completed on the installation of nine additional direct-dialing amplified circuits between the Richland and BY exchanges.

System Expansion and Planning

The installation of Richland telephones served through the North Richland exchange is virtually complete with 204 customers connected at May 31.

Plans were formulated to serve the 100-K operations telephones temporarily from the 100-K construction switchboard through a connecting 100-pair tie cable to the 1720-K Building.

Circuits which automatically count the calls accepted by each toll board position were installed. This information used in conjunction with that provided by other counters of incoming calls will be used in studies of efficiency and position loading.

A summary of telephone service is as follows:

	Subscriber Stations In Service		Lines Available For Service	Sides Available For Service	Exchange Lines In Service
	Res. and Misc.	Official			
Richland	6112	990	14	333	4061
N.Richland	571	225	115	33	426
Process Areas	22	1875	349	--	1703
Total	6705	3090	478	366	6190

Richland-North Richland four-party service:

	May 20, 1954	April 20, 1954
Number of subscribers	1485	1390
Number of vacant sides	211	230

Seventy-six (76) new requests for telephone service in Richland were received, making the backlog two hundred and thirty-four (234).

Service orders during the month were as follows:

Residential and commercial	396
Official (permanent)	278
Official (temporary)	71
Total	745

R.B. Britton
ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

RB Britton:MAW:ag

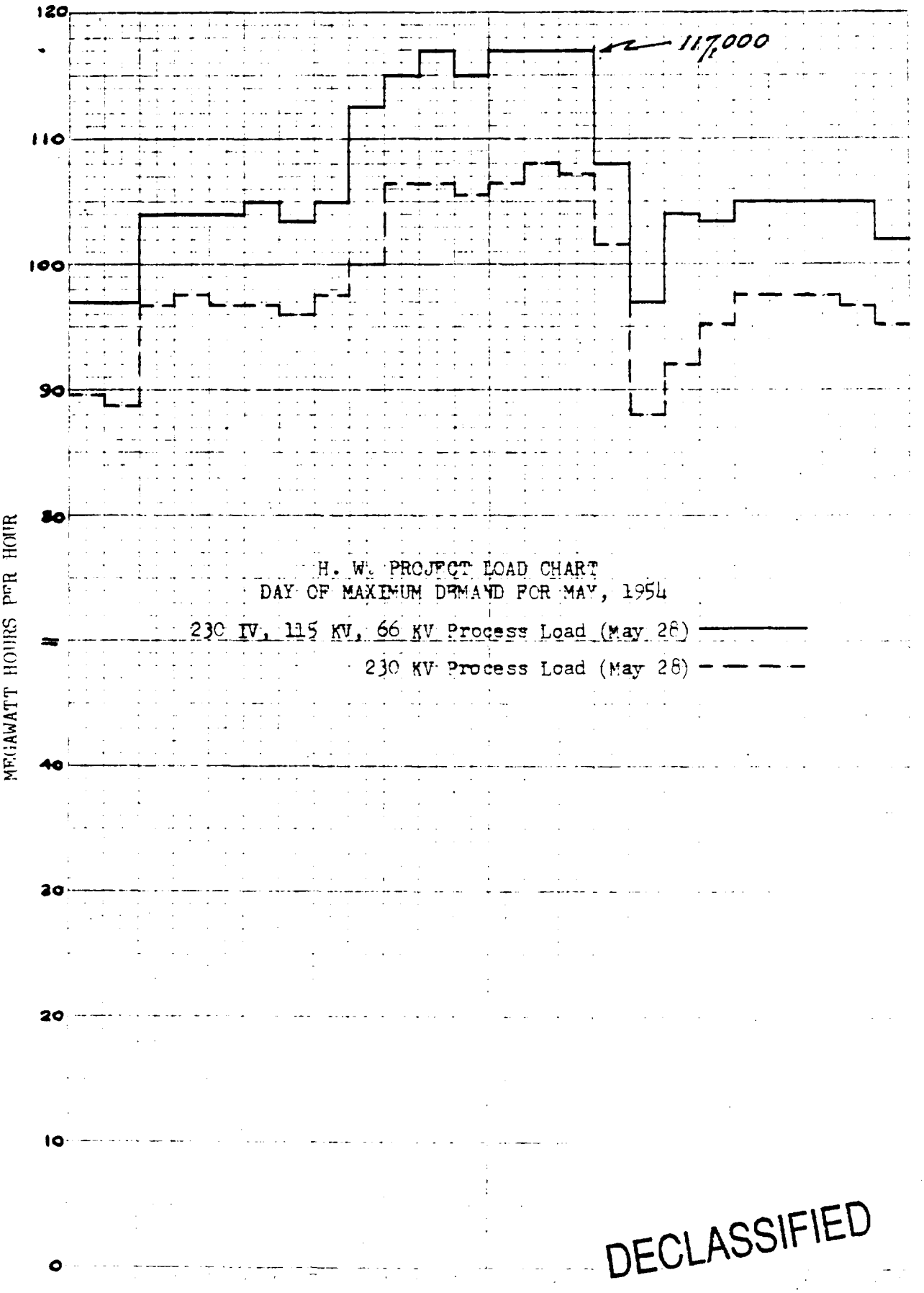
[redacted]

POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING MAY 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)	25040	28750	45400	48700	76.6	79.3
A-4 Out (100-D)	14860	16860	24300	26000	84.9	87.2
A-5 Out (100-H)	9420	8370	14800	14500	88.4	77.6
A-6 Out (100-F)	9130	7890	14300	14000	88.7	75.8
A-8 Out (200 Area)	5600	5770	9500	9300	81.9	83.4
TOTAL OUT	64050	67640	108300**	112500**	82.1	80.8
MIDWAY IN	64795	68236	105600*	108000*	85.2	84.9
115 KV System						
B1-S4 Out (N. Rich.)	1978	1675	4262	3629	64.5	62.0
B1-S5	94	144	432	691	30.3	28.0
Richland	9650	8418	21440*	17280*	62.5	65.5
BB3-S4 Out (300 Area)	1744	1816	5520	6400**	43.9	38.1
TOTAL OUT	13466	12053	31654**	28000**	59.1	57.9
Benton In	13920	12220	34000*	32800*	56.9	50.7
So. Richland In	20	100	2000*	16400*	1.4	8..
TOTAL IN	13940	12320	36000**	49200**	53.8	33.6
66 KV System						
B9-S11 Out (100-K)	1614	1680	3120	3000	71.9	75.3
B7-S10 Out (W.Bluffs)	486	417	1350	1215	50.0	46.1
Hanford Out	64	55	300**	300**	30.0	24.7
TOTAL OUT	2164	2152	4770**	4515**	63.0	64.1
HANFORD IN	3552	2298(1)	12600*	12400(2)*	39.1	24.9
Project Total						
230 KV Out	64050	67640	108300**	112500**	82.1	80.8
115 KV Out	13466	12053	31654**	28000**	59.1	57.9
66 KV Out	2164	2152	4770**	4515**	63.0	64.1
TOTAL OUT	79680	81845	144724**	145015**	76.5	75.9
230 KV In	64795	68236	105600*	108000*	85.2	84.9
115 KV In	13940	12320	36000**	49200**	53.8	33.6
66 KV In	3552	2298(1)	12600**	12400(2)**	39.1	24.9
TOTAL IN	82287	82854(1)	154200	169600(2)	74.1	65.7

* Denotes Coincidental Demand
** Denotes Non-Coincidental Demand
(1) Includes 172 MWH of "K" Test Power
(2) Includes approximately 8160 KW of "K" Test Demand

Average Power Factor - 230 KV System 91.2
Average Power Factor - 115 KV System 88.0
Average Power Factor - 66 KV System 76.3



PLANT AUXILIARY OPERATIONS DEPARTMENT
OPERATIONS ANALYSIS SECTION

MONTHLY REPORT - MAY, 1954

Personnel Statistics

Following is the month end summary of personnel:

Operations Analysis Section

	As of 4-30-54			As of 5-31-54			Net Change		
Unit	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	1	1	2	1	1	2	0	0	0
Applied Mathematics	21	4	25	19	4	23	-2	0	-2
Computing	6	46	52	6	44	50	0	-2	-2
Graphics	1	10	11	1	9	10	0	-1	-1
Procedures	11	3	14	12	3	15	+1	0	+1
TOTAL	40	64	104	39	61	100	-1	-3	-4

Applied Mathematics Unit

	As of 4-30-54			As of 5-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	2	3	1	2	3	0	0	0
Administrative Statistics	5	0	5	8	0	8	-2	0	-2
Technical Statistics	5	0	5						
Mathematical Analysis	3	0	3	3	0	3	0	0	0
Numerical Analysis	7	2	9	7	2	9	0	0	0
TOTAL	21	4	25	19	4	23	-2	0	-2

F. H. Tingey terminated on May 21 to accept a position with Phillips Petroleum Company at Idaho Falls, Idaho. Concurrent with his termination, the Technical Statistics and Administrative Statistics functions were combined into a single function to be known as the Statistical Analysis function.

V. A. Clark terminated on May 28 to accompany her husband at graduate school.

J. A. Merrill spent May 3 and 4 in Los Angeles, California in connection with the establishment of two statistical sampling plans for acceptance inspection.

L. W. Smith attended the Second Annual Meeting of the Operations Research Society of America in Chicago, Illinois on May 21 and 22. Following this he visited AGT and ANP in Evendale and the Case and Carnegie Institutes of Technology in connection with production scheduling.

Computing Unit

	As of 4-30-54			As of 5-31-54			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	19	20	0	-2	-2
Machine Processing	3	20	23	3	20	23	0	0	0
TOTAL	6	46	52	6	44	50	0	-2	-2

One Office Machine Operator was transferred to the Engineering Department effective 5-10-54. One Office Machine Operator terminated effective 5-21-54.

Graphics Unit

	As of 4-30-54			As of 5-31-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	2	3	1	2	3	0	0	0
Illustrators	0	6	6	0	5	5	0	-1	-1
Graphic Designers	0	2	2	0	2	2	0	0	0
TOTAL	1	10	11	1	9	10	0	-1	-1

One graphic illustrator terminated effective 5-14-54.

Procedures Unit

	As of 4-30-54			As of 5-31-54			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	2	2	0	0	0
Operations Analysts	10	0	10	11	0	11	+1	0	+1
	11	3	14	12	3	15	+1	0	+1

One Operations Analyst was transferred from the Manufacturing Department to the Procedures Unit effective 5-1-54.

H. Tellier attended the Records Management Conference of the Atomic Energy Commission in Washington, D. C. on May 17,18, and 19. Following this he visited the Major Appliance Division in Louisville, Kentucky and attended the Second Annual Meeting of the Operations Research Society of America in Chicago, Illinois.

[redacted]

FOR THE MANUFACTURING DEPARTMENT

A new operations research program to investigate methods of production scheduling was started this month. A simplified mathematical dynamic linear programming model of 100 and 200 area operations has been constructed as a basis for study and evaluation of the effectiveness of this technique. The advantage of this technique over others is that it not only determines the possibility of production programs, but it will allow optimization of the programs within the necessary restrictions.

An analysis of Mallinckrodt and Fernald metal quality data was carried out at the request of the Metal Preparation Section in connection with the specification of ingot density. Data on material received and processed since November 1, 1953 were reviewed, and distributions of both top and bottom ingot densities prepared. On the basis of these distributions, it was determined that the minimum density specification could be raised without causing undue loss by rejection. Thus, a more precise control limit has been established.

The development of a new tabulator panel for printing two-digit pile maps has been completed. The new maps are printed with standard typewriter spacing on a much smaller and more compact form than previously used. Provision was made for printing alphabetic as well as numeric information, thereby making it possible to designate certain tubes in the pile by coded characters, such as A for air-tube and P for poison column. It is felt the new format will prove more convenient than the original one.

In connection with the attempt to correlate slug rupture rate and power and exposure in C-reactor, a frequency distribution was prepared showing the amounts of metal processed at C-reactor since start-up within various intervals of power and exposure. From this distribution, rupture rates were calculated which differ somewhat from those expected, but which have been shown to be statistically valid. The problem was complicated by the fact that during the time period covered by the data, the pile had operated at four distinct power levels, and hence the calculation of power level for a given tube became somewhat involved. There is some question as to whether or not one should consider average power, maximum power, or some other function of power when analyzing for a power effect. (Secret Rough Draft: "Rupture Rate vs. Exposure for Fixed Power Level", to C. W. Botsford.)

Experience river flow data since 1913 were tabulated in order to study the distribution of two aspects of the data-- the date on which maximum flow occurred, and the magnitude of this maximum flow. The results were reported to the Maintenance Sub-Section.

The further analysis of attitude survey data for the Metal Preparation Section has been completed. Attitudes of employees in the various personnel classes within each sub-section were analyzed separately. In addition, a summary of all comments written on their questionnaires by these employees was prepared. (Report: Attitude Survey Results-Metal Preparation Section", to W. M. Mathis.)

Work on the Redox Model Project, under construction by Graphics for the Separation Section, was temporarily stopped in order that available model personnel could be assigned to higher priority work. However, this month final assembly of the building walls and general frame work was completed. Some progress in fabrication of operating equipment was made and every effort will be made to effect an early completion date.

Other graphics services for the Manufacturing Department included completion of eight visual aids on canning processes; completion of two Radiation Monitoring control charts; and posting current data to and issuance of the Manufacturing Department Control Charts.

Preliminary work on the study of Separation Section production data was continued. A few supervisors were interviewed to ascertain some of the general problems that may arise in the detailed study. It was decided to postpone the detailed study until the pending reorganizations are completed.

For the Manufacturing Department 3 routine IBM reports and 5 non-routine jobs were completed for a total of 8 IBM service requests.

FOR THE ENGINEERING DEPARTMENT

Chemical analyses for both Mallinckrodt Chemical Works, MCW, and Feed Materials Production Center, FMPC, were analyzed for recent trends and production variation of impurity content. The purpose of this study was to determine if the recent high TDS values could be explained by increases in measurable impurity content of the metal. The results were reported orally to the Uranium Development Group of the Pile Fuels Sub-Section, and then incorporated in the metal quality report mentioned in the following paragraph.

A report covering the quality of metal cast at both FMPC and MCW has been issued. (Document: HW-31246, "Summary of FMPC and MCW Metal Quality - July 1953 through April 1954", dated May 17, 1954.) This report covers several means of measuring the quality of the metal received at HAPO. It includes chemical analyses, density, reactivity, metallurgical properties, dimensional characteristics, and limited information on slug ruptures as associated with metal quality.

A pile test comprised of two tubes of "outgassed" material and two tubes of "normal" material is to be performed. Limitations on the amount of information that it is possible to obtain and the interpretation of this information will be furnished the Uranium Development Group of the Pile Fuels Sub-Section.

Recently a machine (called the "woodsplitter") has been developed which by means of inducation heating, is hoped to simulate actual pile splitting conditions on a slug. An experimental design was suggested for testing the effects of beta heat treatment and outgassing to eliminate hydrogen on two different types of metal. When these tests are completed (i.e., the selected slugs have all been cycled through the machine until they have actually split) the data will be analyzed and the results reported to the Uranium Development Group of the Pile Fuels Sub-Section.

Further computational work was done on the warm canning press problem. One additional temperature distribution was assumed, and the resulting heat flow distribution was calculated and plotted. No additional work has been requested.

The relationship between the distance between atomic planes in graphite and the amount of exposure of the graphite is being estimated from experimental data for the Pile Material Unit of the Pile Technology Sub-Section. It is necessary to use a weighted regression fit since all of the measurements are not obtained with equal precision.

Past corrosion data pertaining to water type 40 were fitted by the "best" curve of a theoretical type involving five parameters and four independent variables. This theoretical curve had been developed by a member of Pile Technology Sub-Section in an attempt to work into one equation most of the important variables which are thought to affect corrosion. The results were reported to the Pile Coolant Studies group.

For the Fuel Technology Sub-Section, considerable corrosion data were to be fitted by a rather complicated exponential type curve involving two parameters. The statistical aspects of the problem were reviewed, and a suggestion for alternate estimation procedures was made. This suggestion is presently being carried out.

An attempt is being made to formulate an expression for the rate of corrosion of aluminum in water. From material balance considerations, it is possible to express in a differential equation the relation between the weights of solid aluminum, aluminum in film, and aluminum washed away. The two arbitrary constants which result from the solution of this equation are to be determined by fitting the solution to sets of data obtained from experiments on various aluminum alloys at various temperatures. The two-parameter fit is being made by two distinct methods for purposes of comparison; in addition, a one-parameter fit is being made in which the weight of aluminum washed away, apparently significant only at higher temperatures, is being neglected. The work is of fundamental importance in the continuing study of the corrosive properties of aluminum.

Additional data from the experiment on the galvanic corrosion of certain aluminum and zirconium alloys has been received and is being prepared for routine processing. Incidental corrections were made in some earlier data, and the data were recalculated. A modification of the procedure is being made to provide for the possibility of using a given galvanic cell for a different experimental run within a week's time.

Zirconium has some very desirable properties which would make it useful as an alloy for pile process tubes. However, zirconium has a major undesirable property of brittleness. It has been found that the addition of hydrogen to zirconium reduces its brittleness. A statistical experimental design is being developed which will result in obtaining information on the effects of different methods of adding hydrogen and different methods of testing the samples. This work is being performed for the Applied Research Sub-Section.

The relationship between slug rupture and tube rupture curves under various assumptions is being investigated for the Advance Technology Sub-Section. This work has been initiated due to apparent inconsistencies in the relationship between the two curves reported in previous work.

The first set of data on J-Q loaded tubes at H-reactor has been processed and a report issued. The report gives the daily tube power of 36 tubes, of which 13 actually carry the special loading. In addition, the cumulative exposure of the 13 J-Q tubes is shown. This report is the first of such to be issued routinely for approximately a six month period.

Work is continuing on the numerical evaluation of heavy isotope concentration as a function of time and flux. The concentrations of isotopes in the chain from U_{238} to Am_{241} were calculated for nine values of flux and two values of time for a total of 18 cases. Curves of the ratio of Pu_{240} to Pu_{239} vs. time were plotted for each flux value, and an attempt made to specify the time at which this ratio became equal to certain predetermined values, e.g., 0.05 and 0.08. The attempt was successful for low flux values, but correction will be necessary for high flux values, for which the characteristics of the build-up curves are altered considerably. In addition, two cases were run from which it is hoped the capture cross section of Np_{239} can be specified more precisely. Also calculated were the concentrations of isotopes in the chain from Th_{232} to U_{233}. These calculations were carried out for four values of flux, each for nine values of time. The results were tabulated in several ways. Later a request was received to compute the concentration of these isotopes after a decay period of 100 days had elapsed. By using the previously computed amounts as initial amounts, and setting the flux equal to zero, it was possible to use the same computational routine as before in determining the new concentrations.

The first attempt at the numerical solution of a set of highly nonlinear ordinary differential equations expressing the concentration of heavy isotopes as a function of exposure was unsuccessful. The integration of these equations was carried out satisfactorily step-by-step up to a certain exposure, at which point the solutions broke into uncontrolled oscillations. A study was then made of the method of solutions, which proved inadequate in regions where the solutions became sensitive. Consequently, a more refined method was programmed. A test case is presently being run using this method. Further work will follow only when the method proves to be satisfactory from an accuracy and stability standpoint.

A new and more accurate mathematical treatment of the exponential pile problem has been developed. The improved formulation differs from the one now being used in that the extraneous sources are assumed to emit fast neutrons (all at the same age) rather than thermal neutrons. There are two important advantages to the new approach: (1) the range in which the theoretical expression for the flux is sufficiently accurate is extended, which increases the number of points at which experimental measurements can be made; (2) the diffusion length and other experimentally determined quantities enter into the expression for the flux in a manner more nearly in accord with the fundamentals of nuclear reactor

theory. (HW-31886, "Neutron Flux Distribution from a Point Source in an Infinite Medium", and HW-31925, "Distribution of Thermal Neutrons from Fast Sources in Exponential Piles"). Additional computational work was performed on fitting curves to exponential pile data. Solutions for the first complete set of data were carried out, and more data will be processed in the near future.

Most of the planning work on the processing of data from the single-column experiment at C- reactor has been completed. The coded data is to be transcribed into actual numbers by means of calibration curves. Data on these curves are being received now, and analytic curves fitted to the data. Programming of these curves will take from two to three weeks; following this a dry run will be made for one week before beginning calculations on the actual experiment. Methods will also be developed to indicate when one of the instruments has changed enough to deviate significantly from its original calibration curve.

An extensive tabulation of certain integrals arising in the transport theory of neutron diffusion has been completed. One of these integrals has fundamental value in general applications of the theory, while the others will be used for more specialized purposes. The integrals were evaluated by summing their equivalent infinite series. The slowly converging series were evaluated on the 605 calculator, and later combined with the other series on the card-programmed-calculator. An extensive check on the accuracy of the computations was made through the use of the general-purpose differencing system. A number of errors were detected in this manner, and corrected.

The computation of flattening weighting factors in a spherical pile was undertaken and completed. These weighting factors were expressed as definite integrals, some of which were evaluated analytically, and the remainder of which required numerical integration. The integrals were computed using two different approximations to the flux in a spherical pile to make available a comparison of the accuracy and suitability of these expressions for the flux. A more important comparison will be made between the weighting factors computed for a spherical pile and those computed in the past for a cylindrical pile. One result of this comparison will be a decision on which model of the actual Hanford pile lends itself more readily to accurate and convenient flattening calculations.

Additional work has been done for the Advanced Technology Sub-Section on the Wilkins integral equation, which describes the velocity distribution of thermal neutrons for a given temperature. It is now planned to approximate the integral equation by a system of linear simultaneous equations, and to solve these by the Gauss-Seidel method. This particular problem prompted research in methodology the result of which should be useful in many future situations.

At the request of the Radio Chemistry Group, a formula has been derived for the mean chord in a cylinder, assuming that each chord is the path length of a beta particle emitted from some point on the lateral surface. It was assumed that the source distribution on this surface was uniform and that the particles were emitted isotropically. The result obtained will be used in a broader problem concerning the control of beta radiation.

A nonlinear equation of the second order was studied for the Design Analysis Group. A scheme was devised whereby the solution could be obtained by two successive numerical-iterative procedures. The result will be applied to the description of the pressure decay in a steam pump when a failure occurs.

Preliminary investigations have been made and several conferences have been arranged to determine the feasibility of attacking the problem of heat flow in a reactor annulus by a new method. Unique in this method is the consideration of heat transfer by turbulent action as well as by molecular diffusion.

At the request of personnel of the Inspection and Materials Unit of the Project Section, statistical sampling plans were drawn up and recommended for use in acceptance sampling of 100-K connectors and 8" expendable dummies. Before the inauguration of a statistical sampling plan to the inspection of the connectors, the G.E. inspector was spending 8½ hours a day inspecting the units on a 100% basis. After the installation of the statistical sampling plan, his work should have been reduced to an average of approximately two hours a day since a sample of slightly less than 20% of the units was proposed. The recommended sampling plans belonged to the class of plans which insure the percentage of defective material present in the lots finally accepted to be less than or equal to a predetermined constant. In addition to cutting down the work load of the G. E. inspectors and thus saving manpower, statistical sampling plans, if used throughout our inspection operations, would give a consistent basis for sampling to insure the acceptance of material of a desired average quality. (Reports: "Recommended Procedure for Sampling Pigtails" to W. Crockett, and "Recommended Statistical Sampling Plan for the Inspection of 8" Expendable Perforated Aluminum Dummies" to W. W. Walker.)

A detailed analysis of attitudes of employees in the Engineering Administration Sub-Section has been completed. The only group of employees of sufficient size for analytical purposes was the nonexempt clerical-administrative employees (clerks and secretaries) in the Technical Information Unit. Their attitudes toward the eighty items in the questionnaire, and the eight general categories of items were analyzed, and a report was issued.

Results pertinent to the attitudes of employees in the various sub-sections in the Technical Section were derived from statistical analyses of attitude survey data. Personnel classes of employees within sub-sections were analyzed separately. A summary of the comments written on their questionnaires by these employees was also prepared. (Report: "Attitude Survey Result-Technical Section" to O. H. Greager.)

Routine computational work for the Engineering Department consisted of Group Nine Metal Studies calculations for March and Special Request Exposure calculations for May.

A meeting was held with Office Unit supervision to discuss the problem of duplicating classified copies. A small ozalid and a photocopy machine were recommended to facilitate reproduction of additional classified copies. This recommendation was approved and was referred to the Office Unit for determination of the brands to be ordered and for procurement of these machines.

Two reports were made to Classified File supervision. One report covered the responsibilities of the Files personnel and the various chargees in the inventory of classified copies at Hanford. The other report gave the status of needed policy decisions for the conversion of Classified File records to punched cards.

Several meetings were held with Classified Files supervision in connection with the conversion and operation of the classified copy control system. These meetings were for the purpose of making detail procedural plans and for discussing policy problems Also, a device to automatically advance continuous form paper in a typewriter was demonstrated.

The conversion of Classified Files to a punched card system is continuing. The current status of key punching is as follows: "S charge" group of documents was begun; "3", "7", GEH, and DUH groups of documents have been completed; "offsite" number series have been started. The assignment of special control numbers for the "offsite" series has necessitated considerable special processing. However, without control numbers these groups cannot economically be machine processed.

Special graphics services performed for the Engineering Department included further development and installation of piping, valves and equipment in the Operating and Sample Galleries for the Purex Model; completion of a perspective drawing and a schematic layout of the 100-C Slug Examination Facility; completion of a perspective cut-a-way drawing showing equipment and mechanism design of the "In Line Alpha Monitor Unit"; and development of a series of colored illustrations showing a typical separations plant and equipment.

Graphics services for the Applied Research Sub-Section included completion of illustrations for a report titled "Ion-Exchange Membrane Salt Bridges"; preparation of a schematic diagram of the "Photometer Components" and a block diagram of "Components of Extraction Rate Instrument"; preparation of photocopy for document HW-31799 titled "Quarterly Progress Report for the Metallurgy Unit"; preparation of three figures for a report titled "Buckling vs Graphite Uranium Ratio"; five tables for a report titled "Electrodeposition of Pu"; completion of charts for document HW-31351 titled "Crossover Point Buckling and Slug Radius vs. Graphite - Uranium Ratio at the Crossover Point"; and photo mounting for touch-up of eight plates for document HW-31430.

Graphics work for Fuel Technology include photo-mounting, touch-up and finishing for document HW-31680 titled "The Pre-Irradiation Evaluation of High Alpha Rolled Uranium, etc."; photo-mounting and make-up of plates for document HW-31676 titled "Some Effects of Striation on Slug Quality"; preparation of photo-copy for document HW-31743 titled "Status of Fuel Element Development at Hanford for February and March 1954"; and completion of fifteen plates for slides on Purex Process Systems.

Graphics service for Pile Technology included preparation of graphs for document HW-31263 titled "Results of Some Out-of-Pile Water Quality Tests Conducted at 120°C"; completion of three graphs for document HW-31504 titled "Tube Life Effect on Pile Power Level"; and preparation of photo-copy for document HW-31397 titled "Final Report-Design Test # 47".

Graphics work for Separations Technology included preparation of six drawings with the following titles: (1) 234-5 Building Ventilation System; (2) Dry Chemistry - Time - Temperature Cycle; (3) Flow Sheet - Machining; (4) Reactivity of PuO_2 in HF Percent Reacted vs. Temperature; (5) Gas Pressure vs. Time For Typical Coating Cycle; and (6) Sphincter Seal Access Port.

22 non-routine IBM jobs were completed for the Engineering Department.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

Progress Report 1 was issued for the Electrical Distribution Operations program during the month. This report surveys the background of certain questions that have been raised and presents the bases for management decisions of them. (Document: HW-31691, "Electrical Distribution For the Outer Areas - Progress Report 1.)

A follow-up study has been made of the occurrence of incompleted telephone calls in the Richland exchange in order to evaluate the effectiveness of the recent regrading recommended in Telephone Operations Progress Report 1. The follow-up study indicated that a substantial improvement in telephone service has resulted from the regrading. A significant reduction of second selector losses from 4.1 to 2.5% was observed. Of the four levels in the exchange, the greatest improvement was in the heavily loaded fourth level. Within this level, the greatest improvement was in second selectors 41 through 50, the observed loss being reduced from 26 to 10%. These changes should result in the elimination of approximately 380,000 lost calls over the one year period remaining until completion of the additional Richland exchange. The results were reported in Telephone Operations Progress Report 2.

Work is continuing on the third phase of the program--an economic analysis of the number of leased lines justified for plant use in making long distance telephone calls.

Significant progress was made on two phases of the Inventory Control Operations Research Program. The first was an investigation of the dollar value trends of general supplies, spare parts, and excess inventories since June of 1952. The second study, which is continuing, involves an investigation of utilization of Area Stores vs. Central Stores.

A systems model for the control of Spare Parts and Spare Equipment inventories was developed. This model defines the responsibilities of the various groups and indicates assigned functions. The purpose of the system is to supply the various departments and sections with the information needed to efficiently perform these assigned functions.

Work is continuing on the Transportation Operations Research Program. The utilization of vehicles in the Reactor Section (100 Areas) is currently under study. A full weeks activity of vehicles within the areas was recorded on marksense cards. The recorded data is being analyzed to determine trips, movements, utilization, etc., of all passenger vehicles within these areas. The results and methods devised from this study will be applied to a plant wide study.

The accumulation of base data concerning the physical and operating structure of the Transportation Section has been started. First consideration will be given to the area bus functions and the assigned vehicle functions in the sedan, pickup, station wagon, and carry all classifications. A record has been compiled of assigned vehicles showing vehicle number, assigned organization, and building location from which normal operation occurs. A weeks summary has been prepared by shift of the people transported to and from the various remote areas.

Research work was done on the problem of obtaining automatic recording devices with emphasis on those machines which prepare a record that can be mechanically read. Preliminary information was obtained on an automatic programmed typewriter and an adding machine which prepare punched paper tapes as well as performing their normal functions. Further vendor contacts are scheduled on these products.

A survey was made of the space utilization of area stores in the 100 and 200 areas. This survey indicates a relatively low utilization of space. A survey was also made of the spare parts storage space in the 100 areas. It was recommended that additional space be obtained in warehouse 1713-A from Reactor Operations, thus making possible the storage of spare reactor tubes from the K Reactors.

A report of invention has been submitted by F. W. Richardson to the Supervisor-Contracts, Engineering Department covering the concept of adapting the standard 4' x 4' x 5" material handling pallet to cubical storage of miscellaneous shaped material by utilizing clamp-on pallet legs.

Fifteen new or revised IBM internal operating procedures were prepared for the Computing Unit by the Procedures Unit.

Special graphics services for the Operations Research programs included preparation of flow charts, graphs and illustrations as requested for the following problems: (1) File Operation; (2) Electrical Sub-Station Operation; (3) Data Processing; (4) Inventory Control (Including Spare Parts Storage, Standby Inventory, Area Stores, and Systems studies).

For the Plant Auxiliary Operations Department, 14 routine IBM machine reports were completed.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

A major result has been obtained in the work on the problem of contamination in the river downstream from the effluent ducts of retention basins. A mathematical expression for the concentration was derived for the idealized case of a channel with rectangular cross-section having a reasonably smooth distribution of velocities across the stream. As far as is known, this is the first time that such

a solution has been obtained in which the diffusion of materials by turbulent action has been considered. In order to apply these results to an actual river, a systematic mapping scheme has been devised which corresponds points in the river to points in the channel. Considerable statistical and computational work remains to be done to carry to completion this correspondence. In addition, the complexity of the mathematical functions involved in the solution requires the preparation of two auxiliary tables.

The report on existing procedures and operations of the Exposure Record Unit has been completed. The problems involved in this operation were recognized to be of sufficient scope and magnitude as to justify the inclusion of this study in the Operations Research Project on Data Processing. Attempts are presently being made to determine the feasibility of immediate application of machine methods to the existing procedures. One notable possibility is the daily recording of pencil meter readings on mark-sense card forms. This would result in a drastic reduction in data transcription time and volume. At the same time, difficulties inherent to this new method of recording have been encountered and considerable additional planning will be required before effecting any changes.

Statistical analyses on a long-term experiment studying the effects of low level feeding of I^{131} on the blood of Suffolk ewes and their offsprings has been brought up-to-date. The information was punched on IBM cards and the average bi-monthly effects for the original ewes and two generations of offsprings since 1950 were computed. Confidence intervals were placed on these averages for the twenty blood constituents studied. These results will supply pertinent information for radiological health standards. Tables and an oral report were presented to the Biology Control Unit.

In addition to the routine feeding, high concentrations of I^{131} were fed to some animals, and analyses are being performed to determine at what time after the feeding began significant changes occurred in three important blood constituents. Several intermediate concentrations of I^{131} were fed to other sheep to determine the dose effect of several blood constituents. Trends in the blood values resulting from the feeding will be investigated. These results will also be useful in setting radiological health standards.

Routine computational work for the Radiological Sciences Department consisted of thyroid and radioanalysis calculations, Aquatic Biology calculations, weather calculations for April, and wind calculations for April. In addition, a request was received for a detailed summary of four years' radioanalysis data. On a similar summary of thyroid data, some 2000 corrections were made, and the summary rerun.

Graphics work for the Biology Section included preparation of charts and

tables for slides to be used in a lecture on "Centration of Tritium in Combustion Water from Compound Fractions of Rats Chronically Exposed to Tritium Oxide"; Preparation of slide material for (1) "Comparison of Radioactivity in Different Types of River Organisms"; (2) "Seasonal Fluctuations in Radioactivity Related to River Flow and Temperature"; (3) "Diminishing Radioactivity with Distances Downstream"; and completion of a perspective drawing of the Aquatic Biology Building showing in detail the working areas and equipment within the building. A request was also submitted to Graphics for a rush job in preparing six plates for slides on the subject "Relative Biological Effectiveness of Ionizing Radiations by a Microbiological Method."

Five routine IBM reports and 3 non-routine jobs, a total of 8 IBM service requests were completed for the Radiological Sciences Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

Data compiled on employees with high frequencies of absenteeism during the first three months of this year is presently being analyzed statistically for the Industrial Medical Unit.

The location of various records concerning company employees was discussed with Personnel Practices supervision. Previously information on this subject was obtained from Personnel Accounting, Security and Patrol, Manufacturing Administration Sub-Section, and Engineering Administration Sub-Section. The information gained from these various sources is being combined into an Operations Research report to Management.

Procedures were prepared to list exempt and non-exempt employees. The employees were grouped within General Electric continuity of service date groups by payroll number within organization. The listings were used in the awarding of the Service Recognition pins.

Listings were made of exempt and non-exempt female employees who had reached the age of 50 years or more as of May 17, 1954. This listing will be used in reviewing pension records of women employees eligible for retirement within the next five years.

Two special listings were prepared for the Exempt Salary Administration. One was a listing, by section, of exempt employees within grades. The other was a listing of Manufacturing Department exempt employees.

Graphics work for the Employee and Public Relations Department included layout, inking and make-up of the latest revised HAPO organization charts; preparation of visual aids for the Kadlec Hospital Open House program; completion of eighteen Injury Control Charts for the Health and Safety Section; preparation of photocopy for the Photo Unit; and hand lettering sixty-five names on P.M.S. Program Cards for the Training Unit.

For the Employee and Public Relations Department 40 routine reports and 5 non-routine jobs were completed for a total of 45 IBM service requests.

FOR THE FINANCIAL DEPARTMENT

Work was started on the construction of a 20-by-20 input-output table for the dollar costs at HAPO. Discussions were held with personnel of the Financial Department on the potential usefulness of the analysis of this table and on the data from which it will be constructed. The Financial Department is presently gathering data for this table.

Payroll procedures are being expanded to go into effect coincident with the use of the new continuous form cards checks and earnings statements. This expansion includes a new vacation calculation procedure which will handle the split of Sunday and Monday holiday premiums between two weekly payroll perids. Explanations of adjustments to gross earnings will appear on earnings statements and on the "Weekly Salary Roll". Paper deposit slips will be printed for employees who have their pay check deposited directly in local banks. The expected receiving date has been extended to the middle of August for the continuous form checks and earnings statement. This will delay the installation of the above changes which had been scheduled for July 1st.

The June 10th wage increase imposes certain technical difficulties as the effective date does not occur on the end of a weekly pay period. It will be necessary to record and calculate the two portions of that pay period separately using the two rates. A further complication is the uncertainity of approval dates and the liklihood that approvals by the Unions and the AEC may come after the completion of the payrolls for the week including June 10. Procedures are being outlined to cover all known probabilities.

Special reports were prepared from payroll records. A listing was made of the Exempt Payroll showing the employee within Salary Group with Salary Plan within Department. Wage rate statistics were prepared for weekly employees by annual wage rates to be used in the compilation of salary rate statistics. Tax and pension deducted listings were prepared for patro. .en receiving retroactive payment. Weekly earnings statements were also prepared for these payments to be included in payment envelopes.

The statistical methods used in determining the relationship between g/t and MWD/t and establishing the precision associated with this curve, as reported in HW-30990, will be presented in a detailed report now being prepared.

An initial study of recently collected empirical "F" factors for material processed through the Redox plant indicates a significant nonrandom time-wise variation in these factors. Several sources of such nonrandom variation have been noted and reported to personnel of the Measurement Methods Unit of the S. F. Accountability Section.

Based on recent data, tolerance limits for 234-5 building machining overages and underages have been calculated at the request of personnel of the Measurement Methods Unit. A preliminary oral report of the results was given.

Work is being continued on the problem of statistically fitting a calibration curve to the original calibration data for tank 15-6.

Work is also being continued to obtain an objective method of determining what are reasonable shipper-receiver differences for off-site nitrate shipments due to the random errors inherent in the method of chemical analysis.

For the Financial Department 532 routine IBM machine reports and 21 non-routine jobs were completed for a total of 553 service requests. In addition, 25,593 paychecks and 25,593 earnings statements were prepared and 25,476 cancelled paychecks were reconciled.

FOR THE ATOMIC ENERGY COMMISSION

Two methods for determining the amount of gas discharged into the atomosphere from stacks were compared. One method is based on theoretical considerations from an analysis made near the beginning of the process. The other method consists of analyzing the atmospheric discharge itself. This latter analytical method gives rise to a smaller calculated value since it reflects loss between the point of theoretical calculation and the point of analysis. The problem consisted of estimating the loss between the two determination points, and of determining the measurement precisions of the two methods.

The April Hanford Release report was turned out on schedule. Some modifications of the computational scheme will be made before processing the data for May.

SUMMARY

During the month of May 126 statistical, mathematical, procedural, and graphical problems were completed, and as of May 31, a backlog of 201 problems were on hand. In addition 594 routine IBM reports and 56 non-routine IBM jobs were completed for a total of 650 IBM service requests; 25,593 paychecks, 25,593 earning statements were prepared, and 25,476 cancelled paychecks were reconciled.

A total of 99 new forms were designed, 347 orders for forms were received of which 3 were rejected and 344 were approved for a total of 906,675 copies.

Department Serviced	Percent of Services Rendered				
	Units				Operations Analysis Section
	Applied Mathematics	Procedures	Computing	Graphics	
Manufacturing	13	2	2	10	6
Engineering	38	15	26	38	29
Plant Auxiliary Operations	1	10	4	1	3
TOTAL OPERATING DEPARTMENTS	52	27	32	49	38
Radiological Sciences	14	0	2	12	8
Employee & Public Relations	0	3	1	11	2
Financial	5	11	63	3	34
TOTAL STAFF DEPARTMENTS	19	14	66	26	44
A. E. C.	5	1	2	0	2
General Administrative	24	58	0	25	16
TOTAL	100	100	100	100	100