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MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

JUNE 1954

Compiled By
DEPARTMENT MANAGERS

July 26, 1954

RICHLAND, WASHINGTON

Operated for the Atomic Energy Commission
by the
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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

JUNE 1954

GENERAL SUMMARY

Production Operations

In the Metal Preparations Section production of normal material for the month was 100 percent of forecast. The overall canning yield for June was 81 percent.

The total reactor input plutonium production was 136 percent of the official forecast for the month. The output production was 125 percent of forecast. During the month a total of 22 uranium and six "J" slugs failed in the reactors.

Redox production for June was 66 percent of the official forecast and the T Plant production was 104 percent of forecast. TBP production was 122 percent of official forecast. UO_3 facility production was 128 percent of forecast. All commitments for 234-5 production were met.

Engineering Technology

Project CA-514, 300 Area Expansion design was completed during the month, with the exception of new items of equipment and design field liaison. Activity on Project CA-513, Purex Tank Farm condenser revisions, continued on a priority basis. Design for the new contact condenser was advanced to 20 percent completion.

Authorization of Project CG-558, Reactor Plant Modifications for Increased Production, totaling $26,800,000, was received from the AEC on June 15, 1954. The directive included authorization to provide design for maximum process water flow at F & H Reactors. A revised project proposal incorporating the changes imposed by the directive, is being prepared.

Twenty informal, nine Class I and no Class II radiation incidents were recorded.

Personnel and Services

There were no major injuries recorded during the month of June. There were 284 minor injuries during the month, as compared with 289 in May.

The employee separation rate increased from .64 percent for May to 1.19 percent for June.

As of June 30 there were 306 housing applications pending.

The congressional hearing on disposal legislation was held at the Columbia High School on June 18 abd 19. It is felt that passage of disposal legislation this year is doubtful.

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
JUNE 30, 1954

	EXEMPT		OTHER		TOTAL	
	6-30-54	5-31-54	6-30-54	5-31-54	6-30-54	5-31-54
Engineering Department						
General	19	18	77	74	96	92
Design	171	171	130	129	301	300
Project	272	270	155	169	427	439
Technical Section						
General	10	10	3	2	13	12
Applied Research	120	121	54	52	174	173
Separations Technology	116	116	40	39	156	155
Pile Technology	106	105	66	66	172	171
Fuel Technology	72	73	73	70	145	143
Advance Technology	11	11	1	1	12	12
Manufacturing Department						
General	15	15	7	7	22	22
Reactor	273	267	1 156	1 129	1 429	1 396
Separations	285	288	1 248	1 264	1 533	1 552
Metal Preparation	98	97	461	450	559	547
Plant Auxiliary Operations Department						
General	1	1	1	1	2	2
Elec. Dist. & Telephone	30	30	137	139	167	169
Transportation	44	44	447	443	491	487
Purchasing & Stores	56	54	235	229	291	283
Plant Protection						
General	1	1	1	1	2	2
Patrol & Security	59	59	439	441	498	500
Safety & Fire	30	30	106	107	136	137
Office Services	13	13	197	177	210	190
Administration Main. Service	12	12	86	86	98	98
Operations Analysis	38	39	65	61	103	100
Financial Department						
Financial General	6	6	8	4	14	10
Costs & Budgets	27	26	98	99	125	125
General & Personnel Accounting	18	18	113	113	131	131
Property Accounting	16	16	41	41	57	57
Audits & Procedures	18	18	4	3	22	21
SF Accountability	6	5	20	20	26	25
Employee & Public Relations Dept.						
Community Operations	67	68	184	177	251	245
Real Estate Services	22	22	158	162	180	184
Health & Safety	54	54	211	211	265	265
Management	7	7	2	2	9	9
Salary Administration	5	5	6	6	11	11
Employee Relations	20	21	39	40	59	61
Public Relations	4	4	21	22	25	26
Union Relations	8	8	7	8	15	16
Technical Personnel						
Staff	4	4	6	6	10	10
Others	-	-	72	46	72	46

	EXEMPT		OTHER		TOTAL	
	6-30-54	5-31-54	6-30-54	5-31-54	6-30-54	5-31-
Radiological Sciences Department						
General	3	3	3	3	6	
Records & Standards	27	28	142	141	169	16
Biophysics	58	58	60	59	118	11
Biology	33	34	39	38	72	7
Engineering	6	6	1	1	7	
Legal	3	3	2	2	5	
Special Study	3		2	2	5	
Total	2 267	2 262	6 424	6 343	8 671	8 60

AREA PERSONNEL DISTRIBUTION
JUNE 30, 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	28	82	-	13	49	-	76	54	262	333	897
Other	18	29	2	47	20	-	9	28	211	235	599
Total	46	111	2	60	69	-	85	82	473	568	1 496
Manufacturing Department											
Exempt	79	59	55	74	14	-	8	260	98	24	671
Other	282	269	438	173	18	-	95	1 126	460	11	2 872
Total	361	328	493	247	32	-	103	1 386	558	35	3 543
Plant Auxiliary Operations											
Exempt	26	7	8	7	7	-	11	17	11	190	284
Other	55	54	81	59	70	11	64	161	100	1 059	1 714
Total	81	61	89	66	77	11	75	178	111	1 249	1 998
Financial Department											
Exempt	-	-	-	1	-	-	1	2	5	82	91
Other	-	-	3	2	-	-	2	1	16	260	284
Total	-	-	3	3	-	-	3	3	21	342	375
Employee & Public Relations											
Exempt	-	2	-	1	-	-	4	2	2	180	191
Other	4	10	12	4	3	-	3	6	23	641	706
Total	4	12	12	5	3	-	7	8	25	821	897
Radiological Sciences Department											
Exempt	1	-	34	-	-	-	2	17	62	11	127
Other	7	-	40	-	-	-	6	17	158	17	245
Total	8	-	74	-	-	-	8	34	220	28	372
General											
Exempt	-	-	-	-	-	-	-	-	-	6	6
Other	-	-	-	-	-	-	-	-	-	4	4
Total	-	-	-	-	-	-	-	-	-	10	10
Total Exempt	134	150	97	96	70	-	102	352	440	826	2 267
Total Other	366	362	576	285	111	11	179	1 339	968	2 227	6 424
GRAND TOTAL	500	512	673	381	181	11	281	1 691	1 408	3 053	8 691

D-L

MANUFACTURING DEPARTMENT

JUNE, 1954

METAL PREPARATION SECTION

The net production of acceptable slugs in June was 285 tons which was 100 percent of the official forecast. Five tons of material were canned as four-inch slugs. The canning yield was 74.2 percent for the four-inch and 81.3 percent for the eight-inch slugs with an overall canning yield of 81 percent.

The canning of thorium continued with 1367 acceptable slugs being produced at a canning yield of 60 percent. The principal difficulty encountered was wrinkled cans which resulted from oversized wafers.

There were no autoclave failures during the month.

REACTOR SECTION

The total input plutonium production was 136 percent of the official forecast for the month and 113 percent for the quarter. The output production was 125 percent of the forecast for the month and 123 percent for the quarter. The monthly input production exceeded the forecast principally because of the improved overall time operated efficiency which was 86.6 percent as compared to 80.3 percent for last month. Higher than forecasted operating levels and the postponement of a one week outage at H reactor also contributed to this higher than forecasted production.

The established maximum operating levels, excluding enrichment burnout, were increased a total of 107 MW. This increase (Pu and tritium) was attained as follows: 42 at the C reactor as a result of raising the tube power limits and 65 at the B reactor as the combined result of raising the corrosion temperature limit, changes in the flattening pattern resulting from large discharges and a process test allowing the reactor to operate on trip-before-boiling limits.

The discharge of the low and high concentrations was 20 and 260 tons respectively. Low concentration material was significantly lower than forecast because of the changes in the 200 Area requirements for this type of material as a result of production test scheduling at T plant. The total amounts discharged were greater than forecasted because of accelerated discharge of the higher concentration uranium from the C reactor in converting to a program of low concentration production.

During the month 22 uranium and six J slugs failed in the reactors and required an unusually low downtime of approximately 160 hours for removal. Three four-inch and one eight-inch slugs failed in the F reactor, and 18 eight-inch slugs failed in the C reactor. The six J ruptures occurred at DR reactor.

REACTOR SECTION (Continued)

During the month 24 reactor scrams occurred. Of these, 16 were caused by normal panellit system difficulties at B, C, D, DR and H reactors. Five scrams at H reactor were caused by flow difficulties on recirculation tube 0961-H (PT-105-506-E, "Recirculation Studies"). DR reactor was scrammed for 2.2 hours on June 16 by a partially plugged cone screen. One scram at F reactor occurred when the power level recorder was turned off to permit a battery change. Investigation of the faulty circuit is planned for the next outage. One scram occurred at D reactor when a pump supplying filtered water to tube 2171-D (PT-105-525-E, "The Effects of Water Quality on Pile Operation") failed. Total outage time charged to these scrams was 8.1 hours.

An approximate 32 hour process tube leak testing outage was scheduled at B reactor starting June 20 as the result of abnormally high drier room water collection rates. During the testing of 333 tubes, one major and nine minor nozzle leaks were corrected. After the outage, water collection returned to normal.

During June, horizontal rod work decreased significantly as compared to the previous several months. At B reactor No. 6 rod, which was removed from service in May when it became stuck midway in the reactor, was returned to service after a one-half inch washer was removed from the gear box. Origin of the washer was not determined. No. B rod thimble in B reactor, found to be leaking in April, was replaced, and the rod returned to service. At F reactor a new thimble for No. A rod was installed, with the replacement of the rod scheduled during the next outage.

The 13 tube J-Q program at H reactor continued without incident.

The shipment of the irradiated J material continued throughout the month with 2100 pieces being casked and shipped.

The new alum-silicate facility at 183-D was completed and placed in operation. All 100 Area water treatment plants are now using this type of coagulant for water treatment.

During June one tube of eight-inch metal was charged-discharged from B while the reactor was in operation.

SEPARATIONS SECTION

The Redox production was 66 percent of the official forecast for the month and 116 percent for the quarter as a result of above forecast production in May. The T plant production of low g/t product for the month was 104 percent of the forecast.

SEPARATIONS SECTION (Continued)

The Redox plant was shut down on June 1 due to the failure of the first cycle feed pump. Operations were resumed on June 3. An operating rate of seven tons per day continued until June 6 when a plugged salt waste line dictated another shutdown. Following the removal of the obstruction, processing continued until June 9, when the plant was shut down for the major equipment changes associated with the Phase II program, oxidizer off-gas treatment and jumper installation for the back cycling of the ANN solutions. At the end of the month essentially all the Phase II and back cycling work was completed with the exception of a few jumpers. The oxidizer off-gas treatment work remained to be finished in July. Difficulties with the 60 ton crane and delays caused by the decision to flush the stack had to some degree caused the program to fall behind schedule at month-end. The first attempt to flush the Redox stack on June 30 was halted when, following the exhaust fan shutdown, the air from the canyon carried contamination into the service part of the Redox building. A second attempt at stack flushing was scheduled for early in July. The facility downtime for the month was 567 hours, with 515 hours charged to the Phase II work and 52 hours to the first cycle feed pump failure and the plug in the salt waste line.

The TBP plant production was 122 percent of the official forecast for the month and 156 percent for the quarter. The operation was generally satisfactory except for an increase in concentration of DBP contaminant in the final uranium product. Extensive organic vessel flushings and organic washes were required to overcome the difficulty. The production rates averaged 3.5 and 3.8 tons per day for the A and B lines respectively. The total downtime during the month for the lines was 151 hours for the A line and 147 hours for the B line.

The waste removal rates were satisfactory, although at a somewhat reduced rate due to the necessity of cleaning out essentially empty tanks before moving to full tanks. A total of five tanks was officially declared empty during the month. The discarding of the first cycle waste in T farm into open ditches was completed.

The T plant operation was normal during this period with the processed material being all low concentration.

The UO_3 facility production was 128 percent of the official forecast for the month and 149 percent for the quarter. A total of 12 cars of powder were shipped offsite during the month.

The 234-5 production of shapes was

The waste evaporators operated throughout the month with volume reductions of 37 percent at B and 32 percent at T. The feed for both evaporators was TBP waste.

There was no production from the 108-B facility during the month.

[redacted]

GENERAL

Personnel

Total on Roll June 1, 1954	3523
Accessions	64*
Separations	39*
Total on Roll June 30, 1954	3548

*Does not include intra department transfers.

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

[redacted]

MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF JUNE, 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 expect as listed below. Such persons durther 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
Ralph E. Rugg, Reactor Section	"Improvement on Extensible Area Specimen Holder for R.C.A. Electron Microscope, Model EMU"

J. E. MAIDER, MANAGER

MANUFACTURING DEPARTMENT

[redacted]

MONTHLY OPERATING REPORT

JUNE 1954

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1.

July 8, 1954

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
June, 1954

I. RESPONSIBILITY

There was no change in responsibility during this period.

J ACHIEVEMENT

A. Operating Experience

1. Statistics

	June	May	Year To Date
Acceptable Pieces Canned (4")(Tons)Gross	6	30	122
Acceptable Pieces Canned (4")(Tons)Net	5	30	118
Canning Yield (4")(%)	74.2	79.4	70.3
Acceptable Pieces Canned (8")(Tons)Gross	284	210	1241
Acceptable Pieces Canned (8")(Tons)Net	280	209	1231
Canning Yield (8")(%)	81.3	83.5	79.3
Total Acceptable Pieces Canned (Tons)Gross	290	240	1363
Total Acceptable Pieces Canned (Tons)Net	285	239	1349
Acceptable Pieces Canned (4" and 8") (% of Forecast)	98	93	92
Autoclave Frequency (4")(No./M)	.00	.00	.00
Autoclave Frequency (8")(No./M)	.00	.00	.01
J-3 Slugs Canned (pieces)	756	4243	35964
N Slugs Canned (pieces)	0	1941	33177
Chem. 10-66 Canned (pieces)	1367	0	2113
Special Request (man hours)	685	536	3417
305 Routine Tests (man hours)	251	393	2453
305 Special Tests (man hours)	595	405	6081
Average Steam Generated (M lbs/hr)	22.1	22.9	
Maximum Steam Generated (M lbs/hr)	38.0	42.0	
Total Steam Generated (M lbs)	15,900	16,800	
Coal Consumed (Tons)	1092	1141	
Sanitary Water from 3000 Area (Million gals.)	45.5	46.5	
Total Water from 3000 Area Average Rate (GPM)	1052	1042	
Chlorine Residual (ppm)	.35	.31	

2. Activities

The net production of acceptable slugs attained a record high of 285 tons of which 98% were eight-inch. There was no significant change in the eight-inch canning yields from the previous month.

The uranium slug core specifications (HW-30707) have reached the Fernald Area Office of the A.E.C. It is expected that the application of these specifications will result in improvement of slug soundness, in addition to maintaining other slug qualities at their present level.

Evaluation of uranium slug core reactivity from December 1953 through June 1954 indicates a definite downward trend which appears to correlate well with the decrease of ingot egg reactivity noted during the first half of the year. The cause of this deterioration of reactivity is being investigated by both Mallinckrodt Chemical Works and the Feed Material Production Center.

Annealed aluminum plugs driven into the boss of index-type caps have proved effective in excluding AlSi from the index mark. It is planned to use both indexed caps and plugs in the evaluation of the new facing lathes when they arrive.

Tests were run on the ultrasonic bond detector. This instrument detects a much smaller void than will the frost test machine and a counting device integrates all such areas detected. This instrument will not reject a slug for being off-center in the can or for having a thin can wall as is occasionally done by the frost test machine. This type of test instrument will be utilized as soon as a production model is available.

There were no autoclave failures during the month.

3. Special Operations

One thousand three hundred sixty-seven acceptable Chem. 10-66 slugs were canned with a yield of 60% which was lower than expected. The chief difficulty encountered was wrinkled cans which resulted from over-sized wafers.

A joint heat treating program between Fernald and Hanford is to be conducted to improve metal quality. The program will be initiated August 1, 1954 at Hanford and salt bath heat treating agitator equipment is required to fulfill operating requirements. Approval has been obtained to proceed with procurement of materials.

4. Schedule Variance

Because of the low inventory of bare slugs, all canning lines operated on a partial relief basis instead of full relief as scheduled. As a result, canned slug production was 2% below forecast.

B. Equipment Experience

1. Operating Continuity

Canning line efficiencies were 92%, a decrease of one percent from the previous month resulting primarily from failures of duplex agitators and canning jacks.

2. Inspection, Maintenance, and Replacements

A straight drive built around an automobile water pump seal was designed to improve the operation of the drive on the ultrasonic testers. Considerable trouble has been experienced with the original assemblies in lubrication, leakage and poor accessibility. These appear to be corrected.

The semi-automatic welder was placed in service on the finishing line. Efforts are being made to eliminate the difficulties which have resulted in higher-than-normal bad weld reject rate.

The fire detection system in the 325 Building was extended to provide protection to the mezzanine section of the basement.

C. Improvement Experience

1. Production Tests

PT-313-38MT "Canning of Cored Uranium Slugs" (HW-31900).
Three hundred hollow cored slugs were canned under the provisions of this test. No unusual incidents were observed during the canning operation.

PT-313-39MT "Canning of Several Thousand Uranium Powder Metal Compact Slugs" HW-31955.
A total of 3712 four-inch compact uranium powder slugs were canned. Considerable flaking of the material occurred, making it necessary for the operators to wear respirators.

2. Process Tests and Revisions

Chip guards have been installed on the facing lathes to reduce the marred surface rejects at this point and it is estimated that a savings of $1200 per month will be realized.

The use of a leather protector over the plastic gloves at the quench tank and facing lathes was initiated. In addition to a reduction in the safety hazards encountered at these stations, a resultant saving of $2950 annually will be effected.

Development work has shown that aluminum turnings from the facing lathes can be used to make up AlSi metal for the canning furnaces without any ill effect upon slug quality. The savings to be realized by the use of this scrap metal is estimated to be $850. per month.

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.

2. Material Variance

A small reduction of in-process inventory and the continued use of reclaimed steel sleeves is expected to decrease the cost of materials about .01 per unit.

3. Other Costs

Increased production of acceptable slugs and a slight reduction in maintenance are expected to reduce other costs about .02 per unit.

E. Plant Expansion

1. Project Status

Project CA-514 - "Expansion of 300 Area Production Facilities"
Design of the overall project is 97% complete, and construction 40% complete. The total funds authorized for this project is $5,085,000. Total project costs to date amount to $3,579,000.

Phase II construction on the 313 Building Addition is about 80% complete. Modification of the existing 313 Building (Phase III) is approximately 45% complete.

Installation of Process Equipment (Phase IV) is about 2% complete. Recent progress made in the development of ultrasonic bond testing has warranted a change in project scope, replacing frost testing equipment with mechanized ultrasonic bond testing units. It is currently planned to utilize the prototype ultrasonic unit on the first finishing line completed and the existing frost test unit on the second finishing line until the mechanized ultrasonic units are ready for installation.

The scheduled ready-for-use date of two canning lines and one finishing line in the 313 Building is August 15, 1954.

The west gatehouse was closed on June 14, 1954 and all area traffic directed to the 3701-L entrance on that date.

Work was started by Minor Construction forces on the renovation of the 3707-A Building as a Maintenance change house on June 28, 1954. The scope drawing for the layout of office space, First Aid and Patrol Headquarters in 3706 Building (SK-6115) has been approved and design is about 10% complete.

Project CG-573 - "Hanford 3X Program - 300 Area"
Scoping of the 3X facilities is about 90% complete, design 83%, and construction 87% complete. A final project proposal submitted last month has been approved by the A.E.C., excluding facilities for iriditing, bond testing and slurry recovery in the 313 Building. These facilities represented additions to the initial project scope and since MINT program has been completed, they cannot be justified as a part of this project. Funds requested in the project proposal amount to $960,000 as compared with $800,000 previously authorized by A.E.C. Directive No. HW-318. A deletion of the aforementioned facilities will result in an adjustment to the additional funds requested. Total project costs to date approximate $810,000.

1. Project Status (Continued)

Work is progressing on the installation of equipment in the 313 Building for hot press canning. The scheduled ready-for-use date has been deferred from July 1 to July 15, 1954.

No progress was made on the 303-J Building during this period, pending the authorization of additional funds.

2. Plant Engineering

Preliminary design has been completed on mechanically operated agitators for the beta heat treating of slugs.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-32050	Monthly Report, Process Sub-section, Metal Preparation Section, May 1954	EW O'Rorke	6-1-54

2. Non-Routine

HW-32030	Metal Preparation Section Evaluation of Fuel Slug Cores, April & May 1954	TD Naylor	6-1-54
HW-32084	Control of Rolling Process for HAPO Uranium	SM Gill	6-9-54
HW-32103	General Analytical Control Program I Analytical Results, Mallinckrodt Chemical Works	PR Anderson	6-10-54
HW-32104	General Analytical Control Program I Analytical Results, National Lead Company of Ohio	PR Anderson	6-10-54
HW-32184	Hanford Smooth Slug Casting History of "G" and "A" Lots	SM Gill	6-21-54

III. PERSONNEL

A. Organization

No change.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations	193	198	5
Power & Maintenance	286	292	6
Process	42	43	1
Plant Engineering	23	22	-1
Section Total	548	559	11

C. Safety Experience

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

D. Radiation Experience

Two exposures in excess of 300 mrads per week occurred in the Zyglo operation. An extensive exposure rate-time study was made of this operation and recommendations for shielding were issued. Temporary measures have been taken to reduce exposure until permanent shielding can be installed.

E. Personnel Activities

1. Visits and Visitors

H.C. Money and R.H. Sather visited the National Acme Company for inspection and evaluation of equipment for the production facilities.

T.B. Correy visited Pacific Oerlikon Company and Marine Iron Works at Tacoma, Washington to assist vendors on the fabrication of essential equipment.

S.M. Gill attended meetings of the Metal Quality Working Committee held at Hanford on June 15-17, 1954.

Four members of the Metal Preparation Section attended the Northwest Regional ACS and AECE convention in Richland.

2. Meetings

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

An information meeting concerning slug ruptures was conducted by L.W. Lang of Pile Technology and attended by 56 members of the Section.

Richland, Washington
July 8, 1954

MANUFACTURING DEPARTMENT
REACTOR SECTION
JUNE, 1954

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

The total reactor input plutonium production during June was 136.0 percent of forecast, and 112.7 percent of the May production in spite of the shorter month. Chief reason for the latter was an improved time operated efficiency of 86.6 percent. June production was considerably higher than forecasted as the combined result of the improved operating efficiency, higher than forecasted operating levels, and postponement of a two-week venturi and horizontal rod replacement outage at H Reactor.

The total reactor input production, excluding burnout, reached a new record high, exceeding the previous record high, January, 1954, by 2.7 percent. The time operated efficiency of 86.6 percent, approximately five percent higher than the average for the last half of FY 1954, and the highest since December, 1953, was attained in spite of a record high slug rupture frequency. Use of the "quickie" discharge equipment permitted successful discharge during minimum scram recovery time, of approximately 70 percent of the 28 ruptures.

A. Operating Experience (Continued)

The total reactor output plutonium production in June was 125 percent of forecast, with the discharge of low and higher concentration material, approximately 20 and 260 tons, respectively, being 15.8 and 139.1 percent of forecast, respectively. Low concentration material was significantly below forecast because of changes in the 200 Area requirements for this type of material. The total and higher concentration materials discharged were greater than forecasted because of the accelerated discharge of higher concentration uranium from C Reactor in converting to a program of low concentration production.

The 13 tube J-Q program at H Reactor continued without incident. Initial charging for an additional approximate 400 tube J-Q program has been tentatively scheduled for October, with H Reactor probably receiving the bulk of the material.

Established maximum operating levels, excluding enrichment burnout, were increased a total of 107 megawatts, 42 at C Reactor as a result of raising the tube power limits to 950 KW, and 65 at B Reactor as the combined result of raising the corrosion temperature limit, changes in the flattening pattern resulting from large discharges, and operation under Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits."

A total of 28 slugs failed at all reactors during June, including 22 uranium slugs and six "J" slugs. Rupture distribution by reactor and type is tabulated below:

	B	C	D	DR	F	H	Total
Regular material 4-inch	-	-	-	-	3	-	3
Regular material 8-inch	-	18	-	-	1	-	19
"J" material	-	-	-	6	-	-	6
Totals	0	18	0	6	4	0	28

The total outage time resulting from these ruptures was approximately 160 hours, an unusually low figure considering the large number of ruptures. Removal of the ruptures required approximately 155 hours of this outage time.

A. Operating Experience (Continued)

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	87.8	73.6	96.2	77.8	89.0	95.6	86.6
Reactor Outage Time (Hrs)							
Plutonium Production	88.2	185.1	27.3	51.2	71.4	24.2	447.4
Special Irradiations and Tests	-	5.0	0.2	108.9	8.0	7.3	129.4
Total	88.2	190.1	27.5	160.1	79.4	31.5	576.8
Reactor Unscheduled Outage Time (Hrs.)	32.9	125.4	1.8	35.0	2.2	1.9	199.2
Metal Discharged (Tons)	21.3	134.1	0	14.5	45.4	62.3	278
Water Quality (ppm Iron)							
Raw Water - Average	0.25	0.27	0.23	0.31	0.13	0.29	
Raw Water - Maximum	0.32	0.32	0.28	0.36	0.21	0.38	
Process Water - Average	0.007	0.005	0.006	0.006	0.008	0.007	
Process Water Maximum	0.015	0.015	0.017	0.014	0.025	0.014	
Water Pumped (MM Gals)							
Bldg. 190 to reactor	1942	3127	2010	1611	1802	2209	12701
Bldg. 182 to 200 Areas	-	-	368	-	-	-	368
Bldg. 181	5803		4662		2167	2567	15199
Steam Generated (MM Lbs.)	157		211		129	112	609
Coal Consumed (Tons)	9461		12725		6867	7179	36232

2. Activities

All reactors except C, which continues to be limited by intermediate tube power, operated on corrosion limits until early in June, when, as a result of relaxed corrosion limits, consideration was given to raising power levels to the next limit, the calculated trip-before-boiling limit. Reactor Section evaluation of this limit indicated that it might not be practical under all operating conditions, because of the large number of individual tube limits involved. Consequently, D, DR, H, and F Reactors were authorized to operate on modified trip-before-boiling limits restricted by a 95 C outlet temperature. B Reactor was authorized by Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits," to operate on calculated limits with 100 C as a maximum outlet temperature limit for any tube.

Shipment of irradiated "J" slugs by motor truck from DR Reactor to Arco, Idaho, continued during June, with approximately 2100 slugs shipped in 32 casks. No. Mint material was transferred from Building 105-B to Building 108-B during June since none was available until late in the month when large-scale discharging of J-M tubes was resumed.

2. Activities (Continued)

During June, revision of the "Reactor Section--Power Sub-Section Operating Manual" was completed, and copies of the three volumes were distributed to all Units of the Sub-Section. This manual incorporates operating procedures, detailed equipment descriptions, safety rules, job hazard breakdowns, and security instructions of the Sub-Section into a single volume for more efficient utilization.

The new alum-silicate manufacturing facility at Building 183-D was completed and placed in operation late in the month.

Although raw water quality was normal for this period of the year, and in spite of the many test programs in progress which complicate the water preparation process, filtered water quality was improved and costs were lower than might be expected.

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

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	0	2	0
Production Tests	5	42	3
Total	5	44	3

B. Equipment Experience

During June, 24 reactor scrams occurred. Of these, 16 were caused by normal Panellit system difficulties at B, C, D, DR, and H Reactors. Five scrams at H Reactor were caused by flow difficulties on recirculation tube 0961-H (PT-105-506-E, "Recirculation Studies") as described in the "Improvement Experience"section. DR Reactor was scrammed for 2.2 hours on June 16 by a partially plugged cone screen. One scram at F Reactor occurred when the power level recorder was turned off to change a battery. Investigation of the faulty circuit is planned for the next outage. One scram occurred at D Reactor when a pump supplying filtered water to tube 2171-D (PT-105-525-E, "The Effects of Water Quality on Pile Operation") failed. Total outage time charged to these scrams was 8.1 hours.

An approximate 32 hour process tube leak testing outage occurred at B Reactor on June 20 as the result of abnormally high drier room water collection rates. During the testing of 333 tubes, one major and nine minor nozzle leaks were corrected. After the outage, water collection returned to normal.

During June, horizontal rod work decreased significantly as compared to the previous several months. At B Reactor, No. 6 rod, which was removed from service in May when it became stuck midway into the reactor, was returned to service after removing a one-half inch washer from the gear assembly. Origin of the washer was not determined. No. B rod thimble, found to be leaking in April, was replaced, and the rod returned to service.

B. Equipment Experience (Continued)

At F Reactor, a new thimble for No. A rod was installed, with the replacement of the rod scheduled during the next outage.

A representative of the Houghton Elevator Company inspected the charge elevators at all reactors, and the discharge elevators at all reactors except DR and H Reactors. The remaining elevators will be inspected, and a final report on all elevators is expected in July.

A significant leak developed at the expansion box in the far effluent line at DR Reactor. Repairs are not planned at this time since the expansion boxes are scheduled for replacement as part of Project CG-558 (Reactor Plant Modification for Increased Production). During the interim period, the near line will be used exclusively.

The oil pump gears of Building 190-C process pump motors Nos. 3, 5, and 10 were replaced in June as a result of noisy operation. Similar gears in the other pump motors have required replacement in the past, and the vendor has been contacted regarding improvement of the design of these units.

C. Improvement Experience

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

PT-105-4-MR Suppl. C (Poison Column Control Facility)
The installation of ball valves on 10 additional tubes, total 15, at DR Reactor for discharge of poison columns while operating was completed on June 14.

PT-105-8-MR (Uranium Charging During Reactor Operation)
Two process tubes of uranium were successfully charged-discharged at B Reactor with no difficulty. Charge-discharge was carried out at a power level of approximately 900 megawatts, and at tube powers of approximately 315 and 410 KW. Additional charge-discharge of tubes at progressively higher tube powers is planned on a test basis.

PT-105-506-E (Recirculation Studies)
Attempts to modify the flow and pressure lines and controls for operation of recirculation tube 0961-H continued unsuccessfully and the loop was placed on process water on June 22 after causing five pressure fluctuation scrams totalling 1.2 hours of outage time.

C. Improvement Experience (Continued)

PT-105-517-E Suppl. A and B — (100 Areas Filter Plant Tests) High filtration rates continued with some improvement in the length of filter runs apparently resulting from improved coagulation caused by the use of sulfuric acid and chlorine as coagulant aids.

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

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

PT-105-567-E — (Preliminary Irradiation of J-Q Columns)

All phases of these tests which previously limited H Reactor operation have been superseded by appropriate revision of limits in the Process Standards-Reactor. Mining of one central tube channel is the only work remaining on PT-105-530-E. Irradiation of J-Q columns proceeded satisfactorily as reported previously in "Operating Experience."

PT-105-562-A — (Slug Evaluation at Increased Levels for Tritium Production)

Irradiation of the 48 remaining columns at C Reactor continued without incident. No columns were discharged in June.

Nine revised Process Standards-Reactor were approved and issued during June. These were standard titled "Process Tube Water Temperature Rise Limits - Trip-Before-Boiling," "Emergency Water Supply," "Horizontal Rod System," "Power Level Monitoring--Beckmans," "Rate of Power Decrease," "Rate of Control Rod Withdrawal and Rate of Power Rise," "Dual Reactor Neutron Monitor Inter-Tie," "Handling of Irradiated Enriched Slugs," and "Handling of Unirradiated Enriched Slugs." The most significant changes involved decreasing the increment between the Beckman reading and the specified Beckman trip setting to reduce the possibility of boiling in the process tubes in the event of inadvertent reactor power increases as necessitated by the increased allowable process tube outlet water temperatures recently authorized, and increasing the temporary trip before boiling limits for DR Reactor to the same value as specified for B, D, F, and H Reactors.

The report of invention indicated below was submitted during June:

Inventor	Invention
Ralph E. Rugg	Improvement on Extensible Area Specimen Holder for R.C.A. Electron Microscope, Model EMU

D. Events Influencing Cost

The relatively small amount of ruptured slug removal work, a decreased amount of horizontal rod work, a minor amount of process tube leak testing, and the absence of other major scheduled or unscheduled maintenance work favorably affected charges for reactor maintenance.

Power Sub-Section costs increased approximately $25,000 or 6.1 percent in June as compared to May principally because of increased waterflow, increased coal consumption, and addition of sulfuric acid feed at Building 183-D. Filter plant chemical costs increased approximately $12,000 or 20 percent and coal costs increased approximately $13,000 or four percent.

Reactor Section charges to the expansion program for June continued to increase as compared to previous months as the result of further additions of personnel for training prior to the staffing of the K Reactors.

Tentative estimates indicate that both the plutonium irradiation unit cost and the total irradiation unit cost will be approximately 10 percent lower in June than in May, primarily because of the greater production, but also because of the significant decrease in reactor maintenance charges as noted above.

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 June 17, 1954.

CA-431 (100-C Plant)
Delivery of the one-inch outside diameter aluminum tubing connectors for C Reactor will be delayed until mid-August. The installation of vent piping for relief of excessive contaminated vapor in the cushion chamber at Building 105-B was completed as described under "Radiation Experience."

CA-512 (100-K Facilities)
Design of the K Reactors and Water Plants is 99.2 and 99.8 percent complete, respectively. Construction completion percentages are:

Overall	83
KW Reactor	87
KE Reactor	72
KW Water Plant	94
KE Water Plant	78
General Facilities	85

Radiographic inspection of Building 190-KW secondary pump casings continued to show serious defects

1. Project Status (Continued)

throughout the casings. Vendor efforts to repair the casings have been unsuccessful, A pump casing of new design has been received but has not been tested. At AEC request, the General Electric Company has reviewed the problem and concluded that limited operation with the defective casings will be possible for six months.

CG-558 (Reactor Plant Modification for Increased Production) Scope design is estimated to be 67.5 percent complete. The General Electric Company received an AEC directive authorizing spending, with certain exceptions as to area, $26,800,000. The exceptions state that all necessary design work should be performed for full modifications at 100-F and H water plants, but that no procurement, construction, or installation funds should be expended on these water plants at this time.

RDS-D-10) Reactor and Water Plant Design Development)
RDS-D-11) Two reports, HW-31467, "An Engineering Study of Power Recovery Systems for Dual Purpose Reactor Plants," and HW-31463, "An Economic Evaluation of Factors Influencing A Choice of Dual Purpose Reactor Coolant Temperatures," were issued by the Engineering Department. A preliminary study has been initiated by the Engineering Department to determine the degree of hazard involved in the complete failure of the steam supply for the turbine-driven process pumps in B, D, DR, F, and H Water Plants during reactor operation at full power. Another study was continued to determine what can be done to prepare existing reactors for a loss of all process cooling water. Additional details on these two studies are contained in HW-32095.

2. Plant Engineering

A number of engineering and development studies were active in the Section during June. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in documents HW-32274 and HW-32297. Several items of interest are reported below.

Photographing of fire and firebed conditions continued using a movie camera capable of from one thousand to three thousand frames per second. Pictures taken show particles of coal floating in the

SECRET

2. Plant Engineering (Continued)

furnace atmosphere. By introducing incombustible particles of known size, an effort to determine coal particle size will be made.

The study of noise levels in Power Sub-Section Buildings continued. A Sound Level Meter, Octave-Band Noise Analyzer, Vibration Pick-up and Control Box have been ordered to facilitate the study. The Ultracoustic sound insulating material for fabrication of a portable partial motor enclosure is expected to arrive in July.

Measurements and correspondence with the manufacturer have confirmed the fact that larger impellers can be installed in the existing Building 190 secondary pump casings. This installation would provide considerable steam savings, but would also probably raise the noise level. A trial installation is being considered.

The possibility of using nitrogen in the reactor atmosphere, in addition to carbondioxide and helium, for supplementary control purposes is being studied. At present, no quantitative data are available on the corrosive effect of nitrogen in the atmosphere. Such information is being determined by Pile Technology Sub-Section personnel, and when available will be used for further investigation of nitrogen as an auxiliary control.

Twelve uranium slugs, with an average exposure of 564 megawatt days per ton, were chosen at random and decanned to permit examination of the uranium for possible surface imperfections as an aid in investigating the problem of slug ruptures.

F. Significant Reports

1. Routine

Monthly operating reports issued for May were:

HW-31964-A	Reactor Section	JH Warren	6- 7-54
HW-32117	Operations Sub-Section	RO Mehann	6- 1-54
HW-32028	Process Sub-Section	OC Schroeder	6- 1-54
HW-31998	Plant Engineering Sub-Section	FAR Stainken	6- 1-54
HW-32027	Radiation Monitoring Sub-Section	PC Jerman	6- 3-54
	Maintenance Sub-Section	EE Weyerts	6- 4-54
	Power Sub-Section	JC McLaughlin	6- 3-54

Other routine reports issued during June included:

HW-32206	"Monthly Progress Report, Reactor Section Expansion, June, 1954	HT Wells	6-25-54
	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	FAR Stainken	6-17-54
HW-32006	"Reactivity Balance and Associated data - Period April and May, 1954"	AP Vinther	6- 1-54

F. Significant Reports (Continued)

2. Non-Routine

HW-31829	"Unit Motion Report, Biological Shield Displacement"	RR Bloomstrand	6-15-54
HW-31945	"Recommended 'C' Metal Exposure"	GF Owsley	5-24-54
HW-32051	"Process Test MR-105-21, Allowing B Reactor Operation on Trip Before Boiling Limits"	(DL Moore (KW Hess	6-2 -54
HW-32067	"Process Test MR-105-22, Installation of Orifices on Rear Crossheaders"	AK Hardin	6-15-54
HW-32076	"Hanford Water Analysis"	CW Botsford	6- 9-54
HW-32088	"Interim Report, Production Test 105-4-MR, Supplement B, Evaluation of Poison Column Control Facility"	JE Robb	6-16-54
HW-32094	"Production Test 105-8-MR, Uranium Charging During Reactor Operation"	JE Robb	6-28-54
HW-32102	"Final Report--Process Test MR-105-12, Operation of H Reactor with Maximum Protection from Panellit System"	PC Walkup	6-18-54
HW-32256	"Process Water Pressure Decay Tests-100-B and 100-F Areas"	RL Turner	6-30-54
--	"Results of Inspection of Elevators by Manufacturer--Minutes of Meeting"	TH Lyons	6-23-54
--	"Study of the Methods for Handling Respiratory Protective Equipment"	JS Corbett	6-15-54
--	"Reactor Section--Power Sub-Section Operating Manual" (3 volumes)	--	Apr. 54
--	"Reactor Section Maintenance Work, Revised Cost Coding System"	--	6-24-54

III. PERSONNEL

A. Organization

Effective June 1, P. R. McMurray was appointed superintendent of the F Reactor Operations Unit, replacing D. S. Lewis who was assigned to the KW Reactor.

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	3	0
Operations	309	324	/15
Maintenance	517	518	/ 1
Plant Engineering	31	31	0
Power	433	441	/ 8
Process	42	42	0
Radiation Monitoring	67	73	/ 6
Section Total	1402	1431	/30

B. Force Summary (Continued)

Changes during June included 31 transfers into the Section, seven transfers out of the Section, 13 new hires, four terminations, two reactivations, and five deactivations. The Operations, Power, and Radiation Monitoring Sub-Sections' increases are to provide manpower for the operation of the K Reactors.

C. Safety Experience

During June, there were no Major Injuries in the Reactor Section. The potential Major Injury which occurred on May 24 at Building 181-D, and involved a possible hernia incurrence by an electrician while moving a barrel of oil, was classified as non-tabulatable as a result of a joint decision by the Medical and Safety groups.

One Sub-Major Injury, No. 261, and one Near Serious Accident occurred in the Reactor Section in June. In addition, a Sub-Major Injury, No. 260, which occurred in May but was not covered in last month's report, is reported.

Sub-Major Injury No. 260 involved a pipefitter who fractured a finger at Building 183-C on May 26 when a tank car manhole cover tipped and caught his finger between the cover and the edge of the manhole. Sub-Major Injury No. 261 involved an instrument technician who suffered an impact fracture of the left shoulder when he slipped and fell June 26 on a wet sidewalk by the Building 105-H Badge House while running to the bus during a rain storm.

Near Serious Accident No. 54-16 occurred on June 27 at Building 105-DR when an electrician sustained a bruised left arm when it was caught between a rear face light fixture and the discharge elevator guard rail as the elevator was raised.

Approximately 135 Power Sub-Section employees were fitted with ear plugs during June by industrial physicians as recommended by the Medical Department.

D. Radiation Experience

One Class I Radiation Incident, No. 367, occurred at Building 105-C on June 19 when an Operations Sub-Section operator received radiation exposure in excess of that planned while reclaiming dummies on the wash pad as a result of the failure of a survey instrument to indicate the correct radiation dosage rate.

At B Reactor, the installation of a 30-inch vent line connecting the Building 105-B effluent water cushion chamber, the No. 1 junction box, and the west Building 105-C effluent water line was completed and placed in successful operation on June 22. As a result, the Building 105-B cushion chamber corridor was released from radiation zone status for the first time in approximately 18 months.

D. Radiation Experience (Continued)

A hole was drilled through the jacket of a "J" slug at DR Reactor immediately after the slug was discharged to determine if the radioactive gas common to ruptured "J" slugs is present in undamaged slugs. As soon as the jacket was penetrated, gas was evolved, and an airborne radiation condition identical to that accompanying ruptured "J" slugs resulted. Samples of the gas were obtained for analysis, but results are not as yet available.

E. Personnel Activities

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

Principal items of interest during June in regard to employee communications were five additional meetings in the current series of information meetings conducted by Reactor Section staff members, R. O. Mehann and J. C. McLaughlin, for non-exempt employees. Two meetings of key personnel of the Maintenance Sub-Section were held to outline the new Sub-Section organization to become effective July 1, and to discuss the detailed duties of individuals concerned.

J. H. Warren, Reactor Section Manager, is visiting Savannah River Works and West Milton, and attending a General Electric Company management conference at Association Island during the period June 28 to July 2.

E. J. Filip of the Operations Sub-Section, and E. H. Kolts of the Plant Engineering Sub-Section, visited the Pacific Oerlikon Company plant at Tacoma, Washington, on June 22 to 24 to inspect and witness prototype tests of the new K Area slug charging machine.

C. W. Botsford of the Process Sub-Section and S. L. Nelson of the Operations Sub-Section attended the A.I.Ch.E. Conference on Nuclear Engineering at the University of Michigan, Ann Arbor, June 21 to 25.

R. D. Schilling of the Process Sub-Section visited the plants of the Hydromotor Division, Bonnot Company at Canton, Ohio, and the Rockwood Sprinkler Company at Worcester, Massachusetts to discuss the development of nozzle assemblies for charge-discharge during operation. He also visited the General Engineering Laboratory at Schenectady.

M. H. VanHorn of Byron Jackson Company and T. D. Martin of Worthington Manufacturing Company visited 100-C Area on June 18 to discuss operating problems with Power and Maintenance Sub-Sections supervision.

[redacted]

Richland, Washington
July 8, 1954

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
JUNE, 1954

I RESPONSIBILITY

The Separations Section assumed landlord responsibility from the AEC for the 2101 Building in 200 East Area on June 1.

II ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	June		May	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	60	1	54	0
Charges completed in Conc. Bldgs.	62	0	54	1
Special charges - Conc. Bldgs.		4		9
Charges completed-Isolation Bldg.	122	0	298	1
Average Waste Losses, %		2.3		2.3
Special charges - Isolation Bldg.		8		32

[redacted]

a. Bismuth Phosphate Operations (Continued)

	June		May	
	Normal	Acid Wash	Normal	Acid Wash
Material balance, %	96.2		98.5	
Yield through Process, %	93.9		96.2	
Average cooling time (days)	99		88	
Minimum cooling time (days)	82		69	

b. Redox Operations

	June	May
Equivalent charges started	41.7	256
Charges completed	47.7	256
Tons Uranium delivered to storage	41.7	175.5
Average Production Rate per operating day, Tons	6.5	6.23
Average Daily Operating Rate for the month, Tons	1.4	5.66
Average yield, %		
Uranium	96.8	98.3
Plutonium	98.8	100.6
Total Waste Loss, %		
Uranium	1.7	90
Plutonium	2.15	66
Average cooling time, days	80	82
Minimum cooling time, days	74	70
Percent down time	78.7	9.2

c. 234-5 Operations

	June	May
Batches completed through Task II	34	228
Runs completed through Task III	34	139
Reduction yield, RM	98.7	97.4
Waste Disposal, units	0.39	5.1

d. UO_3 Operations

	June	May	To Date
Uranium drummed, Tons	359	475	6598
Uranium shipped, Tons	411	456	6572
Average cooling time, days (Redox)	105	93	
Minimum cooling time, days (Redox)	95	89	
Waste loss, %	0.07	0.23	

e. TBP Operations

	June	May	To Date
Tons received from Metal Removal	203	350	3978
Tons shipped to UO_3 Plant	202	340	3832
Average Production Rate per operating day, Tons	8.49	11.70	
Average Daily Operating Rate for the month, Tons	6.73	10.96	
Average yield, %	97.62	99.04	
Total Waste Loss, %	1.40	0.81	
Ratio Waste Volume returned to Volume removed	1.21	0.99	
Percent Down Time	20.70	6.29	

f. Mint Operations

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

g. Power

	200 East	200 West
Raw water pumped, gpm	1 281	7 084
Filtered water pumped, gpm	427	1 005
Steam generated, lbs/hr	34 594	161 310
Maximum steam generated, lbs/hr	50 000	224 000
Total steam generated, M lbs.	24 908	116 143
Coal consumed, tons (est.)	1 520	6 996

h. Waste Storage

	Equivalent Tons U	
	June	May
Metal Waste reserve storage capacity-T Plant	929	1005
1st Cycle reserve storage capacity-T Plant	156	45
Metal Waste reserve storage capacity-B Plant	145	145
1st Cycle reserve storage capacity-B Plant	4	4
Redox Waste reserve storage capacity	1509	1532

2. Activities

a. Redox Processing

Operations were suspended until June 3 following failure of the first cycle feed pump on June 1. A feed rate of 7 tons per day was initiated soon after start-up on June 3, and operations continued until June 6 when a plugged salt waste line dictated another shut down. Following removal of the line obstruction by means of hot chemical flushing, processing was continued until June 9, when metal solution feed was depleted. Vessel and column flushings in preparation for the Phase II changes in operating equipment were immediately instituted. Essentially all of the major equipment changes associated with the Phase II program were completed by month-end. All silo work was completed by June 26 (1-A, 1-S, 1-C, 1-O, 2-D, 3-D columns and associated jumpers changed); however, canyon cell changes were handicapped by operating difficulties experienced with the 60 ton canyon crane. Major equipment changes in Cells F, G, and J were completed, as were Cell H vessel replacements. Work remaining consists essentially of jumper installation in H Cell.

The initial attempt to flush contaminated particulate material from the 291-S stack was halted on June 30 when the exhaust fan shut down permitted highly contaminated canyon air to escape to other parts of the 202-S building via the air supply duct work. A second attempt to flush the stack is scheduled for July 2 following corrective action taken to halt air reversals.

b. TBP Processing

Line performance was generally satisfactory in the TBP Plant; however, in mid June there was experienced a significant increase in the concentration of DBP contaminant in the final uranium product. Extensive organic vessel flushings and organic washes appear to have resolved the difficulties. Production rates averaged 3.5 and 3.8 tons per day for "A" and "B" Lines, respectively.

c. UO_3 Processing

In the UO_3 Plant, mild foaming was experienced in the calcination furnaces during most of the month. DBP contamination of the feed stream (RCU) from the TBP Plant caused the foaming. By the end of the month, better quality feed was being received and foaming had subsided.

d. Waste Metal Removal and Waste Disposal Processing

Waste metal removal rates were satisfactory with no major processing or mechanical difficulties being experienced. Removal activities were completed in the present program in U Farm and most of the sluicing equipment has been transferred to the TX Tank Farm.

d. Waste Metal Removal and Waste Disposal Processing (Continued)

The original program of discarding 105,000 gallons of first cycle waste supernate from the 106-T Tank to the open ditches was completed in the 200 West Area. The equipment used for this work was removed to the 109-TX tank and 123,000 gallons of first cycle waste from this tank were discarded to an open trench.

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 (90 tons) during the month was a new record for a bismuth phosphate plant.

f. Isolation and Metal Fabrication Processing

Normal production operations in the Isolation Building were limited to the first week of the month, at which time the production load was greatly reduced due to shut down of the Redox facility. Approximately 30 runs were held up in order to permit completion of required equipment improvement in Cells 2 and 3. The low level material from the Bismuth Phosphate plant was processed routinely throughout the month in Cell 4, and all off-site shipping commitments for the month of June were met.

In the Metal Fabrication Building, production of buttons was 100% of the commitment, and production of final shapes was 160% of the commitment. The rehydrofluorination rate in Task II increased to approximately 20 percent and was attributed to the large number (26) of double batch filter boats processed which makes for fewer total runs processed.

g. Mint Processing

There was no production during June for the Mint Extraction Unit due to feed material not being available. The DR-10 material discharged in June will be available for extraction on July 6.

3. Special Operations

a. Waste Evaporators

June 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	499 045	314 188	184 857	37.0
242-T	376 750	255 750	121 000	32.1

b. Pu Recovery, 234-5

The equivalent of 1.0 bottle of product was processed in Metal Recovery (Hood 40), and the equivalent of 2.0 bottles of material was transferred to the Isolation Building for reprocessing.

c. UO_3 Powder Recovery - UO_3

Approximately 1462 lbs. of uranium were recovered when 47 filter bags were cleaned using an industrial type vacuum cleaner. This material was blended into the process stream via the bulk handling system.

B. Equipment Experience

1. Operating Continuity

Redox down time totalled 567 hours. Phase II equipment changes accounted for 515 hours, while the remaining 52 hours were charged to a first cycle feed pump failure and a plug in the salt waste line.

Total down time for the TBP Plant was 151 hours for A Line and 147 hours for B Line. The outages were due to the need for column and vessel flushes, and the raw water shutdown for tieing in the new export line from the 100 Areas.

2. Inspection, Maintenance, and Replacement

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

Failure of the H-4 pot coil progressed to the point where hot oxidation was impossible after June 1. The vessel was removed on June 28 and a replacement will be installed during the present shut down period.

b. Phase II Changes - Redox Silo

The following silo changes were carried out during the June shut down:

1) The Phase II 1A, 1S, 1C, 1O, 2D, 3D columns and attendant jumpers were installed.

2) Cold side instrumentation revisions were approximately 90% complete at month end.

c. Phase II Changes - Redox Canyon

The following canyon work was carried out during the June shut down:

c. Phase II Changes - Redox Canyon (Continued)

1) G Cell

a) Installed Phase II G-3 organic still

b) Installed Phase II G-2 condensor

2) F Cell

a) Installed Phase II F-2 concentrator

b) Installed Phase II F-3 condensor

3) H Cell

Started installation of Phase II H-4 oxidizer

4) J Cell

a) Installed J-2 scrubber

b) Installed J-3 filter. This filter will replace the J-1 filter. Off-gas from the J-3 filter will be diverted through the sand filter.

c) Installed J-5 filter. Off-gas from this filter is now diverted through the sand filter.

d. First Cycle Feed Pump - Redox

The first cycle feed pump, which had previously been reported as showing signs of wear, failed on June 1, 1954. A new pump was installed on June 3, 1954 and performed satisfactorily after water seal difficulties were corrected.

e. 60 Ton Crane - Redox

On June 8, 1954 the operator of the 60 ton crane, in returning to the crane maintenance platform, travelled through an inoperative limit switch which failed to denote that the right hand auxiliary unit was not racked in far enough to permit passage by the parapet wall. The auxiliary unit hit the parapet wall, and the impact sheared off the trolley and supporting I-beam. Maintenance removed a similar I-beam and attendant equipment from the canyon crane at the 221-B Building as a replacement and returned the crane to Operations on June 13.

f. Calcination Furnace #19 - UO_3

Calcination furnace #19 (gas fired Luckey Pot) was taken out of service when it was noted that the agitator raised about

f. Calcination Furnace #19 - UO_3 (Continued)

one inch during normal operations. It was necessary to dismantle most of the drive mechanism in order to reposition the agitator. Late in the month a leak developed in the kettle which permitted UNH to enter the fire box. The cause of this failure had not been determined at month end and the unit remains out of service.

C. Improvement Experience

1. Process Tests and Revisions

a. Continuous Coating Cycle - 234-5

Eleven plutonium pieces were coated by the circulating coating gas process and ten pieces passed coating specifications. The over-all coating quality continues to be excellent and "whiskers" formation is almost non-existant. The average coating time cycle for the continuous coating of a Model 110 piece is three hours compared to the seven hours required for the standard intermittent coating procedure.

b. Organic Recovery - TBP

Approximately 2700 gallons of organic had accumulated in the A Line RAF tank from RCU and cell drainage rework material. This organic was successfully recovered in about five hours by shutting off the aqueous RAF to the tank and processing the organic through the column, with reduced RAX and increased RAIS flows. The RCW produced had high gamma activity and increased disengaging time but was shown, in the laboratory, to be recoverable by sodium carbonate washing.

c. Recycle Processing - Redox

Following complete failure of the H-4 oxidizer pot coil on June 1, recycle from 231 Building was diverted to the E-7 tank via E-22 Recycle Tank and the E-7 sampler. In order to minimize the amount of aluminum nitrate required for recycle processing, the unloading jet was converted from water to steam operation. High acidity resulting from recycle addition, in spite of a 45% reduction in the amount of acid added to the 1BP in E-6 and use of acid-deficient ANN for butting, required adjustment of the 2A and 3A column flows to give an aqueous to organic ratio in the extraction sections of 1.5. Following the depletion of plutonium cycle inventories on June 10, the plutonium cycles were operated at a 10 tons per day equivalent rate on recycle to provide a supply of empty product transfer cans for the July start-up. It was necessary to adjust the acidity of the recycle during this period by the addition of 25% caustic to the E-22 Recycle Tank to permit satisfactory plutonium recovery in the extraction system.

2. Inventions or Discoveries

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

D. Events Influencing Costs

Separations Section expenditures for June are expected to reflect a sharp decrease from the May level of expenditures. This decrease in costs will be primarily due to the reduced essential material requirements associated with the reduction in June production for the TBP and Redox Plants.

Total force of the Separations Section decreased by sixteen due to transfers or terminations.

E. Plant Development and Expansion

1. Project Status

a. Project CA-513-A, Purex

Purex design is 99.8 percent complete compared with a scheduled 100 percent. The project cost and construction completion schedule for CA-513-A have been revised by the AEC as follows:

Present working estimate	$73,281,000
Original working estimate	69,420,000
Construction completion date	2-1-55
Original construction completion date	1-1-55

Construction as of June 15 is 44.1 percent compared with a 45.4 percent scheduled completion. The "Ready for Operation" date estimated by the Contact Engineer group remains at August 1, 1955.

Several Lump Sum Contractors were temporarily evacuated from portions of 200 East Area when radioactive particles were detected in their work areas on June 7, 1954. The decision by AEC to interrupt construction activities until decontamination could be accomplished was based on a recommendation by Radiological Sciences Department. Source of contamination was determined to be the Redox stack.

b. Project CG-496, Recuplex Installation

Construction efforts accelerated during the month after the receipt of vessels and valves. Revised construction forecasts indicate a ready for use date in January, 1955. Cisco Construction Company resumed construction of the Underground Waste Storage Facilities which had been halted by AEC due to labor difficulties.

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

Stage I: The Stage I portion of this project was essentially complete at month end.

Stage II: Construction of 233-S concentration building is falling behind schedule slightly due to procurement difficulties. The new ready-for-operation date is now estimated to be approximately January 1, 1955. Erection of the 211 (ANN storage) and the 204 (Uranium storage) tanks is in progress.

Facilities for decontamination of final Redox UNH streams by silica gel are being designed. Initial comment prints have been reviewed and returned to the Engineering Department.

d. Project CG-551, 234-5 Building Expansion

Fabrication and mock-up of Task III equipment in the 272-S shops continued on schedule. Installation of the furnace retort in Task II and modification of the balance was completed. Minor Construction has scheduled start of construction on the Final Inspection Facilities for July, 1954.

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

1) Sample Gallery Ventilation Improvements: Riser hold-down clamp and flusher mechanisms are being fabricated by Minor Construction. Installation work will be resumed upon receipt of material from Minor Construction.

2) Backcycle of Waste Streams as Scrub Solution: Design of the 2DW and 2AW backcycle facility (D-14 concentrator plus jumpers) is underway. Installation of the 3DW backcycle system was essentially complete at month end.

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

Rough checks indicate the actual percolation rate in the basin is approximately one-fourth of the design rate. Further testing and study are being done to determine why the percolation rate is low. Revision 9 of the project proposal requesting an additional one acre basin of similar design with appropriate control, testing, and measuring devices should be ready for approvals early in July. The new basin is scheduled to be complete by September 1, 1954. Work has started on the process sewer weir box located just east of PMH #3 but due to other urgent work it may not be completed in time to make tie-ins during the present Redox shut down.

The old swamp and 202-S retention basin are backfilled and the only work remaining on the original project is placing posts and radiation signs around the backfilled areas.

g. Project CG-562, TBP Modifications

Revision No. 5 to the project, which proposes a change in the physical completion date of the project from May 15, 1954 to April 1, 1955 is being held in abeyance by the AEC until the need for additional solvent treatment facilities is firmly established.

The Engineering Department has been requested to prepare a further revision to the project to include those additional facilities required to permit two-cycle operation of the 221-U Building.

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

All of the Stage I equipment was installed during the month.

Design of Stage II jumpers has been delayed due to more urgent work on Project CG-535, Redox Expansion - Phase II.

2. Manufacturing Engineering

a. Standards Program

The direct material standards for T Plant and 231 Building were revised to conform with the requirements of the present processes.

Work has begun on a revision of the 234-5 Building operations Direct Labor Standard and on development of more precise heating and air conditioning standards.

b. Work Simplification and Cost Reduction

A condensed version of the Work Simplification Round Table Program was presented to the Manufacturing Department staff on June 24.

Cost reduction studies were initiated in the 234-5 Analytical Laboratory and in the 222-S Laboratory. It is planned to study analytical procedures, laboratory layout, clerical methods, and other items which contribute to cost. The first Work Simplification committee meeting of a series planned was held with Process Analytical personnel to discuss specific cost reduction proposals.

c. Engineering Assistance

A study to develop means of reducing radiation and contamination hazards in the 222-S decontamination room was completed. It was recommended that a remotely operated facility for "doorstop" sample carrier decontamination be installed at a cost of $6,000.

c. Engineering Assistance (Continued)

It was also recommended that the procedure and equipment for disassembling and decontaminating the bayonet assembly be modified to reduce contamination potential and increase efficiency. Equipment and hood modification costs are estimated at $550.

A study was initiated to determine if a facility for decontaminating mobile equipment is justified. The economics of the problem are being reviewed, and preliminary scoping of a proposed facility is being made.

The "as-built" drafting program was continued with the efforts of the draftsmen being directed toward making up new 221-U cell diagrams. Eighty percent of the parallel operation data have now been recorded. Upon completion of these drawings, the proposed series operation data will be immediately superimposed on the same drawings, using a different color.

d. Property Management

The preventive maintenance painting program was continued with efforts being centered on the 200 East Area. Three frame buildings and numerous barricades were re-painted during the month, which considerably improved the general appearance of the area. One frame building in the 200-W Area was re-painted during the month.

The Section officially accepted Landlord responsibility for the 2101 Building, 200 East Area on June 1. Cost codes were established for Cost Accounting and plans and policies were formulated for operating the building from a Landlord standpoint. Space was allocated to the Plant Auxiliary Operations Department for a permanent file storage center and for stand-by warehousing.

F. Significant Reports Issued

1. Routine

Number	Title	Author
HW-32313	Separations Section-Operations Sub-Section Monthly Report	V.R. Chapman
HW-32312	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-32296	Separations Section-Process Sub-Section Monthly Report	W.N. Mobley
HW-32299	Separations Section-Radiation Monitoring Sub-Section Monthly Report	A.R. Keene

1. Routine (Continued)

Number	Title	Author
Official Use Only	Separations Section-Power & Maintenance Sub-Section Monthly Report	R.T. Jessen
HW-32230	Separations Section-Mint Extraction Unit Monthly Report	O.V. Smiset
HW-32200	Monthly Progress Report, Plant Expansion Plant Engineering Sub-Section, Separations Section, June 1954	F.A. Hollenbach
HW-32305	Separations Section-Essential Materials	J.P. McBride
HW-32083	Separations Process Council Meeting	O.F. Beaulieu

2. Non-Routine

HW-31522	Surface Dosage Rate of Task III Feed Material	G.L. Helgeson
HW-32084	Radiation Incident, Class I, No. 364	D.R. Koberg
HW-32140	Radiation Incident, Class I, No. 366	W.G. Westover
HW-32217	Radiation Incident, Class I, No. 368	J.P. Corley
HW-32253	Radiation Incident, Class I, No. 369	J.P. Corley
HW-32233	Radiation Incident, Class I, No. 370	D.R. Koberg
HW-32173	An Analysis of Redox Sand Filter Data	D.R. Koberg
HW-32187	A Study of Pot Room Exposure Rates	G.L. Helgeson
HW-31989	215 MWD/Ton Batch Size Limits and Control in the Bismuth Phosphate Plant	W.G. Browne by H.W. Murray
HW-31898	Production Test 221-T-17, Increased UNH Concentration in Bismuth Phosphate Plant	H.W. Murray
None	Standard Analytical Requirements, UO_3 Plant, P.E. Report No. 120	R.H. Silletto
None	Standard Analytical Requirements, Tank Farms and Waste Evaporators, P.E. Report No. 121	R.H. Silletto
None	Breathing Air Supply Trailer P.E. Report No. 123	M. Pociluyko
None	Sampling Equipment Decontamination in the 222-S Laboratory, P.E. Report No. 42	V.P. Madsen
None	Scope Design for Organic Filter, TBP Plant, P.E. Report No. 122	H.F. Tew
None	Utilization of 224-U Building, Nitric Acid in Redox Plant, P.E. Report No. 124	K.R. Ridgway
None	Relation of Separations Plant Equipment Experience to the Purex Design, P.E. Report No. 48	F.A. Hollenbach

III PERSONNEL

A. Organization

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

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	5	5	0
Operations Sub-Section	611	605	-6
Power & Maintenance Sub-Section	592	590	-2
Process Sub-Section	201	195	-6
Radiation Monitoring Sub-Section	76	76	0
Plant Engineering Sub-Section	27	25	-2
Mint Extraction Unit	39	39	0
Section Total	1551	1535	-16

C. Safety Experience

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

D. Radiation Experience

Five Class I radiation incidents occurred during the month. One (#366, HW-32140) involved pressurization of Cell 2 process tanks in the 231 Building and subsequent release of process vapors to the cell atmosphere, with attendant internal exposure hazard to several employees. At 202-S, a process blowback in the H-4-C chemical addition line caused a short-lived radiation problem in the south pipe gallery (#364, HW-32084). A severe air reversal in the Redox canyon caused by unfavorable winds and an open tunnel door resulted in air conditions up to 10^{-7} uc fp/cc through the south pipe gallery, SWP lobby, and adjacent work areas (#370, HW-32233). Failure to properly use a monitoring instrument resulted in a potential overexposure at 224-U (#368, HW-32217). Release of heavy equipment from the 241-S Diversion Box area without an adequate survey resulted in an uncontrolled exposure to a rigger estimated to be 230 mrads (#369, HW-32253).

The Redox Phase II equipment replacement proceeded with generally good radiation control. Removal and burial of canyon cell equipment proceeded with only one known case of contamination spread outside radiation zones. Severe canyon crane contamination occurred toward the end of the month, however, during H and J cell work.

The Phase II work was affected on June 30 by high air contamination levels during the 291-S fan shutdown for stack flushing. Highly contaminated canyon air escaped to other parts of the 202-S Building via the air supply duct work and resulted in personnel evacuation until air conditions returned to normal.

For the approximately ten days of Redox operation and a full month of T Plant operation, stack emission appeared well-controlled by the indices

D. Radiation Experience (Continued)

of total emission, a maximum radioruthenium emission of 1.4 curies per 24 hours and a maximum radioiodine emission of 1.3 curies per 24 hours being measured. At the end of the month, however, a particulate emission occurred in Redox during exhaust fan startup after the initial attempts to flush the 291-S stack.

E. Personnel Activities

1. G.E. Selection Program for Supervisors

Evaluation was completed for seven Power and Maintenance personnel during the month.

2. Conference Leading Training

Six Separations Section personnel completed the one day training on June 21.

3. Process Training

Two exempt and ten non-exempt Operations personnel completed process training during the month. Preparations were completed for the special Purex "process sampling" school to start July 2.

4. Visitations

C. P. Cabell visited Schenectady from June 28 to July 4 for conferences on Manufacturing Engineering and other business.

ENGINEERING DEPARTMENT

JUNE 1954

TECHNICAL SECTION

Preparation of hot press canned solid uranium slugs for pile irradiation test has commenced. The canning will be completed about the middle of the month and the slugs should be charged by August 1. Successful elimination of the can blister problem when hot press canning in air has been achieved with improved component matching and improved technique in the sizing operation. In a recent 100 slug test, only three slugs were rejected for blisters.

Fourteen hollow slugs for internally and externally cooled operation have been hot press canned. Further development work on this type of slug is continuing. A test quantity should be prepared for pile charging about the end of August.

Encouraging results were obtained by Bridgeport Brass Company at Adrian, Michigan, in the alpha phase extrusion of uranium into hollow rod sections of both $\frac{1}{2}$ and $\frac{1}{4}$" internal diameter. The hole was slightly elliptical and eccentric, indicating need for additional tool development before production of hollow rods with a $\frac{1}{4}$" internal diameter can be accomplished. Additional tests will be performed the second week of August.

Canned slugs which have been anodized by a new improved procedure have now resisted attack of pile water at 120 C for over six weeks. The surface films are still very hard and virtually unattacked. A test quantity of anodized canned slugs has been prepared and will be charged to the piles during the month.

During June, all piles except C were limited by trip-before-boiling considerations and were held to 95 C outlet temperature, with the exception of B which operated at 100 C maximum under Production Test conditions. C Pile was limited to 950 KW/tube maximum. The effective number of tubes was severely reduced because of loss of reactivity as a result of decreasing concentration from 625 to 200 MWD/T.

Twenty-one failures of normal uranium slugs occurred during the month, eighteen at C Pile and three at F Pile. Thirteen of the failures at C Pile consisted of metal charged under Production Test 313-105-25M. The rupture rate of this metal continues three to five times that of eight-inch triple-dip canned metal at all areas where a comparison is possible.

Simulated in-pile boiling studies in the process tube mock-up were extended to 500 psi static pressure with encouraging results. Steps are under way to prepare for the in-pile boiling experiment in the H recirculation loop.

During the short period of Redox plant operation before the scheduled shutdown for installation of new Phase II equipment, failure of the H-4 oxidizer coil necessitated operating with a dichromate head-end procedure instead of

a permanganate-head-end procedure. As anticipated, this process change resulted in 15 of 26 uranium product batches with gamma ratios greater than 3.0 and rework of a substantial portion of the plutonium product. During this period the plutonium recycle from Z plant was successfully recycled to the Cross-Over oxidizer instead of the Head-End oxidizer. Phase II installations in the silo, G-cell, F-cell, and J-cell were nearly completed, and changes in H-cell were underway at month end.

In the waste metal recovery plant, continued use of the continuous sluicing-intermittent blending technique for uranium removal from the tank farms has permitted high sustained removal rates, with the first major removal rate reduction indicating the tank to be essentially empty. This may eliminate the production curtailments expected during cleanout operations. A contaminant in the solvent of unknown source and composition has resulted in intermittent high uranium losses in the RA and RC columns and in production curtailment in the conversion facility due to pot foaming. General solvent quality has decreased during this period with increased distribution coefficients for dilute uranium, increased residual uranium content, and apparent higher extraction for nitric acid. Various changes in operating practices have been incorporated to minimize the effect of this problem and laboratory efforts are targeted at identification of the interferences and development of a satisfactory solvent cleanup process. Aside from the pot foaming, calcination operations were normal except for the development of a leak in one of the Luckey gas-fired pots. Continued studies on the preparation of high reactivity powder by the addition of sulfamic acid suggests that reduction of the agitator speed will eliminate the caking problem experienced.

Laboratory scale dissolving studies have developed means of reducing the dangerous evolved hydrogen concentrations in the off-gas from dissolver nitric acid jacket removal. However, no means have been entirely successful and emphasis is being placed on the search for a chemical agent to remove or destroy the nascent hydrogen. Further progress has been made in scaling up experiments of ruthenium removal from Redox uranium product solution by ozone sparging, which, if successful, can eliminate head-end volatilization and the contamination of the Redox plant environs. Flexual tests on irradiated Kel-F plate material indicate a life expectancy of two years at twenty times expected Purex HC Column flexural stresses. After several months development testing in cooperation with the Design Section, a satisfactory capacitance-type interface detecting probe has been demonstrated for the Purex 2A Column.

Process evaluation studies in view of the low MWD/T program show considerable advantages for a Bipex process, which is a combination of the Bismuth Phosphate process, the TBP process and a new solvent-extraction final decontamination cycle for plutonium product. For the low MWD/T material a capacity of 180 to 200 tons for each Bismuth Phosphate plant appears possible.

Evaluation studies of experimentally prepared cold closures formed by upsetting a heavy can wall section have indicated that the quality of the

point pressure weld is improved by: (1) Providing sufficient roughness on the end of the slug to prevent flow of aluminum in a thin layer adjacent to the end of the slug and (2) machining a small recess or dimple at the center of the slug end to allow flashing of part of the aluminum oxides out of the plane of the cap. Closures formed on slugs having the recess and the roughened surface have been examined metallographically and etched with 30% sodium hydroxide and appear to be free of oxide stringers throughout the major portion of the cap thickness.

Four ruptured and two normal slugs were received from production test 25M which was to evaluate uranium slugs machined from salt-bath beta heat-treated, Fernald rolled rods. The four ruptures were of the cap failure type. Detailed observations revealed that the three cap assemblies which were received were good; that the uranium metal was concave at both ends to as much as 0.050 inch; that carrot-shaped cavities along the center line of the slug existed from the cap end of the uranium to a depth of over one inch; that the uranium was eccentrically canned; and that the overall length of the outerperiphery of the uranium had increased. Further work to evaluate the metallography and crystallography is now in progress on selected samples from these slugs.

The four enriched cored slugs which were charged in the hot spot of C Pile in February have now accumulated an exposure of approximately 1300 MWD/T.

A preliminary study has been concluded of the critical mass problems which would arise in the Purex Plant if enriched uranium were to be processed there. Considering uranium of 1.75% U-235 as an example, in dissolving operations safety can be assured only by limiting batch size to about 340 kg of U or by constructing dissolvers of "always safe" diameter, which would be 15-20 inches. In the remainder of the plant, again considering 1.75% U-235, none of the major processing components are "always safe"; however, flowsheet concentrations are all below the chain-reacting limits by about a factor of two. Thus, if adequate control of concentrations and safeguards against precipitation could be provided, operation with 1.75% U-235 would be feasible.

Buckling measurements of the 8-3/8" lattice loaded with J and Q slugs have yielded a value 68 microbucks higher for the dry than for the wet lattice. This is to be compared with a difference of 38 microbucks for a similar lattice loaded with natural uranium. Thus, the J-Q loading is more hazardous in respect to the consequences of loss of cooling water.

Laboratory tests of a Redox head-end treatment involving the addition of manganous ion prior to permanganate resulted in an overall ruthenium DF of 12 with but only 11% of the ruthenium going to overhead. Similar factors were obtained on application of the treatment to 2D feed solution.

DESIGN SECTION

Design Section effort for the month was distributed approximately 30% to Expansion Program activities, 16% to Reactor Plant Modification for Increased Production, 36% to Research and Development and 18% to other projects and design orders.

Activity on Project CA-513 Purex Tank Farm condenser revisions continued forward on a priority basis. The first phase of design, which eliminated the present surface condenser from the lump sum construction contract, was completed. Design for the new contact condenser was advanced 17% during the month to 20% complete.

Other activity on the Expansion Program was as follows:

a. Project CA-514, 300 Area Expansion design was completed with the exception of new items of equipment and design field liaison. Design of the ultrasonic bond test equipment was started.

b. Detailed design for 1706 KE Recirculation facilities was started and progressed to 15% complete. Design Scope is essentially complete.

c. Acceptance test procedures for CG-551, Expansion of 234-5 Facilities were completed and approved. This completes design activity with the exception of design field liaison and mockup and testing of RM Line components.

d. Work continued on construction as-builts, design revisions, and design field liaison for the 100-K Reactor Plants and Purex Separation Facility.

Authorization of Project CG-558, Reactor Plant Modification for Increased Production, totaling $26,800,000, was received from the AEC. The directive included authorization to provide design for maximum process water flow at F & H Reactors. A revised project proposal incorporating the changes imposed by the directive, as well as establishing new cost estimates and schedules, is being prepared. Design scope is being revised to include new water flows at F & H. Detail design is 26% complete, not reflecting changes imposed by the directive.

Design for the Purex nitric acid fractionator facility is proceeding on the basis of furnishing critical layout dimensions to a "design and fabricate" vendor who will design the major equipment. This will enable G. E. design of the process piping and the structure to proceed concurrently with the vendor design.

Studies were initiated in Separations Research and Development on increased capacity for the UO_3 Plant and startup of the B Plant, in line with recent process requirements. Work was also concentrated on the Redox

Plant contamination problem. Increased separations plants capacity studies and new separations plant development studies proceeded on a limited basis 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	51%	50%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	94
	Reactor & Bldg.	100	87
	KE - Water Plant	93	77.8
	Reactor & Bldg.	70	71.7
	General Facilities	92	85.5
CA-513	Purex Facility, Part "A"	54	48.6
	Part "D"	53	60
CA-514	300 Area Expansion	50	40
CG-535	Redox Capacity Increase, Phase II	70	64
CA-539	Redox 241-SX Tank Farm	99	99.5
CA-546	Fuel Element Pilot Plant	25	13
CG-573	Hanford 3X Program - 300 Area	89	93

On June 25, 1954, Minor Construction Service forces completed 1,000,000 man-hours over a 14-month period without major injury.

At 105-KW Reactor, vertical safety rods were installed, and about 75% of the VSR cylinders were set. Horizontal control rods are being set and aligned. Front face crossheaders are being tested hydrostatically. Three primary pumps at 190-KW have been completed with new bowls. None of the secondary pumps have been satisfactory.

Boiler #1 in 165-KW was fired and is being run on a preliminary basis. Other installations at 165-KW were continued. Five pumps and three ball valves at 181-KW were in operating condition. At 105-KE Reactor, the preliminary air test was begun on June 22. "Vanstoning" of process tubes was about 70% complete, and is awaiting completion of unit air test. The first rear face riser was set at 105-KE, and outlet crossheaders are being shipped to 105-KE Building. In 100-KE Water Plant, progress consisted of setting secondary pump drives, boilers, turbines, and switchgear. Construction was estimated as about three months behind the 100-KW Water Plant.

Concrete block work at the east end of 202-A Building was finished, thus completing enclosure of the Canyon Section. Overall completion of concrete for 202-A was 97%, and the built-up roofing was essentially completed.

In the cell walls, installation of kickplates advanced to 75% complete (520 to date). Welding in the Hot Pipe Trench was 32% complete. Process equipment installation included vessels TK-101, 103, 305, 310, F-324, and two vacuum pumps. Installation of heating and ventilating equipment in 202-A was 40% complete and power take-off rails for the remote crane were started. At 291-A Fan House, three blowers were set, and the concrete air tunnel was completed. Fabrication of the stainless steel liner for 291-A Stack was started by the vendor in Tacoma. At 211-A Tank Farm, structural concrete was completed, and steel erection was completed for Tanks 20, 21, 40, and 41.

ORGANIZATION & PERSONNEL

Total on Roll, June 1, 1954	1,499
Accessions	37
Separations	36
Total on Roll, June 30, 1954	1,500

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

ENGINEERING ADMINISTRATION SUB-SECTION

JUNE 1954

June 23-25, inclusive, Classified Files suspended operations to accomplish conversion of the daily routing records to IBM. The cafeteria of Chief Joseph Junior High School was used for this purpose, and all Files personnel reported to this location to accomplish the conversion.

With completion of the conversion of the daily routing records to IBM, it is possible now to prepare inventory listings of individual document holdings on any frequency desired. Starting in July, a cyclical 30-day inventory of all classified documents routed is to be instituted, with the inventory to be a "self-inventory" made by the document holder.

The first of an annual Security-Document Control Conference within the Atomic Products Division was held at ANP, Cincinnati, May 15 and 16. The Classified Files supervisor was Hanford's representative.

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. The original subject matter of said modification will be incorporated in the final close out of the contract.

2. Special Agreement No. G-44 between General Electric and the City of Kennewick covering the use of a Government-owned chlorinator was returned by the City of Kennewick for a revision regarding the use to be made of the chlorinator by the city. Since that time the AEC has indicated that it may wish the contract withdrawn by General Electric to permit the AEC to handle the transaction directly with the City of Kennewick.

3. 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 approved by the Commission June 21 and by the Appraiser June 24.

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. The Commission returned this agreement requesting that additional verbage be added to the agreement identifying the damaged cable (which is the subject of the agreement) as the cable actually damaged in the accident.

5. Consultant Agreement No. 123 between General Electric and Applied Research Laboratories of Glendale, California, covering quantrometric analyses of isotope samples was executed by Applied Research on June 22.

6. Special Agreement No. G-45 between General Electric and Travelers Indemnity Co. covering inspection of freight and passenger elevators has been approved by AEC and was forwarded to the contractor for execution June 30.

7. Modification No.3 to Rental Agreement No. G-8 between General Electric and Industrial X-Ray, Inc. providing an extension of time of the contract was sent to the AEC for approval June 14.

8. Modification No. 1 to Special Agreement No. G-39 between General Electric and Telefilm, Inc. of Hollywood, California, covering a change in security requirements to be observed and clarifying General Electric's liability to pay for transportation charges of classified material was sent to the Commission for approval June 30.

9. Modification No. 1 to Special Agreement No. G-30 between General Electric and Charles Bruning Co., Inc. covering an extension of time of the contract was sent to the Commission for approval June 30.

10. Modification No. 1 to Special Agreement No. G-31 between General Electric and Abadan-Spokane covering an extension of time and the revision of the contract price was sent to the Commission for approval June 30.

11. Modification No. 3 to Special Agreement No. G-38 between General Electric and Morgan Wheeler and Co. and Hugh H. Russell covering an extension of time has been prepared, prior approval obtained from the Commission, and is now being processed for execution.

[redacted]

HW-32317

PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JUNE, 1954

SECRET

VISITORS AND BUSINESS TRIPS

M. R. Fenske visited here from Pennsylvania State College, State College, Pennsylvania, June 14 through 18, 1954, for consultations on reactor processes.

T. C. Runion visited here from the National Lead Company in Fernald, Ohio, June 29 and 30, 1954, for consultations on uranium and thorium and to attend MDAC meeting.

C. Wheelock visited here from North American Aviation, Inc., Downey, California, June 28 and 29, 1954, for technical consultations on the reactor safety element.

J. M. Atwood, S. Goldsmith, and C. D. Wilson visited Westinghouse Atomic Power Division, Pittsburgh, Pennsylvania, June 15 and 16, 1954, to attend the A. E. C. Corrosion Symposium. Mr. Atwood and Mr. Goldsmith went on to Knolls Atomic Power Laboratory, Schenectady, New York, to discuss recirculation loop operation, June 17 and 18, 1954, and Mr. Wilson went to the Aluminum Company of America, New Kensington, Pennsylvania, June 17, 1954, to discuss corrosion problems.

L. P. Bupp visited North American Aviation, Inc., Downey, California, June 28 and 29, 1954, for technical discussions on graphite.

R. S. Paul, G. E. Wade, and M. R. Wood visited Phillips Petroleum Company, Idaho Falls, Idaho (Arco), June 30 through July 15, 1954, for work on the installation of GEH-4.

W. J. Morris visited the Huntington Rubber Mills, Portland, Oregon, to discuss special gear design, and the Haseltine Company, Portland, Oregon, to discuss rubber seal fabrication, on June 23, 1954.

C. R. McNutt and J. M. Roberts attended the American Society of Mechanical Engineers' "Heat Transfer and Fluid Mechanics Institute" at the University of California in Berkeley, June 30 through July 2, 1954.

ORGANIZATION AND PERSONNEL

	May	June
Administrative	5	5
Pile Development	65	65
Pile Engineering	77	78
Special Irradiations	24	24
Technical Liaison	4	4
Total	175	176

Pile Development: One Engineering Assistant 12 was hired for the summer, and one Junior Engineer terminated.

Pile Engineering: One Mechanical Engineer and two Engineering Assistants 12 were hired, one Engineer II transferred in from Fuel Technology Sub-Section, one Secretary C went on Leave of Absence because of pregnancy, and one Engineering Assistant 15 and one Junior Engineer terminated.

PROCESS TECHNOLOGY

Power Level Limits

During June all piles except C were limited by trip-before-boiling considerations and were held to 95 C tube outlet temperature except B which operated at 100 C maximum. C was limited to 950 kw/tube maximum. The effective number of tubes was severely reduced because of loss of reactivity as a result of decreasing concentration from 625 to 200 MWD/T.

Process Changes

Seven Process Specifications - Reactor Process, were revised. Specification 16 governs water supply to the reactors during shutdown periods and limits the bulk outlet temperature during operation to 92 C; specification 25 limits exposure as required by product quality considerations and specification 26 limits exposure for corrosion and rupture rate reasons; specification 54 defines minimum number of vertical safety rods and ball 3X units and permits limited enrichment of 29 VSR piles; specification 56 governs use of Beckman Radiation Monitoring equipment during operation, startups, and shutdowns; and specification 59 requires that during an outage sufficient temporary poison columns, HSR's, and/or cadmium splines be in the pile to keep the unit sub-critical if the VSR's are withdrawn.

Slug Rupture Experience for June

Uranium Failures - Twenty-one failures occurred in normal uranium slugs during the month, eighteen at C Pile and three at F Pile. In addition, one C Pile and one F Pile tube loading was discharged for suspected ruptures, but these could not be confirmed.

At C Pile three uranium cleavage failures, and two as yet uninspected occurred in Group 11 metal. The other thirteen failures at this pile, six cap failures, one side failure, five cleavage failures, and one as yet uninspected occurred in metal charged under PT 313-105-25-M.

The failures at F Pile were all cleavage failures of four-inch, triple-dip canned pieces.

Irradiation Behavior of 25-M Metal

The rupture rate of 25-M metal continues three to five times that of eight-inch triple-dip canned metal at all areas where a comparison is possible.

Failures in Non-Uranium Loadings

Five ruptured Al-U-235 J pieces were discharged from DR Pile during the month. One of these was swollen near the middle indicating probable water penetration of the jacket, one was swollen at the cap end, and the other three exhibited longitudinal splitting of the can wall. Most of these ruptured pieces emitted radioactive gases. After the first two of these pieces had been picked up, two holes were drilled in a J slug which showed no evidence of water penetration. Gas bubbles which issued from these holes were collected for analysis. Radioactivity decay measurements identified the gas as xenon-133.

Irradiation of New Fuel Slugs

Cored Slugs - Production Test 105-570-A - This test has been approved and authorizes the irradiation to failure of four tubes of cored uranium lead dip canned slugs and of four control tubes. Two pairs are to be irradiated at high tube powers and two at low powers.

Mechanically Bonded Slugs - Production Test 105-575-A - This test has been approved authorizing the irradiation of four mechanically bonded, point pressure welded slugs for metallurgical inspection. Two tubes are scheduled; one for 200 MWD/T exposure and one for 600.

Powder Metallurgy Slugs - Production Test 105-576-A - A production test authorizing the exposure of one tube of slugs prepared by powder metallurgy techniques to rupture at C Pile and of about a thousand slugs to normal exposure at F is circulating for approval.

Hot Pressed Slugs

A production test for irradiation of slugs prepared by hot press canning has been prepared to rough draft form. Solid, cored, and control tubes will be irradiated to failure.

Unbonded Slugs - Production Test - 105-578-A - A production test to irradiate to failure two tubes out of four of unbonded solid, unbonded cored and control slugs is circulating for approval.

Investigation of Rupture Mechanism

Thermal Cycling of Slugs - Production Test 105-566-A - The enriched uranium slugs charged at H Pile for the thermal cycling experiment have been operating for two and one-half months and have been subjected to approximately 400 cycles. The enriched pieces are at an exposure comparable to that of the highest powered slug in a tube of 250 MWD/T. Core temperature is varied from a maximum of 300-350 C to a minimum of 175-200 C.

Manufacture of Other Products

Preliminary Irradiation of J-Q Columns - Production Test 105-567-A - Thirteen tubes containing 19 alternate J and thorium pieces have operated without incident at H Pile since 3-14-54. One tube is scheduled for discharge in July and arrangements have been made for special separation at ORNL to determine the product vs. exposure value.

P-10 Irradiation at C Pile - Production Test 105-562-A - The ability of present fuel and target pieces to operate successfully at high powers is being investigated at C Pile. Sixty tubes have been exposed since the middle of February; forty contain hot-pressed fuel slugs, the balance being cold canned or Al-Si bonded. No failures have occurred up to the present exposure) Several tubes of each type were discharged in June but weight loss data are not yet available.

File Studies

Economic Analysis of Use of Enrichment - An economic analysis of the use of enrichment pieces is being made and will be completed next month. Experience at H Pile and predictions for C Pile are being considered.

Use of Enriched Uranium in U-233 and Plutonium Production

The substitution of enriched uranium for J pieces in U-233 production loadings appears feasible technically, but no economic benefits are apparent except at a greatly increased U-235 inventory.

A study of the use of mixed tube charges of enriched uranium and depleted uranium for simultaneous production of high and low g/t material appears very attractive. This could be especially important with current metal shortages since such an irradiation would make possible the use of depleted uranium stocks from irradiation and cascades.

PILE PHYSICS

K Pile Startup Planning

The experimental program for K Pile startup as currently conceived was presented for discussion at a joint Manufacturing-Design-Technical Startup Council meeting during the month. There appeared to be general concurrence with the objectives and methods proposed, largely as outlined in HW-31606. Preparation is being initiated of a document in cooperation with Manufacturing outlining the tests and startup plans in sufficient detail to request management approval. Preliminary investigation of material requirements indicates that there should not be undue difficulty in securing suitable test facility liners for control and monitoring chambers, in blanking off some 800 pigtails to maintain a dry reflector, or in marking reject slugs to withstand temperatures up to 200 C.

The K Pile control and safety systems and probable operating conditions are being reviewed in developing bases for nuclear control specifications for the K Piles.

Dry Pile Temperature Coefficient Test

Twelve thermocouples in experimentally fabricated thermocouple slugs tested at 200 C with subsequent quenching still agreed within 1 C on being reheated to 200 C. Methods have been devised for attaching the thermocouples solidly to the endcaps and holding the leads securely against the slugs. "Dry runs" with natural uranium reject slugs will be made in the experimental process tube assembly at 108-D to establish proper charging procedures.

Scram Transient VSR Evaluation - Production Test 105-554-A

Anomolous results have been obtained in the two sets of scram transients run at C Pile between side test hole chamber and under pile chamber indications. During the first run on May 20, a control system value of approximately 2200 inhours was indicated by the side hole chamber whereas the under pile chamber indicated the control system strength to be approximately 1500 inhours; the large value is more

nearly what would be expected from calculations and from startup tests. During the second set of transients on June 9, two transients recorded with the same Beckman-chamber combination as used previously agreed with the previous set, whereas four transients recorded with the Beckman recorder inter-changed gave higher results by about 300 inhours in both cases; the control system strength indicated by the sidehole chamber in the latter case was still much greater than that indicated by the under pile chamber.

Instrumentation checks and a check on chamber position effect are planned for the test pile prior to running a third set of scram transient measurements in the C Pile. Document HW-32132, "Scram Transient Analysis Dependence on Detector Position," describes the theoretical basis for expecting some such effect.

Pile Safety Studies

Investigation of the relation between the necessary Beckman trip settings and allowable VSR withdrawal rates is nearing completion. Relations derived in WAPD-13 or power level transient versus time rate of reactivity increase are being used to calculate limiting cases.

An analysis of the power transient behavior of a pile following instantaneous loss of water pressure has been initiated.

Isotope Yield Calculations

Equations relating the ratio of Ru103 activity to Ru106 activity as a function of uranium residence time in the pile and out-of-pile decay time have been developed. The derived curves, to be issued in a document, are to be used by Radiological Sciences in estimating the age of and/or identifying the origin of certain ground contaminations.

Long Term Gains Studies - Production Test 105-553-A

The first tube of the six being irradiated under this production test was discharged June 3 at an average exposure of 100 MWD/ton. These slugs will be held in the F Pile basin until arrangements are completed for hot slug reactivity testing in the Test pile.

Heat Source Density in the Thermal Shield

Because the carbonization rate of shield masonite and therefore its loss in moderating ability is greatly enhanced by elevated temperatures, an accurate and detailed knowledge of the sources of heat in the shield should assist in devising the most practical control methods. A theoretical calculation of the gamma flux intensity and energy spectrum in a side thermal shield has been made. Although the calculated gamma intensity at the biological-thermal shield interface agrees with intensity measurements in the DR test wells, the calculated energy release is less by a factor of two to three than actual flow and temperature measurements indicate.

Simulated Shield Burnout Test - Development Test 105-548-A

Foils from the fourth phase of this test have been removed from the test wells and are now being counted. Re-checking of foil activity calculations following the third phase revealed an error in the length of pile exposure period used for the run. Correction of data to the proper operating interval results in an increase in flux due to third phase masonite removal of a factor of ten rather than of over one hundred as reported last month.

Sulfur Pellet Detectors for Fast Neutrons

The newly designed compressed sulfur pellets were placed for irradiation in the magnetite-limonite slabs which had been heated out of pile at 100 C after removal of the bare and cadmium-covered gold detectors. This new type of pellet may be beta counted immediately upon removal from the pile, eliminating preparation of the elastomeric discs containing irradiated powdered sulfur. Calibration tests are planned in order to compare the activity per gram of sulfur irradiated by the two methods.

Counting and Detection Instrumentation and Techniques

The new type GM tube external quench circuit described in the March, 1953 issue of Nucleonics was built by Instruments personnel and is now being tested. This circuit is designed to reduce the "dead time" of the tube by a factor of over 100, thereby permitting higher counting rates and reduced counting time of foils.

A new type of cadmium cover similar in shape to salve cans has been developed in two sizes to replace the former method of hand covering gold foils and sulfur powder. The larger size will hold the newly developed 7/8" diameter sulfur wafers and the smaller size will enclose 1/4" diameter gold foils. The time for preparing a neutron detector traverse for the shield test well facility will be approximately halved by use of the new covers.

An experimental fast neutron dosimeter has been designed based on an Oak Ridge development. The response in this instrument is due to recoil protons generated by neutron collision with hydrogen atoms in a plastic "radiator" in the bottom of the chamber and in the methane counting gas. Because the shape and size of the chamber must be modified to fit shield test well slots, the biasing methods used at Oak Ridge can not be used directly and experimental dose rate calibration will be required.

Masonite Damage Experiments

Arrangements are underway to use the Vernitherm pit in the F Pile basin to check masonite deterioration when subjected simultaneously to heat and gamma radiation. The oven which is to be lowered into the facility is being calibrated and checked for heat distribution. A helium atmosphere will be used in the experiment.

Analysis of Masonite Deterioration Data

The end result of masonite deterioration after an extended time at a given temperature is a carbonized residue. Although the lower limit of the amount of remaining residue is uncertain, sufficient indication is given by deterioration

rates which have been observed to make approximate estimates of the remaining shield effectiveness. Cross section values were used in conjunction with estimated composition of the residual masonite to arrive at the remaining "slowing down" power for various neutron energies. The results of this calculation indicate that in the range from thermal to 1 Mev. neutrons 1 to 3% of the original thickness of masonite is equivalent in moderating ability to the carbonized residue.

HEAT STUDIES

Cooling-By-Boiling Studies

Cooling-by-boiling tests were performed on the tube mock-up at 500 psi rear header pressures, tube powers (uniform) of 250 and 400 kw and inlet temperatures of 100 F and 200 F. Satisfactory "slug" cooling was obtained with flows as low as 2.2 to 4.5 gpm, and the corresponding outlet steam qualities varied from 35 to 60% by weight. (The lowest flows were reached on the 250 kw, 100 F tests.) Attempts were made to run tests with 600 kw tube powers but it was found that the existing pump capacity was inadequate. This latter fact was not surprising.

In order to perform tests at higher powers and higher back pressures, an additional pump was added to the system. Further, pressure testing was performed and shields were erected to ensure personnel safety. Tests are now being accomplished at the higher powers, and it is expected that tests will be attempted at 800 psi soon.

Continued difficulties have been encountered in finding a suitable method for fabrication of high pressure process tubes. Consequently, an alternate design was prepared and submitted to prospective vendors. These process tubes are to be made of stainless steel and are to have removable ribs. The latter are desirable in order that one tube may be used for tests with several different annuli. Investigations are being carried out to find a suitable insulating rib material. To date, several possibilities have been tested and have been found to be totally unsatisfactory.

Plans have been made for plant forces to install a foundation for the new generator. It is probable that the use of the existing generators will be lost for about three weeks while that work is in progress and thus a definite date for the foundation work has not been established. However, the work may begin by July 6. Use of the existing generators will be lost because they cannot be operated under the heavy dust conditions which will exist during the foundation work.

Pile Panellit Trip Limits

As a result of experimental studies and subsequent analysis, recommendations were made to alter the method by which tube temperature limits are established at B, D, F, DR, and H Piles. These temperature limits refer only to those based on panellit settings, and the recommendations were contained in "Tube Temperature Limits by Trip-Before-Instability Concept and Other Methods," K.G. Toyoda, HW-32151, June 16, 1954. In the past the temperature limits have been such that a decrease in flow which would cause the outlet temperature to equal the rear crossheader saturation temperature would also cause a panellit trip. It has been found, however, that unstable flow conditions do not exist in the tube until a considerably greater decrease in flow exists than that at which the outlet temperature equals the saturation temperature. (This is true only for high flow or

high power tubes.) Consequently, it has been proposed that the temperature limits be based on flow instability. A result of this recommendation will be to allow outlet temperature limits in the central zones which are higher by 5 - 10 C than those allowed by the previous method. Another important recommendation was that the small cone screens in the same piles be replaced with larger, "unpluggable" screens when appropriate and that the tube temperature limits be subsequently based on the panellit upper trip. Such action will permit still further increases in temperature limits for tubes throughout the piles. The document also points out that there is some uncertainty as to the results of a local power excursion which would cause boiling in a tube. Such a condition would be detected by the panellit upper trip, and the trip circuit would be actuated before any damage could occur. However, it has not been demonstrated that no damage would result, and the recommendation was made that tube outlet temperatures be limited normally to a value 15 C below the temperature at which boiling would occur. Various means exist to warrant the relaxation of this 15 C limit, and the merits of each are presently being considered.

It has also been found that flow instability occurs in low flow or low power tubes at the B, D, F, DR, and H Piles at higher flow rates than previously realized. This is discussed in "Technical Note Concerning an Inadequacy of the Panellit Low Trip," R.F. Recht, HW-32010, 6-2-54. This condition has no significant effect on pile safety, however.

Secondary Panellit System Under Project CG-558

A dual panellit system is to be installed at each pile under CG-558, and present plans call for separate pressure lines from each process tube to each of the two panellits. An investigation was made, however, to determine whether separate pressure lines were warranted in view of many differences between the existing arrangement and that which will exist after the CG-558 modifications, It was concluded that the possibility of one of the lines becoming plugged under the new design was quite remote. Consequently, a recommendation was made that the second line be deleted from the Project in "Recommendations Concerning Secondary Pressure Monitor System, CG-558," H.H. Greenfield, HW-32108, June 11, 1954.

Tube Fitting Modifications for CG-558

Present plans call for modification of the tube inlet fittings of the existing piles under CG-558. However, it is doubtful that any gains can be made from modifications to fringe zone tubes. Consequently, a verbal recommendation was made to the Design Council through the Technical Liaison Unit that the fringe zone tube inlet fitting modifications be deleted from CG-558.

Hydraulics Laboratory Studies

A report "K Pile Tube Pressure Drop Flow Characteristics," H.H. Greenfield, HW-31992, June 1, 1954 was issued. It presents isothermal flow-pressure drop characteristics for the K tube, fittings and loadings. In addition, correction factors are applied for conversion to non-isothermal conditions.

A type of cavitational flow which induces vibration in the rear crossheader has been observed in tests of the B, D, F Pile outlet fittings. This is discussed in

"Cavitation in the Outlet Fittings at the B, D, F Piles," H.H. Greenfield, HW-32029, June 3, 1954. This vibrational condition is not believed to represent a serious problem.

Slug Heat Output After Pile Scram

Tests were conducted in the laboratory to measure the rate at which slugs lose their sensible heat following a pile scram. Knowledge of this subject is important because a relatively large amount of heat is stored in the slugs. It was found that essentially all of the heat is dissipated in about one minute following a simulated vertical rod scram.

Steam - Water Flow in Pile Outlet Piping

As pile power levels are increased, the point is approached at which flashing of the water to steam in the outlet piping (crossheaders, risers, downcomers, etc.) will occur. At the present time the effect of such flushing on pile flow and piping pressures is unknown. However, an analytical investigation is underway and preliminary results look encouraging in that the pressure drop from the top of the downcomer to the 107 Basin appears to be small for bulk outlet temperatures as high as 110 C. This investigation is continuing since large power level increases may be realized if such flashing can be permitted.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

Bids from vendors on the spectrometer unit portion of projects CG-578 and 579, the projects to replace the existing beta systems at all areas except [redacted] with gamma slug rupture detectors, will be received by Design early next month. Final design of the turret assembly is complete and bids requested. The prototype gamma monitor at H Pile continued to operate satisfactorily. A report discussing the electronics of the gamma monitor, HW-32166, "Dual Channel Pulse Analyzer and Count-Rate Meter for Gamma Spectrometer Monitor," R.S. Paul and M.R. Wood, has been issued.

A more compact model of a portable gamma sensitive scintillation survey meter was designed, fabricated, and tested on-pile. This instrument was demonstrated to possess in excess of a ten fold greater sensitivity in isolating tubes containing a rupture than present methods; this sensitivity is comparable to that demonstrated previously with an initial, bulky design. Several instruments will be provided Operations for routine application and performance testing.

The preliminary design of a "gamma-scan" system, a system comprised of a crystal, photomultiplier and collimator assembly mounted at lattice unit intervals across the rear elevator, has been completed and some components requisitioned for an initial test installation. In this system the rear face is scanned for high activity, e.g. rupture containing tube or lodged fuel element, by rapidly switching signals from the detectors intermittently displaying these signals on an oscilloscope to yield the horizontal scan, and using the elevator to provide vertical displacement of the scanning unit. Present data indicate that in some instances such a system can locate the tube containing a rupture during pile operation; the

real effectiveness of this latter feature needs to be demonstrated through on-pile tests, however.

The slug rupture detector designed for the fuel element irradiation facility at Arco has been placed in operating condition at that site. Personnel will assist in the startup of that facility early next month.

Neutron Economy Studies

A more complete measurement of the radial distribution of fissions in an enriched uranium slug (E metal slug) has been made in which particular efforts have been made to trace the distribution in detail near the slug surface; the large gradients in the distribution at this location in enriched slugs makes extrapolation to the surface uncertain. These recent data indicate that the values reported last month for the relative power generation rates in natural uranium versus "E" metal, which were based on earlier and rather incomplete traverses, are too high. It now appears that the power generation factor, i.e. power generated in an "E" slug relative to natural uranium in the same pile location, is nearer 1.7 than 1.85. Work presently underway will firm and refine this estimate.

Neutron flux traverses in "J" slugs (7% U-235 in aluminum) have demonstrated that a significant fraction of the total capture in U-235 results from neutrons possessing energies above 0.3 ev. This has also been demonstrated in measurements of resonance escape probabilities performed in the Test pile. This factor is important in some types of lattice calculations and must also be accounted for in certain methods of determining resonance escape probabilities.

A refined experimental assembly has been fabricated to facilitate accurate measurements of the metal temperature coefficient of reactivity. The precise value for this coefficient was somewhat uncertain in earlier work because a severely modified lattice cell was employed in the interests of obtaining the maximum amount of data quickly. A program of refined measurements employing several types of slugs of immediate interest to Hanford will be carried out next month.

Instrument Development

The modification of the low level period trip system, which was specified for the K Piles, has been completed and the modified system performance tested in the Test pile. The system now appears to operate satisfactorily; the time delay is one and one half periods for periods between one and twenty seconds and longer multiples of the period in the case of shorter periods. Circuit modification has greatly reduced the probability of a false scram on periods longer than twenty seconds.

The major modifications to the high level period trip system have also been made and the time delays appear to be under one period. Much of the electronics in this system has been replaced by a relay system which should improve the life and stability of the system.

All components for the sub-critical multiplication monitoring system have been requisitioned. It now is planned to install this system in the C test hole at

DR Pile during a September outage. A facility of special design is being developed jointly with Mechanical Development for the C hole to permit thorough testing of this system.

Outlet Water Temperature Monitoring Facilities

Drawings of the Flexowriter automatic tube outlet water temperature recording facilities being installed at D, DR, and F Piles were reviewed and several improvements in system design recommended. These recommendations were given Instrument Design.

The test of the twelve point prototype of the K Pile temperature monitor continues at H Pile. Numerous incidents of component malfunction are developing with continued service of this system; many of these appear to be mechanical failure of components which was not evident at the time the interim report on this test, HW-31890, "Interim Report, Development Test No. 105-564-A, Temperature Monitor Prototype Test," D.E. Stephens, was issued. Up to the present two of the twelve resistance thermometers have also become inoperative. These cases of malfunction are being investigated and the results will be transmitted to Design personnel.

A study of feasibility of supplementing pressure and flow monitoring instrumentation with a temperature monitoring system to provide trip-before-instability protection in the event of power surges is nearly complete. The study considers the cases in which temperature monitors are installed on (1) one tube in a block of nine, (2) one in twenty-five, and (3) one in sixty-four and activate the safety systems as a predetermined temperature is reached. The cost of providing such a system, considering several alternative designs, is currently being developed.

Pile Transient Simulator

A simplified version of an electronic analog computor is being constructed in support of pile safety studies. The simulator under development employs several integrating and summing networks so as to include five groups of delayed neutrons in solving the pile kinetic equations. The initial systems will yield pile power as a function of time for step-wise reactivity additions; it is believed that refinements will yield pile power versus time as reactivity is introduced (1) at a constant rate and (2) at an arbitrarily selected rate.

Measurement of Fast Neutron Distribution

Nearly four hundred proton tracks have been measured in a nuclear emulsion plate irradiated in the Test pile to yield the proton recoil energy spectrum. This number of recoils is still insufficient to yield a statistically significant incident neutron spectrum and the counting is continuing. Preparation for the measurement of the fast neutron distribution in KW Pile is continuing.

Physical Constants Test Reactor

The building to house the Physical Constants Test Reactor is designed and the Atomic Energy Commission has requested bids for construction. It is expected that the bids will be reviewed late next month.

The design for the graphite portion of the reactor is complete, the graphite is available, but the graphite machining is temporarily delayed until certain problems associated with the use of 2101 facilities are resolved. The control rods are designed and fabrication has been initiated. The final design phases of the vertical safety elements are being completed and fabrication will start next month. The remaining mechanical design is expected to be completed next month as well. The fuel for the reactor and the control rods has been ordered for September delivery.

The hazards study to be submitted to the Advisory Committee on Reactor Safeguards is substantially complete. The remaining effort on this study is directed toward minimizing any potential hazard to 300 Area in the event of safety system failure concurrently with extremely large reactivity addition to the reactor with subsequent fuel vaporization. It appears that excursions resulting from reactivity additions smaller than 2 to 3% K will not lead to a serious hazard.

Test Pile - Routine Tests

Regular metal testing proceeded routinely during the month. Seventeen billet egg lots were tested to yield TDS values ranging from 15 to 18. Two lots of machined billet eggs were tested in the eight egg test to yield TDS values of 14 and 15. The billet egg tests are continuing to indicate low purity uranium and there is some recent evidence from tests on machined slugs that this effect is beginning to show up in bulk materials received at Hanford.

Test Pile - Special Tests

Two groups of twenty-two four inch natural uranium slugs prepared by Sylvania using powder metallurgical techniques were tested relative to uranium metal standards. This material would cost about fifty inhours for a complete 105 pile loading. Slugs containing about 0.2 weight per cent silicon were also tested to yield a fifty inhour loss in a fully loaded 105 pile.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

The development program for segmental discharge proceeded during the month with the fabrication and testing of the inflatable spline. Preliminary testing has indicated that the procedure of holding the upstream portion of slugs and flushing the downstream portion is feasible. Since there are no facilities on site to fabricate a full length spline a Research and Development Contract is being negotiated to obtain one.

The Poison Column flushing tests for 105-K were continued during the month and all types of slugs were washed out satisfactorily with the exception of normal eight inch pieces. A special tip-off was required to prevent these slugs from sticking at the outlet.

Horizontal Rod Studies

The horizontal control rod conversion program is nearing completion. The half-rod is completely assembled and scheduled for installation in the #8 rod opening at

105-F during the next shutdown. The other two rods of the replacement design installed at B and H Areas are still operating satisfactorily.

The built-up washer seal that was installed on the "A" rod at C Pile has now been removed and replaced with the molded ribbed sphincter seal for development testing.

The Design Test of the 105-K horizontal rod continued during the month. Assembly of the mock-up is complete except for the installation of the rod itself. Preliminary testing disclosed that the inner rod room thimble was not straight and prevented the rod tip from entering it. The graphite bearings have been overbored and it is expected that this will eliminate the binding. Difficulty was experienced with the emergency drive system in that the drive motor would not come up to full speed at no load. To eliminate this it is necessary to install a relay in the normal drive circuit which will open the normal field and tachometer circuits when the emergency drive is activated.

Vertical Rod Studies

The vertical safety rod tube, latch and 3X tie-in switch for the K Pile Design Test were installed in the test tower at White Bluffs. Considerable difficulty was experienced in getting the latch to operate satisfactorily. Quite a few minor changes have been made in the design of the switch and at month's end satisfactory rod drops are being obtained. The endurance test of 1000 drops will be started early in July.

Supplemental Control

Work on the disaster control system during the month was limited to consultations with Design and to studies and plans for experiments necessary to the proper evaluation of the graphite wetting system. Outlines for tests on maximum water removal and flow rates in the graphite stack are substantially complete.

In conjunction with the development of the poison spline control system, a modified cap and seal have been tested. The principle of the operation has been proved and no leakage is encountered when the spline is withdrawn through the seal. An order has been placed to have a vendor fabricate the neoprene seal. A motor driven withdrawing reel is in the process of being fabricated.

Process Tube Assembly and Piping

Flexure testing of the production pigtails for K Pile continued in the 189-D laboratory. There seems to be very little difference in the flexing characteristics of these connectors and it is believed that they will be satisfactory in every respect.

The "O" ring slip joint connectors that were proposed for 105-C outlet use are still performing satisfactorily on the pile. At last inspection, there was no evidence of leakage or deterioration of the "O" rings.

Design and drafting continued during the month on the flexible connector testing facility to consist of a nine nozzle mock-up for high pressure, high temperature flow. The facility will be quite versatile insofar as lattice spacing, flexing distances, and pigtail configuration are concerned.

Materials Testing Reactor Test Facility

The Materials Testing Reactor Test Facility is now essentially complete. The equipment has been installed at Arco, tested, and is awaiting approval for insertion by the Phillips Petroleum Company. The first fuel elements are expected to be installed during July.

Physical Constants Testing Reactor

Assistance to the design and fabrication of the Physical Constants Testing Reactor continued at a constant level during the month. The horizontal control-safety rod and vertical safety disc performance tests have been completed. Calculations for the movable face drive motor, gear reducers, clutches, and shafts have been completed and the components specified. The design of the graphite packing is now complete and the graphite to be used in the reactor has been purchased.

Other Engineering Development Work

Continued assistance was provided during the month to the design of the Discharge Area Viewing Facilities, Budget item B-2116.

The head and control panel for the core boring device have been received from the shops for preliminary testing. Other portions of the equipment are still being fabricated.

Fabrication of the equipment for process tube examination work continued during the month. A special saw is now being designed to aid in the removal of stuck slugs from sections of process tubes.

GRAPHITE STUDIES

Graphite Burnout

Routine monitoring samples were discharged on June 17 from channel 3580-F. The sample chain consisted of four birdcages each containing four graphite samples. Two of the birdcages were exposed in the central portion of the channel and two were exposed in the fringes (front and rear). Weight losses have been measured and indicate an average burnout rate of 2%/1000 days for the centrally exposed large size samples (1.25 inch diameter). An average rate of 40%/1000 days was measured on the small samples (.425 inch diameter). The exposure period was approximately 105 days at a maximum temperature of 480-500 C. A gradient of oxidation was observed within each of the birdcages in that the upstream samples were always oxidized to a greater extent. The difference in the rate of burnout for the two sized samples indicates that the reaction occurs primarily on the physical surface of the graphite. The gradient in the burnout rate as a function of position in the birdcage shows the retardation effect of the increased concentration of the reaction products (presumably CO).

Preliminary data obtained from samples exposed in the inpile heater at F Pile on PT 105-514-E indicate maximum rates of burnout of 43%/1000 days at 650 C or

21%/1000 days at 580 C. Since the temperature history of the samples varied with pile operation after the heater failed, a precise exposure temperature cannot be set. The rates stated above are based on the assumption that the burnout occurred while the samples were above the specified temperature. From the sample temperature recorder, exposure periods of 12 days at 650 C or 25 days at 580 C or above were determinated. Again the gradient of oxidation along the length of the heater is observed. Since burnout rates of equal magnitude were observed for the monitoring samples whose exposure temperature is estimated at not more than 500, and whose exposure period was during the same period of time, interpretation of these data is difficult. The validity of the above measurements is being checked and a review of the gas analysis data is being made to see if the oxidation which occurred can be explained as a result of air leakage into the pile.

The oxidation rates of the burnout samples exposed in the J-N diamond cluster at C Pile under PT 105-536-E have been measured. The samples (four 1.25 inch diameter) were contained in a zirconium birdcage, loaded in channel 2785-C on April 5, 1954 and discharged on May 20, 1954. The samples were positioned adjacent to the graphite thermocouple 59-G-5 which is located in a process tube block. From the daily recordings of the indicated temperature, an exposure period of seven days at a temperature range of 580-600 C and 13 days at 550-570 C was determined. Using these exposure periods, the rate of burnout was calculated and found to be 4%/1000 days for a temperature of 590 C or 1.5%/1000 days at 560 C. The measured oxidation was about 0.03 per cent. Obviously, the rate is subject to interpretation of the exposure period and temperature.

Incidental to this exposure, information on the effect of radiation on zirconium was obtained. It was observed that the zirconium wire was badly oxidized where it had been welded. The wire was brittle and broke easily. Samples have been submitted to personnel of the Metallurgy Unit of Applied Research Sub-Section for testing. A summary of the details of the exposure have been prepared and will be issued soon.

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

On June 18, five more bars were removed from the G test hole of C Pile. Previous attempts to remove these bars had failed because of a poor vacuum system used with the removal equipment. With the use of a new industrial vacuum cleaner obtained from excess stores, the bars were removed rapidly and with a minimum of exposure. However, considerable difficulty was encountered with the operation of the transtacker and with the removal of the innermost shield plug. The latter had been fabricated of mild steel instead of cast iron in an effort to reduce the radiation level. However, the radiation level of the plug was in excess of 700 R/hr. Attempts are now being made to find a more suitable material for this shielding plug.

Neutron purity measurements on these and previously removed bars will be made as soon as possible. These measurements will be followed by laboratory testing for dimensional stability, physical property damage, and oxidation.

Mechanical Strength

A heater for oxidizing test samples has been fabricated and tested. Initial trial runs have shown good control of temperature, gas composition, gas flow and mechanical operation. Oxidation runs are now being made to determine uniformity of test samples and to establish a base procedure for determining the effect of oxidation on graphite strength.

Nuclear Excitation

A study is being made of the energy distribution of bound lattice atoms resulting from pile irradiation. This distribution would be valuable in understanding the kinetics of nuclear annealing phenomena observed in graphite and may well have use in chemical kinetics as well. Two principal sources of excitation of bound atoms are present in the presence of neutron irradiation. The first source consists of direct collisions between the neutron and the carbon atoms during which an energy transfer occurs which is too small to displace the atom, the second source consists of excitation arising along the path of high energy recoil atoms. Preliminary results indicate the first source alone is too small in magnitude to explain the observed rates of nuclear annealing. Consequently a detailed investigation of the second source of excitation is being carried out.

Damaging Flux

In order to develop a satisfactory empirical picture of graphite damage, it is necessary to correlate the damaging flux in various pile exposure positions. Determination of the flux spectra in these positions in turn requires exposure of various flux monitors shielded by boron to absorb the slow flux.

In previous experiments, major difficulties have arisen because the high temperatures generated in the monitor capsules have caused sublimation or distillation of the flux monitors. A new method has been developed to overcome these difficulties. It involves making the monitor capsule from sintered aluminum-boron carbide. The method has the advantage of providing a high thermal conductivity path which should result in lowered temperatures.

Capsules have been prepared for laboratory tests. An optimum capsule should provide:

1. Adequate tensile strength
2. Maximum concentration of boron
3. A high thermal conductivity.

The optimum capsule will be determined from laboratory experiments and utilized in-pile.

Exposures at the MTR

In order to obtain the best use from MTR exposures in piloting future Hanford graphite conditions, it is necessary to gain basic information on expected variations in experimental conditions in the reactor. These include:

1. A knowledge of the damage gradients at constant temperatures in the exposure locations utilized.

2. A knowledge of the degree of temperature control feasible in various exposure facilities.

Information along these lines is being collected. The most convenient constant temperature for obtaining damaged gradients is that of the reactor water. Exposure cans have been designed and are being exposed which allow intimate contact of the graphite with the reactor water. Samples have also been tightly clad in aluminum by a spraying method and are being exposed. Both types of samples should have approximately the same temperature of exposure. Therefore, it should be possible to determine whether graphite damage is effected by contact with water. If the damage is not dependent upon the physical contact with water, it should be possible to obtain damage gradients readily by using this type of exposures facility.

A method is being designed which attempts to control the temperature of samples being exposed in the MTR. Basically, it consists of varying the thermal conductivity by composition, of a He - CO_2 mixture which is passed through an annulus between the graphite sample and the aluminum canned wall in contact with the reactor cooling water.

WATER PLANT DEVELOPMENT

Flow Laboratory Tests

In-pile tests of reduced pH, reduced dichromate, and unfiltered water continued. Current tests are as follows: 2 tubes with process water at pH 7.3 and 0.2 ppm dichromate, 1 tube process water at pH 7.0 and 0.2 ppm, and 2 tubes unfiltered water at pH 7.0 and 5 ppm dichromate. Results of recently discharged tests confirm previous indications of a two-fold reduction in corrosion rates in process water at pH 7.3 with 2.0 ppm dichromate; also, after five months exposure to this water, the tube surface appearance is excellent. After 88 days, slugs exposed to unfiltered water at pH 7.5 with 5.0 ppm dichromate experienced about the same corrosion rates as those occurring in normal process water under similar conditions; again, the tube condition is excellent. Slugs exposed to water at pH 7.3 and 0.2 ppm dichromate for six weeks in the mock-up facilities continued to corrode at rates of one-half or less than would be predicted in process water.

Construction of the 1706-KE Water Studies Semi-Works proceeded. Most of the building concrete work is complete, and overall completion is estimated at 35 per cent.

Plant Tests

Operation of the low pH (7.3) test at F Pile was satisfactory. Because of high alum feed rates, no acid was required during the month; also, because of reduced lime requirements, operation of the low pH side was less expensive than that of the normal side. Inspection of several front tube sections

showed no indication of barnacle formation at the reduced pH. The reduced dichromate test at 100-D is still awaiting a scheduled pile outage.

Operation of the high filter rate test continued at 100-D. Acid addition was initiated to lower the coagulation pH; also, chlorine addition limits were increased. These changes resulted in an increased filter run time to seven hours, as limited by head loss. Operation of the filter plants in range 5.4 - 6.0 gpm/sq.ft. appears definitely practical.

Recirculation Studies

The in-pile recirculation loop at 100-H operated with high purity water at approximately 150 C for ten days. At month's end the system was operating with process water because of difficulties with the electrical overload protection system. Continued delay in procurement of zirconium process tubes has extended the aluminum testing program, probably until October. Modification of the system to increase operational reliability continued.

The 175 C isothermal loop operated about 26 days. Replacement of the ion exchanger cartridge was made to maintain water purity in the one megohm-cm range. Installation of the 1 gpm, 300 C loop was completed except for insulation. The loop has been pressure-tested and operated at low temperature. Procurement of material for two mock-up loops in the 105-F Flow Laboratory is about 20 per cent complete. Bids have been received from three vendors to provide a full scale experimental loop to operate at 600 F; a review and evaluation of the bids is now in progress.

Scope drawings and design criteria for the 1706-KER Recirculation Facility were reviewed and discussed with Design representatives. Discussion centered on the extent to which capacity for boiling studies should be incorporated, and on the methods of providing continued cooling following a power outage or pump failure. Formal comments were issued and forwarded to Design.

Boiling Studies

A test was completed to determine corrosion effects in 20 per cent quality steam at 190 C. After the scheduled twelve weeks' exposure, one of the test slugs had ruptured; another slug exhibited a weight loss of 5.6 grams. This test is now being repeated using 10 per cent quality steam at 190 C and a velocity of 150 fps. A second mock-up tube was discharged after six weeks' exposure to steam-water mixtures ranging from 100 per cent quality, 190 C, at the inlet to 20 per cent quality, 170 C, at the outlet. Weight change measurements are being correlated. The high purity water recirculation boiling loop operated during the month with no slug discharges being made.

A preliminary draft of the production test to authorize in-pile boiling at H loop is being circulated among interested Reactor Section personnel. Data from the 189-D Heat Transfer tube is being applied to establish safe operating conditions for the in-pile test.

PILE COOLANT STUDIES

Production Tests

The two tubes of slugs that had operated with approximately 100 C outlet temperature under PT 105-519-E and which sustained ruptures during April have been weighed and visually inspected. There is an apparent trend which indicates less pitting and less weight loss on the glue-coated slugs than on the ordinary ones. However, the difference is not enough to make this coating of slugs to prevent scratching practical at the present time. Supplement B to the production test has been approved and will be used to determine the value of the coating at temperatures up to 120 C. Two of the four tubes now in C Pile are operating above 110 C.

Tube Examination

Eight pile process tubes were examined during the month. Except for the fact that the first severe ledge-type attack appeared in a C Pile tube, 2382-C, no new or unusual observations were made. Inspection of the 183-DR chemical addition line showed it to be in good condition.

A new type of tube labeling device was successfully tested. This labeler simply rolls a marked tape onto the tube as it is removed from the pile.

Laboratory Corrosion Studies

The Minitube test to determine the effect of water velocity on the corrosion of 2-S aluminum was completed. The data indicate no significant difference in the corrosion rates between 12 and 30 fps. The rate at 45 fps was no more than 10 per cent higher.

The high temperature scale-forming and corrosion properties of two types of water are under study. Three weeks of testing pH 7.3 water at 140 C showed no scale formation. Because some calcium carbonate scale was found to form in the test at 150 C it is estimated that the maximum practical temperature for the use of pH 7.3 water lies in the vicinity of 145 C. Some of the corrosion properties of this water were determined by passing it into a zirconium tube containing both zirconium and aluminum slugs. The zirconium slugs showed no significant weight change. One of them ruptured, presumably because the lead filling expanded enough at 140 C to burst the can. The aluminum slugs showed corrosion rates of 0.37, 0.81, and 2.2 mg/cm^2/day at temperatures of 130, 140, and 150 C, respectively. No pitting occurred on the aluminum slugs even at the points of contact with the zirconium tube. These rates are in agreement with those that have been found for aluminum slugs in aluminum tubes.

The second type of water under study is soft water with sodium dichromate inhibitor. No scale has been observed up to 175 C. The corrosion at 115 C was uniform and not excessive. Considerable pitting was observed at 135 C and above. The cause of this pitting has not yet been determined.

An inexpensive method of producing soft water is being investigated, namely, replacing the anthrafilt of the present filters with a cation exchange material such as Zeo-Karb. An experimental filter containing a 24 inch Zeo-Kar . six

inch sand filter bed yielded zero turbidity softened water for five hours at 6 gal/ft^2/min before the flow diminished. This result compares with a seven hour run in a similar filter using anthrafilt. Equipment is being fabricated and will be used to determine the minimum hardness which is tolerable for scale-free operation at temperatures between 150 and 175 C.

The weighed tube mock-up was discharged after 95 days operation at 95 and 105 C. Weight loss data are being obtained on 2-S, 72-S clad, and 63-S tubes. The Fifty-Tube Mock-up started operation with pH 7.0, 0.1 ppm dichromate water to evaluate the front tube pitting tendency.

A simulated test (alternate filling and emptying) of the corrosion of the 107-K retention tanks was completed. An unsuccessful attempt was made to form a protective layer of calcium carbonate by adjusting the pH. However, the results with the sand-blasted, uncoated surfaces in the control portion of the test confirmed earlier recommendations to leave the tanks uncoated.

SPECIAL IRRADIATIONS

Flow meters and temperature sensing elements for measuring the energy release in a single process channel (HOO-270) have been calibrated. Statistical analyses of calibration data are being made to establish uncertainties. Analytical functions will also be fitted to the data for use in IBM computations of integrated power.

The creep of three stainless steel specimens have been carried to rupture (KAPL-105), completing the seventh in a series of in-pile creep studies. Two more creep assemblies containing nickel and copper respectively have been received from KAPL.

Following repairs to the flowmeter the first of the month, the high pressure, high temperature recirculating loop (KAPL-120) has been operating normally. A second test section, recently received from KAPL, will be charged. The radiation damage at high temperatures to high purity copper, nickel, iron, zirconium, and commercial purity titanium, molybdenum, and 347 stainless steel will be studied through this irradiation.

A preliminary design study of a new high pressure, high temperature loop for KAPL has been made. It has been estimated that this facility will cost approximately $200,000.

Liaison in support of preparation for the irradiation of reactor safety elements (NAA-109) continues. Procurement problems have delayed fabrication of these elements at North American Aviation.

Minor difficulties associated with the MTR fuel testing facility have created a potential delay in the charging of this facility in the MTF on the shutdown of July 7. Efforts are being extended to remove these difficulties before that date.

Equipment is being fabricated for the study of the in-pile reaction of zirconium, zircalloy-2, and aluminum alloys with dry atmospheres of various mixtures of helium, nitrogen, carbon dioxide, and air (HAPO-125). Two annulus tubes will be installed in H Pile for this investigation.

A facility for the exposure of graphite samples at high temperatures (HAPO-128) has been designed. This facility will be of graphite construction; no special heaters will be used. Only pile ambient temperatures will be attainable for exposures.

Design of a new snout facility has been completed; fabrication is in progress. The design basis has been set up for a facility to replace the facility in the E test hole at F Pile. Liaison has been maintained with development of facilities in the K Piles. Considerable difficulty is being experienced in obtaining satisfactory nozzles for these units.

The magazine facility in the D test hole at DR Pile was replaced June 14.

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

TECHNICAL LIAISON

Project Representatives' Activities

Consideration has been given to the advisability of providing for changes in the 190-K high lift pump gears to allow higher flow rates, as part of the 512-R project. A rough schedule of probable water requirements at the K Piles was provided to assist in evaluating this course of action. Difficulties which have been encountered with the faulty secondary pump casings, however, have resulted in considerable uncertainty as to probable water flows and operating philosophy, in general, at least during initial operation.

KE Loop

The criteria and scope drawings for the four high temperature, high pressure recirculation loops planned for KE Pile have been reviewed by appropriate members of Pile Technology. Although not necessary for completion of the criteria, there are three major decisions remaining on this facility. The first of these concerns the possible use of alternate (to stainless steel) materials in one of the loops to determine if some cheaper material may be suitable for such service. The second concerns the choice of pump design and method of providing adequate flow in the event of power failure. It has been tentatively decided that fly wheels would be required to supply energy for shutdown flow. This, in turn, requires mechanical shaft seal pump design. In the interest of keeping leakage during operation to a minimum, Technical has asked that additional consideration be given to the use of accumulators to provide the energy for transition from high pressure to shutdown cooling. This would permit the possible application of canned rotor pump designs which would eliminate the pump leakage problem. The third point which is still under consideration is that of making the loops adaptable to in-pile boiling studies. The original objectives called for provisions wherever possible for later conversion to in-pile boiling, but increased interest in this method of operation has led to the suggestion that at least one or two of the KE loops be made suitable for in-pile boiling as installed. Discussion of this possibility is proceeding.

Amortization Studies

The information which was supplied to appropriate Financial Department people on the life expectancy of the piles and their associated equipment has been under additional discussion. It has been concluded that, in order to adequately answer the question, "What is the physical life of the piles?", it will be necessary to specify a particular philosophy in regard to establishment of operating limits, since the most significant deterioration effect, graphite burnout, may vary over a wide range, depending on how the operating limits are chosen.

Power Recovery

Preliminary process calculations have been made for the case of recovering about 50 MW net electrical power by pressurization of a portion of a K Pile. Equipment requirements and costs for such a pilot plant facility are being estimated.

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

GENERAL ELECTRIC COMPANY

[redacted]

HW-32317

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

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JUNE, 1954

July 8, 1954

SECRET

VISITORS AND TRIPS

R. F. Baddour and R. C. Reid visited here from Massachusetts Institute of Technology, Cambridge, Massachusetts, June 14 and 15, on solvent extraction, ppt methods, fuel fabrication and production site tour.

M. R. Fenske visited here from Pennyslvania State College, June 14 through 18, for process consultations.

T. C. Runion visited here from National Lead Company, Cincinnati, Ohio, June 29 and 30, for consultation on uranium and thorium and attend MDAC Meeting.

D. O. Darby, P. E. Brown, L. H. Chase, M. C. Kelly and D. J. Fisher visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 21 through 23, to discuss in-line instrumentation for process control.

F. W. Woodfield, G. Sege, and E. R. Irish visited Ann Arbor, Michigan, June 21 through 25, to attend AIChE Meeting.

D. M. Robertson visited Minneapolis, Minnesota, June 18 and 19, to attend Analytical Symposium.

R. J. Sloat visited Savannah River Plant, Aiken, South Carolina, June 21 through 23, for process consultations.

A. E. Smith visited Dow Chemical Company, Rocky Flats Plant, Denver, Colorado, June 21 through 25, for neutron counting meeting and process inspection consultations.

M. J. Szulinski visited the Mallinckrodt Chemical, St. Louis, Missouri, June 21, for process discussions for continuous denitration; National Lead Company, Cincinnati, Ohio, June 22 and 23, for process discussions for continuous denitration; Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 23 through 25, for process discussions for continuous denitration; Bowen Engineering, North Branch, New Jersey, June 25, for process discussions; Catalytic Construction, Philadelphia, Pennsylvania, June 28, for process discussions for continuous denitration; Standard Oil Development, Linden, New Jersey, June 29, for process discussions for continuous denitration; and American Platinum Company, Newark, New Jersey and Baker Company, Newark, New Jersey, June 30, for process discussions.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	May	June
Administrative	2	2
Contact - Start-Up Engineering	4	4
Chemical Development	68	70
Plant Processes	49	49
Analytical Laboratories	34	34
Total	158	159

Chemical Development: One engineering assistant was hired for summer employment, one Technical Graduate - Rotational was transferred in from Reactor Operations, two Technical Graduates were promoted to Junior Engineers, one Technical Graduate - Rotational was permanently assigned.

P-10 Process Studies: One Supervisor was transferred to Applied Research.

PUREX DEVELOPMENT

Technical Manual

On June 25 the preparation of the Purex Technical Manual was approximately 37 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 4,820 hours pumping 60 per cent nitric acid at a rate of 8 gal./min. against a 72-foot head. This pump is equipped with CSGBF pile graphite bearings, identical with the material used for bearings in the Purex pumps. No change in the head capacity characteristics has occurred.

Bearing Development - A non-galling hardenable stainless steel, Crucible Steel Co. No. V2B, was believed to have possibilities as a pump bearing. However, corrosion rates in boiling 65 per cent nitric acid were obtained after the V2B had been subjected to a variety of heat treatments, and were found to be high. The lowest corrosion rate obtained was 0.024 in./mo. No bearing studies are contemplated on the material now.

A sintered Type 316 stainless steel bearing impregnated with molybdenum disulfide was tested with a Stellite No. 6 journal. With a clearance of 0.0036 inch and water as the lubricant a high coefficient of friction (0.014 to 0.040) resulted. The bearing did exhibit a good load carrying capacity.

Instrument Development - Interface Control - A letter recommending the use of a capacitance probe, mounted in a side chamber in parallel with the bottom disengaging box, for interface control on the Purex 2A Column was sent to the Design Section. (Reference: R. E. Smith to W. B. Webster, "Purex 2A Column Interface Control Component Specifications," 6/9/54.)

Experimentation on improving capacitance probe design is continuing. A new seal, in which a gasket is an integral part of the Teflon insulation, appears to be superior to the packing gland used in earlier probe designs.

Materials Testing

Nitric Acid Fractionator Corrosion Studies - The construction of a semiworks scale fractionator was completed. The column is 6 inch i.d. and contains 8 single bubble-cap trays. The steam heated reboiler consists of 3 tubes, 1 inch o.d. by 6 feet long. The unit was operated at atmospheric pressure with 60 per cent nitric acid in the reboiler for two periods of 110 and 45 hours, respectively. Corrosion rates of the column components made of Type 304-L, 309-Cb, and 347 stainless steels ranged from 0.001 to 0.01 in./mo.

Irradiation of Kel-F - Seven coupons of Kel-F, the plastic sieve plate and Raschig ring material specified for certain of the Purex Plant pulse columns, were irradiated to selected levels and were subsequently tested in a flexural fatigue tester at a calculated average stress of 600 lb./sq.in. This is at least 20 times as much stress as will be sustained in the Purex columns during plant operation. These tests were designed primarily to investigate the extent to which Kel-F is damaged by beta radiation. Accordingly, the radiation to which the samples were exposed involved a high beta-to-gamma ratio (approximately 4 rads of beta per rad of gamma). Under the severe conditions of this flexural fatigue test (i.e., 20 times the plant stress) preliminary results are set forth below:

Beta Rads	HC Column Plant Oper. Time To Reach Indicated Irrad., Days	HC Column Equiv. Oper. Days Before Flexing Caused Failure
2×10^5	167	No failure after 535 days
2×10^6	1670	220 days

Although these preliminary results would appear, superficially, to indicate a useful life of the Kel-F plates in the HC Column of approximately 2 years even when flexed at 20 times the plant stress, further tests are in progress to delineate the separate effects of beta and gamma irradiation, and to demonstrate the flexural fatigue life at a stress more nearly that to be experienced under plant conditions.

The Kel-F coupons were tested in an Olsen Stiffness Tester to determine the modulus of elasticity and the angle at which deflection ceases to be proportional to the load applied. Irradiation appeared to have little, if any, effect on these properties.

The Kel-F radiation damage investigation is continuing.

REDOX DEVELOPMENT

Process Chemistry

Hydrogen Evolution from Mercury-Catalyzed Dissolving - Twenty-four additional runs were made using jacketed non-irradiated Hanford 4 inch slugs to continue the study of hydrogen evolution during aluminum jacket removal with mercury and HNO_3. Fourteen runs were made in equipment and under operating conditions similar to those reported last month, i.e., no vacuum or air in-leakage to the vessel. Ten more runs were made in equipment operating under simulated plant conditions with air leaking into the dissolver which was maintained under a slight negative pressure. From the data so far obtained the following tentative conclusions have been drawn:

1. Although the occurrence of the hydrogen evolution rate peak may be varied, time-wise, by changing variables affecting reaction rates, and a careful control of rates of catalyst or acid addition may help reduce the magnitudes of the peaks, it does not appear that the formation and evolution of hydrogen can be completely suppressed by the (largely physical) techniques employed so far.

2. Although a few runs have given perhaps acceptably low hydrogen concentrations in the off-gases, none has combined all of the characteristics needed, such as proper final U or HNO_3 concentrations, solution volume, and time cycle.

A few of the more promising runs will be followed through to see if such a combination can be found, but at the same time additional emphasis will be placed on the search for a chemical agent to remove or destroy the nascent hydrogen in solution.

Ruthenium Removal by Intercycle Permanganate Treatment - The laboratory investigation of the feasibility of replacing the permanganate head-end process with an intercycle permanganate treatment during ICU concentration was continued. Arithmetic Ru decontamination factors for the oxidation step ranged from 1.3 to 3.6, with an average of about 2. It was noted that the shorter the time lapse between discharge from the IC Column and the oxidation-concentration step, the better the ruthenium volatilization during this step. Although these recent results are not nearly as encouraging as the preliminary data indicated last month (perhaps due to this aging effect plus other undetermined variables) it does appear that the over-all decontamination for Ru and Zr-Nb will be improved by factors of at least 2 and 4, respectively, if intercycle oxidation is employed.

Tail-End Ozone Treatment of Uranium Product - The effectiveness of Ru removal by ozone sparging through a 4 to 6-foot depth of solution was determined for comparison with the small scale experiments reported last month. An arithmetic Ru decontamination factor of approximately 6 was achieved by a 4 hour sparge with 2 wt. per cent ozone in air at a rate of 1 volume of gas per volume of solution per minute. The solution used was a final Redox Plant uranium product solution (E-12) produced during a period when permanganate head-end treatment was not being used.

Tail-End Ozone Treatment of Plutonium Product - The use of ozone for the removal of ruthenium from the Redox plutonium product (PR) solution, gave an arithmetic Ru decontamination factor of 7.5 following a 12 hour sparge with 2 wt. per cent ozone in air at a sparge rate of 1 volume of gas per solution volume per minute. This result, for a PR solution resulting from Redox Plant operation without permanganate head-end treatment, was greater by almost a factor of 3 than the Ru decontamination factor (2.7) resulting from a similar treatment of a PR solution obtained when permanganate head-end treatment was used. Fourteen hours of sparging were required to reduce the ruthenium content of PR solution with no head-end treatment to the level found in the PR solution resulting from the processing of head-end treated material.

Waste Rework Flowsheet - Laboratory batch studies were made to determine the treatment necessary to permit reworking aqueous salt wastes, when the Redox Plant operates with dichromate feed (IAF) oxidation, and without permanganate head-end treatment. It was demonstrated that such wastes could be blended with feed batches and that the blends should then be oxidized with dichromate at elevated temperatures prior to solvent extraction.

Waste Tank "Bumping" - Previously reported (HW-31757) trends of "bumping" in boiling synthetic Redox neutralized wastes were confirmed under more rigidly controlled conditions. The frequency of pressure fluctuations of four solutions prepared simulating current plant practice and differing only in amount of excess caustic used, have been averaged over a three week period. Pressure fluctuations occurred with the lowest frequency when the excess NaOH over stoichiometric neutrality was approximately 4 per cent.

URANIUM RECOVERY DEVELOPMENT

Process Chemistry

Two Cycle Solvent Extraction Runs - Miniature mixer settler runs have been continued to include feed solutions consisting of current T-Plant (bismuth phosphate process) uranium waste (204 MWD/T) as well as blends of this feed with aged uranium waste approximately 3.5 years old. The data indicate that satisfactory fission product decontamination of current T-Plant waste may be achieved in two cycles, with or without blending with aged uranium waste, only under high acid conditions. However, it appears that blended feeds may be processed utilizing a small increase in the first cycle acidity and a high acid second cycle, thus adding no appreciable cost to the process through increased nitric acid consumption, since the second cycle waste stream is back cycled as scrub solution to the first cycle. The data indicate ruthenium to be the limiting fission product with Zr-Nb contributing little to the final product radioactivity.

MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

Process Studies

Plutonium Isotope Separation - The problems involved in the economically highly desirable objective of substantially increasing pile exposure (MWD/T) levels include the fact that increasing exposures increase the Pu^{240} to Pu^{239} ratio to unfavorable, high values. Thus, separation of plutonium isotopes by solvent extraction, if feasible, could offer great potential economic advantages. Calculations were made to determine the number of theoretical stages and reflux ratios that would be required in such a process under assumed conditions. The calculations indicated that in a solvent extraction process in which the distribution ratios of the two plutonium isotopes differed by an assumed factor (α) of 1.0001 approximately 60,000 theoretical stages would be needed to reduce the Pu^{240} content from the 946 MWD/T level (6.66 per cent) to the 200 MWD/T level (1.80 per cent), with a 1-to-1 Pu^{240} to Pu^{239} ratio in the "waste". Under these conditions the gross plutonium flow rate near the feed point would have to be about 14,000 times the plutonium feed rate. In a process with an α of 1.001, rather than 1.0001, both the required number of stages and the required flow rates would be reduced by a factor of approximately 10. (These calculations are reported in Document HW-32057, "Rough Draft -- Boundary Conditions for Plutonium Isotope Separation by Solvent Extraction," A. M. Platt and D. P. Granquist, June 7, 1954.)

Bipex Process - One possible method of increasing the capacity of H.A.P.O. separations facilities is the Bipex process. The process would employ the BiPO4 Plant dissolvers, extraction cycle, and first decontamination cycle. The uranium bearing waste from the extraction cycle would be transported to the TBP Plant for uranium decontamination and recovery and the plutonium product from the product precipitation step of the first decontamination cycle would be introduced to a solvent extraction battery for plutonium decontamination and recovery. A survey is underway to determine the technical and economic feasibility of the process. Preliminary results indicate that a uranium capacity (at 215 MWD/T) of 180 to 200 tons per BiPO4 Plant per month may be reached by such a combination -- if the four sections made inoperative by the modification are replaced by two new extraction cycles and a new first decontamination cycle.

It is estimated that the capital investment required for the conversion would be on the order of $5,000,000, with the possibility that a firm estimate based on detailed designs would be somewhat lower. Operating cost would be from $5,000 to $6,000 per ton of U processed at a 2256 ton/year rate. In comparison, the cost of conventional TBP-$BiPO_4$ operations range from $8,000 to $9,000 per ton at a 2400 ton/year rate. Thus, potential annual savings of from $5,000,000 to $10,000,000 are indicated with a pay off period of approximately one year, or less. A firm recommendation to go ahead with such a Bipex installation in T Plant, for example, depends on evaluation of the magnitude and duration of the low MWD/T program at Hanford. Since presumably a minimum of 1 1/2 to 2 years would be required for design, fabrication, and installation of the plutonium solvent extraction cycle in or adjacent to T-Plant, a low MWD/T program which is to extend for approximately 3 to 5 years would justify the required Bipex investment. However, for a sustained 215 MWD/T program (greater than 5 years) it would tentatively be economically justified to build a new Purex Plant.

HOT SEMIWORKS

Conversion to Purex

The conversion of the Hot Semiworks facilities to the Purex process is progressing, with all design work complete and the construction work 70 per cent complete. Some equipment testing and tank calibration work will start in "A" Cell next month, although true beneficial occupancy will not be attained until August, when some critical valves and pumps are scheduled to be received.

A portion of the two inch direct buried stainless steel line connecting the Hot Semiworks with Waste Tank Farm C will be installed with a "Somastic" coating to test the feasibility of this method of corrosion control. This coating is an asphaltic protective coating with a mineral and mineral fiber filling, and is being tested under the sponsorship of the Design Section as part of Research and Development Study (RDS) D-14.

URANIUM RECOVERY PROCESS TECHNOLOGY

Tank Farm Activities

Approximately 5540 net gallons of stored waste were removed by water sluicing and direct transfer of supernatant for each ton of uranium removed at the tank farms. The sluice water volume added about 4660 gallons per ton of uranium. Ninety-two per cent of the uranium processed was aged a minimum of 3.4 years since pile discharge after irradiation to an average 338 MWD/T, two per cent was aged a minimum of 2.8 years since pile discharge after irradiation to an average 375 MWD/T and six per cent was aged a minimum of 5.5 years after irradiation to an average of 214 MWD/T. High removal rates were sustained at both BXR and TXR facilities through the use of the continuous sluicing-intermittent blending technique. Of basic importance in estimating future time requirements for completion of removal operations is the observation made at 101-BX that use of water sluicing initially and later application of continuous water sluicing-intermittent blending techniques permitted high removal rates all the way from start to finish with the first major removal rate reduction indicating the tank to be essentially empty. Final cleanout operations were completed expeditiously and 101-BX tank made available for other use

shortly after experiencing the first significant diminution of return per sluicing hour. Thus, if continued high sludge removal rates from start to finish of a tank can be achieved by the water sluicing techniques described, production curtailments expected during cleanout operations may not materialize. Tank farm production curtailments leading to an overall operating time efficiency of about 88 per cent included mainly lack of solvent extraction plant demand and a short lapse in supernatant blending operations at CR owing to temporary depletion of BX--BY supernatant in ready storage (104-C). The UR facility, although operating with high time efficiency, supplied only six per cent of the feed uranium from nearly empty tanks. Five tanks (101-BX, 101-102-103 BY, and 109-U) were released as empty and are available for scheduling as waste receivers.

The solutions received from the tank farms were blended with about 12,250 pounds of 100 per cent nitric acid for each ton of uranium processed, concentrated by about 68 volume per cent boiloff, and supplied, uncentrifuged, at about an average 2.2 M "free" nitric acid in RAF to the solvent extraction batteries. Feed temperatures ranged from 45 to 60 C.

Approximately 4430 gallons of neutralized, concentrated salt waste containing about 1.0 per cent of the new feed uranium were returned to underground storage for each ton of new uranium processed. About 20,470 gallons of low activity waste, containing an additional 0.1 per cent of the new feed uranium were routinely cribbed for each ton of new uranium processed.

Solvent Extraction

The solvent extraction batteries operated at about 85 per cent on-stream time efficiency at an average production rate of ca. 106 per cent of nominal design input. Of the uranium processed 95.2 per cent was shipped to the 224-U Building, 1.0 per cent was sent to stored waste, and the balance was reprocessed by various rework paths. Departures from nominal TBP HW #4 flowsheet conditions included dual-scrub RA Columns, 20 volume per cent TBP in the organic phase, RAIS containing 6 M or 5 M nitric acid vice 4 M "flowsheet" value, RCX heated to 55 ± 5 C and flowing at 55 to 60 per cent of the nominal flowsheet rate, and organic phase washing with three weight per cent sodium carbonate being carried out in the ROO receivers as well as in the RO Columns.

Both RA and RC losses, which averaged 0.7 and 0.1 per cent of the feed uranium, respectively, were erratic and somewhat inconsistent with flow ratios and conditions. High losses of up to 11 per cent in RAW, and 1.5 per cent of the feed uranium in RCW reflected general system instability probably induced through contamination of solvent with some essentially organic soluble foreign compound(s), and in "A" Line additionally through the presence of large volumes of free organic phase in the RAF feed tank.

High gamma values in RCU batches were generally experienced in connection with start-up and shutdown operations. Gamma dF's were not affected significantly by the organic phase contamination and averaged 4.38 giving RCU product at an average 210 per cent of aged natural uranium.

The major process problem, other than high transient waste losses was the effect on 224-U Conversion Plant calcination operations where foaming resulted in serious

production curtailment. As of report time the source of contaminant has not been identified nor isolated but it is believed to be from the aqueous feed or rework system. Rework operations involving recovery of material from Section 5 (Sump Cell) have been suspended. The buildup of free organic phase in the "A" Line RAF tank, observed several times during the past three or four months, may be partially attributed to processing of rework material containing large volumes of organic phase but is probably also due in part to the RA Column overflowing intermittently through its vent.

Solvent Quality

Salient details of the solvent contamination problem are summarized below:

1. Dilute uranium RC E^{o}/a values range up to 0.06 and are not improved as expected by sodium carbonate or caustic washes. Earlier comparable E^{o}/a values (January through April, 1954) were sustained at about 0.005.

2. Uranium removal from RCW gives values in ROO in the range of 2×10^{-4} to 5×10^{-5} lb. U/gal. while earlier comparable values (January through April, 1954), using the same washing system, were generally less than 5×10^{-6} lb. U/gal.

3. Nitric acid in RCU, although generally commensurate with RA Column top scrub section L/V, appears to range somewhat higher than equilibrium considerations would predict.

4. Dispersion time of "poor" solvent is above normal indicating possible presence of lubricants.

5. "Poor" plant solvent (RCW) gives a tight emulsion in an RA-type laboratory contact. This phenomenon when coupled with item 4, above, offers some explanation for observed RA Column instability and high losses.

6. Values for "DBP" in RCU, determined by a qualitative laboratory test known to give accurate results in the presence of known DBP contamination, have been reported as high as 200 parts per million parts of uranium.

7. Reduction of holdup time to minimum values in 221-U and 224-U with operation of the T-B-4 Stripper at optimum V/L ratio has not minimized the foaming tendency of the 224-U calcination pot feeds.

Activities aimed at minimizing the problem in the plant include shortening holdup times, reduction of RAIS nitric acid to 5 M while increasing RA Column water scrub section L/V to at least the flowsheet value of 0.16 to reduce nitric acid concentration in RCU, segregation of rework to "A" Line only while transferring all Section 5 (Sump) materials to waste (if within throwaway limits), additional continuous Tank washing in RCW receivers (similar to ROO receiver washes), and maintenance of maximum feasible stripper steam to feed ratios in 224-U. Laboratory studies are targeted at identification of the offending material(s) and development of a satisfactory solvent cleanup process. The consumption of TBP and diluent was about 22 and 55 gallons per ton of uranium processed, respectively. It is possible, however, that the significant increase in solvent consumption is caused by inventory discrepancies rather than actual losses.

URANIUM CONVERSION PROCESS TECHNOLOGY

An average production rate of 79 per cent of the normal design capacity was maintained in the uranium concentration and conversion facility through this period. Overall production was reduced because of the shut down of the Redox facility and process difficulties in the TBP facility. The product produced consisted of 40 per cent Redox material (E-12) and 60 per cent TBP material (RCU). During this period the large inventory of UNH that had accumulated in the Redox storage tanks has been reduced to less than eight hours production for the conversion facility.

The average quality of the UO_3 powder shipped was as follows: metallic impurities - 153 parts per million parts of uranium, gamma - 87 per cent of aged natural uranium and, plutonium - <5 parts per billion parts of uranium. Two carloads contained gamma activities of 153 per cent of aged natural uranium as determined by the H.A.P.O. method of analysis. Silicon exceeded 100 parts per million parts of uranium in one carload. All carloads were accepted. About 6.5 per cent of the total uranium processed was calcined in gas-fired pots.

Production through this period was hampered severly both by equipment failures and process difficulties. Luckey Pot #20 remained out of service because of no agitator seal. Luckey Pot #19 was operated at only 25 per cent of design capacity due to unloading difficulties, lack of feed, pot sag and agitator failure, and at the close of the report period has developed a leak below the agitator. Process difficulties and equipment failures included failure of the hammer mill necessitating 30 hours of downtime, severe foaming in the pots which increased pot processing time by about 15 per cent, and high radiation levels (as much as 20 rads/hr.) complicating contact maintenance.

Reduction of the air flow by 10 per cent to the blow ring assembly of the dust collection system has reduced overloading the blower. The resulting more constant air flow presents excessive powder buildup in the bags and fewer bag failures have resulted.

Reactivity improvement tests indicated that the addition of sulfamic acid along with reducing the agitator speed produced the most satisfactory product with a minimum of complications.

Inspection of the fume vent lines revealed that severe corrosion had taken place and replacement is required.

REDOX PROCESS TECHNOLOGY

Summary

Six shutdowns were effected during the operating period: (1) to replace the IAF pump, (2) to clear an air bind in the water seal system to the IAF pump, (3) to clear a plug in the interface control line to the IS Column, (4) to clear a plug in the neutralized waste transfer line, (5) to alleviate a flood in the 3D Column, and finally (6) on June 9 to install Phase II equipment. The IA, IS, IC, 2D, 3D and IO Columns, the G-3 Organic Still, G-2 Condenser-Decanter, F-2 ICU Concentrator

and the F-3 Condenser were decontaminated and replaced with the larger Phase II units. The J-5 Vessel Vent Filter was replaced and a J-2 Caustic Scrubber (spare H-5 Ruthenium Scrubber) in series with a new fiberglas filter (J-3) were installed. The J-1 Oxidizer Off-Gas Filter has been isolated and blanked to allow for radioactivity decay before removal.

Process Performance

Equipment failures and operating difficulties during the operating period resulted in inferior decontamination performance and waste losses as indicated in the tabulation below. Of the 26 batches of uranium product transferred from the building, 15 had a gamma ratio above three, and 365 gallons of plutonium product solution required rework. Recovery of plutonium from 231 and 234-5 Building recycle via the Head-End step was discontinued due to the failure of the H-4 Oxidizer coil, but accomplished via recycle to the E-7 Cross-over Oxidizer.

Period covered, June 4 to June 10 processing 82 day "cooled" metal at rates from 3 to 6 tons uranium per day with dichromate oxidation of IAF.

Cycle	Gamma Decontamination Factors (dF)		% to Waste	
	U	Pu	U	Pu
Head-End	0	0	0.03	0.36
First	3.41	-	--	--
Second	2.33	-	--	--
Third	0.69	0.95	--	--
Overall	6.43	6.76	1.58	2.22

The temporary silica-gel beds were regenerated on May 26 and 27 and have subsequently processed 12,500 gallons of 3EU Concentrate. The gamma ratio was reduced from approximately five to approximately three.

Feed Preparation

The dissolvers were charged with uranium having an average pile exposure of 673 (579 to 751) MWD/T. The semi-continuous acid addition technique for dissolving remained essentially unchanged. The scheduling of coating removal and dissolving to minimize the emission of ammonium nitrate from the stack has been continued. The B-3 silver reactor was given a scheduled regeneration on June 6. The C-2 dissolver was flushed with 3.5 per cent HF - 20 per cent HNO_3 solution on June 6 and was then charged with one bucket of slugs having an average exposure of 900 MWD/T. The remainder of a 4.44 ton charge of this material will be added before plant start-up and will constitute the first material processed through the plant. This material is to receive special processing and study to determine its neutron emissivity.

The IAF batches processed from May 26 through June 1 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 with approximately 0.008 M MnO_2 was employed. Recycle solution was added to all feed batches prepared in May, but because of the

failure of the H-4 oxidizer coil, was added to the E-7 cross-over Oxidizer during June. Also, all feed batches subsequent to HE-1 were oxidized in the G-5 Centrifuge Feed Tank by heating at 80 to 100 C using 0.15 M dichromate for 5.5 hours.

Uranium Extraction and Decontamination

Nominal solution compositions of the ORNL June, 1949 (acid deficient) flowsheet were employed for the Uranium Cycles, with the exception that IAF uranium concentration was reduced to 1.7 M UNH, due to H-4 Oxidizer coil failure. To permit operation at increased rates with the dual scrub flowsheet a 2DF composition of 2.70 M UNH, with a freezing point of 30 to 35 C, was employed.

Plutonium Extraction and Decontamination

The Second Cycle flow ratios were varied to handle the addition of 231-234-5 Building Recycle to the 2AF due to the H-4 Oxidizer coil failure. Each volume of recycle solution added was butted with 1.1 volumes of solution containing 2.5 M $Al(NO_3)$ and 0.25 M HNO_3 deficient. On June 6 and 7 the Plutonium cycles were operated at volume velocities corresponding to 13.3 tons per day on the standard flowsheet. No operating difficulties were encountered.

Waste Processing

The Neutralized Waste (D-8) pump became plugged on June 6 but was restored to normal operation with a hot 25 per cent caustic flush.

Temperature traverses of the three-foot diameter test tank located inside the 101-SX tank indicate that the solution in the tank is essentially at the boiling point. The temperature of the solution in the 101-SX proper is about 90 F. The inlet valve to the test tank was closed after the last normal waste batch was processed through the waste cell in order to route all column and tank flushes directly to the 101-SX tank.

Pressure surges in the 101-S tank were noted on six different occasions. These occurred at pressures up to 28 inches of water over periods varying from 20 to 75 minutes.

IN-LINE INSTRUMENTATION

Fabrication of the portable, automatic strip-filter sampler was completed during the report period, and the instrument was delivered to the Redox Plant for service.

All of the electronics equipment and other components necessary to permit the installation of a continuous IBU-2DU gamma monitor at the Redox Plant were assembled, tested, and calibrated during the month. Installation and wiring diagrams were provided for plant operating personnel.

A series of experiments recently completed by Chemistry Unit personnel furnished sufficient data for the design of a uranium monitor (gamma absorption photometer) for UO_3 Plant calcination pot feed. The absorption of 0.66-Mev gamma photons from a Cs^{137} source will be used to measure the uranium content of pot feed flowing in

a two-inch diameter section of the Pot Feed Loop Header. Variations in nitric acid concentration up to 1.5 M are expected to introduce only five per cent error in uranium analyses over a range from 63 to 85 per cent uranyl nitrate.

Investigations during the month have shown that a major cause of TBP-Plant sampler plugging is the presence of extraneous solid matter (teflon gasket chips, etc.) in process vessels. Conventional sampler design incorporates flow passages with diameters as small as 0.116 inch, and solution strainers are not standard equipment. The desirability of design modifications to utilize larger openings and/or strainers for continuous-monitor samplers is apparent.

An RAW polarograph sensing unit of the original design (external D.M.E. mercury reservoir, carbon tetrachloride sump liquid, and no sparger) has rendered continuous satisfactory service since May 28, 1954. The unit has required one routine replacement of the used-mercury sump and one D.M.E. capillary replacement. Redesign of the package-type polarograph sensing devices to produce a composite unit embodying the good features of all previous models is in progress.

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

Isolation Building (Task I)

Type 304 stainless steel filter cloth (20 x 350 twilled Dutch weave) was corrosion tested to determine the suitability of this medium for use in the N-1 filters with no measurable corrosion being detected when a one-inch square sample was immersed in a 70 per cent nitric acid solution for 14 days. However, a 1.55 per cent weight loss resulted when the same sample was immersed for seven days in a 70 per cent nitric acid solution containing 1.0 g/l fluoride-ion. Further testing is in progress under process conditions.

Indications are that the change to 2.5 - 3.5 Kg of distilled water for plutonium(IV) oxalate cake washing caused the average total impurities to increase (1300 ppm to 1700 ppm average) and that the average total impurities have not changed now that sodium dichromate is used for filtrate solution oxalic acid decomposition. Manganese content has decreased slightly but iron is still the principal problem.

Dry Chemistry (Task II)

Based upon fluoride color, 15 per cent of all runs entering Task II required rehydrofluorination. This compares to 11.5 and 6.2 per cent rehydrofluorinations for April and May, respectively. The percentage of pink powders (plutonium(IV) fluoride) obtained in Task II increased from 42 per cent of the total number of runs in May to 55 per cent of the total runs in June. Approximately 35 per cent of the runs for this report period were received at Task II as double batches, two 231 Building nominal batches being filtered onto the same filter boat, this could account for the slight increase of the rehydrofluorination rate, however, sufficient data to verify this has not been accumulated.

Reduction (Task III)

The plutonium yield from the reduction of plutonium fluoride powders in Task III averaged 97.5 per cent. The average yield for April and May was 98.6 per cent, respectively.

Coating (Task VII)

Final Inspection and Quality Control

234-5 DEVELOPMENT

Laboratory-scale precipitation of plutonium(IV) oxalate from Task I-type solutions has shown that agitation with an air lift, as proposed for the new Task I installation, gives satisfactory results.

Manganous ion appears to interfere with the formation of easily-filtered plutonium(IV) oxalate, since strikes from Task I-type solutions which contained 20,000 ppm manganese gave thixotropic precipitates which filtered very slowly.

Dynel and orlon filter cloths were tested and found suitable for the filtration of plutonium(IV) oxalate.

About 500 parts mercury per million parts plutonium were found in two plutonium(IV) oxalate cakes precipitated from Redox PR solutions spiked with 3,000 ppm mercury.

Two plant-scale batches (350 g. each) of calcium plutonium(IV) fluoride were dried in Task II, in an atmosphere of Seaford-grade, water-pumped nitrogen. In each case, a thin layer of green powder formed on top of the filter cake, but the rest of the powder was pink. Both batches could probably have been reduced satisfactorily, but were hydrofluorinated and used as part of the double-salt charge for an attempted 110 model reduction casting. A 96.6 per cent reduction yield was obtained. Purity and 70-58 distribution were satisfactory, but since the metal was not well coagulated on the bottom of the crucible, it was recast to make certain that a sound casting was obtained.

RECUPLEX DEVELOPMENT

Attempts to find a method for the removal of silica from the off-gas system of the slag and crucible dissolver have shown that: 1) heat plus air dry out the silica layer, which then may spall off if thin enough; and 2) direct application of steam to a thin, freshly deposited silica layer may remove the silica.

An investigation of the effect, upon plutonium extraction coefficients, of variations in the composition of Recuplex feeds is underway. A series of nine, batch counter-current runs has been completed, with feeds containing randomized concentrations of nitric and hydrofluoric acids and aluminum and magnesium nitrates. Data obtained from these studies have shown relationships on the extraction of plutonium(IV) which make it possible to make an estimate of the extractability of plutonium(IV) in feeds of varying composition.

Solvent extraction columns and associated equipment, to be used in Recuplex flowsheet studies, are being fabrication and tested. As part of this program, an all-fluorothene metering pump, operated by air and vacuum, has been developed to meter the small flows needed. Initial tests of the pump have been satisfactory and suggest possible application to other service such as the metering or liquid anhydrous HF of the sampling of hot streams.

RECUPLEX CONSTRUCTION

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 45 per cent completed. Installation of the instrument dip-tubes and process piping for the Reception and Blending hood has commenced.

ANALYTICAL LABORATORIES

General Chemical Laboratory

A new horizontal beam General Electric X-ray Photometer has been installed for use in the determination of uranium and thorium. The old vertical model was transferred to the 300 Area Manufacturing Control Laboratory. The new instrument allows a simpler procedure, less possibility of error by the operator and allows some time saving. The versene titration of thorium has been extended to organic solutions. Organic solution samples containing thorium in concentrations greater than 4 g/l can be titrated directly with a precision and accuracy of ± 2 per cent. Lower concentrations of thorium require aqueous extraction prior to titration. The Fisher Nefluorophotometer has been applied to the determination of chloride in colored solution and at the present time 10 micrograms of chloride may be determined with an accuracy of about ± 100 per cent. The Flamephotometer has been applied to two more determinations. Lithium was determined in lithium-magnesium alloy. No interference was noted with a ratio of 9:1 magnesium to lithium. Tributylphosphate in hydrocarbon diluent may be determined rapidly through the use of the Flamephotometer with an accuracy of about ± 2 per cent. Very little ion interference is noted.

Radiochemical Laboratory

Work has been started on uranium assay of unirradiated Lockland fuel elements by chromous sulfate titration. This is preliminary to receipt of irradiated samples for extensive analytical studies. A number of one-gallon pile effluent water samples were analyzed for Zn-65 content. The Zn-65, representing about 10 per cent of the total gamma, was determined by integral counting above 1.0 Mev.

Mass Spectrometry and Water Quality Laboratory

Two shift (Days and Afternoons) seven-days-a-week coverage was resumed in the Mass Spectrometry Laboratory on June 28 in support of the reactivated Mint Program. Work continued on the G.E. Spectrometer in support of the dissolver studies.

Work volume statistics for the Analytical Laboratories are as follows:

	May		June	
	Number of Samples	Number of Det'ns.	Number of Samples	Number of Det'ns.
Research and Development				
Applied Research	1385	2456	1061	2209
Pile Technology	221	1362	266	1351
Fuel Technology	38	756	38	573
Separations Technology	440	799	354	666
Process Assistance	113	1027	265	534
Others	48	202	128	1049
Total	2245	6602	2112	6382

Standards and Calibrations	May	June
Number of standard solutions prepared	39	19
Stock solutions dispensed	56	60
Number of calibrations performed	5	1
Number of calibrated glassware dispensed	0	11
Number of checked glassware dispensed	63	0
Total	163	91

INVENTIONS

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

INVENTOR(S)	TITLE
M. B. Leboeuf F. P. Brauer, Jr.	An instrument system for estimation of maximum plutonium content of containers.

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

July 12, 1954

VRC:bp

GENERAL ELECTRIC COMPANY

HW-32317

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

APPLIED RESEARCH SUB-SECTION

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Applied Research Sub-Section

VISITORS AND BUSINESS TRIPS

D. O. Darby, P. E. Brown, L. H. Chase, and M. T. Kelley, Oak Ridge National Laboratory, visited Hanford June 21-23 to discuss in-line instrumentation for process control.

A. H. Bushey visited at KAPL on June 1-4 to coordinate chemistry research programs.

K. R. Merckx spent June 10-11 at KAPL and General Engineering Laboratory, Schenectady, consulting on stress problems; June 14-16 attending the Second U.S. National Congress of Applied Mechanics at Ann Arbor, Michigan; and June 17-18 attending the annual ASTM meeting in Chicago, Illinois.

M. J. Sanderson spent June 11 at Battelle Memorial Institute, Columbus, Ohio, for consultations on reactor fuel materials.

N. D. Groves spent June 15-16 at Westinghouse Atomic Products Division, Pittsburgh, Pa., where he presented a paper at the AEC Project Corrosion Symposium. He visited the U.S. Steel Company, Pittsburgh on June 14 and the Allegheny Ludlum Steel, Corp., on June 17 to discuss the corrosion resistant alloy development program.

W. J. Ozeroff attended the Reactor Physics Conference at the AEC Idaho Operations Office, June 14-17.

J.C.L. Chatten spent June 15-18 at KAPL consulting on reactor technology.

W. N. Carson, Jr. presented a paper at the American Chemical Society Meeting, Minneapolis, Minnesota, June 18-19.

L. L. Burger attended the Gordon Research Conference at New Hampton, N.H., June 21-26. He visited KAPL on June 28-29 to discuss radiation and separations chemistry and also spent June 30 at Argonne National Laboratory, Lemont, Illinois, discussing separations chemistry.

H. H. Hopkins, Jr. attended the Gordon Research Conference at New Hampton, N.H., June 28-30.

J. L. Daniel visited the Applied Research Laboratories, Glendale, California, June 16-21, for consultation service.

ORGANIZATION AND PERSONNEL

Personnel totals as of June 30 were as follows:	Exempt	Technical Graduates		Non-Exempt	Total
		Permanent	Rotational		
Physics Unit	27	1	1	8	37
Metallurgy Unit	41	0	1	25	67
Chemistry Unit	51	0	2	16	69
Administration	1	0	0	4	5
Total	120	1	4	53	178

Applied Research Sub-Section

PHYSICS

Lattice Physics

Previously reported measurements of the reactivity effect of increased cooling water annuli made for lattices loaded with small diameter (0.925 inches) slugs indicated that reactivity changes did not depend in any simple way on changes in annulus size. Accordingly, empirical measurements are being extended to other slug sizes of interest. Buckling values have been obtained for slugs of standard diameter (1.36 inches) in an increased annulus (3.68 cm^2 of water) as follows, with values in the standard annulus (2.33 cm^2 of water) given for comparison.

Effect of Annulus Size on Buckling, $cm^{-2} \times 10^{-6}$

Lattice Spacing (inches)	Dry Buckling		Wet Buckling	
	Std. Annulus	Increased Annulus	Std. Annulus	Increased Annulus
6-3/16	2	21.3	30	56
7-1/2	101	117	85	86
12-3/8	--	11.7	--	-55.4

Buckling measurements of the 8-3/8" lattice loaded with a combination of J and Q slugs have been completed giving the values 76 x 10^{-6} cm^{-2} for the wet lattice and 144 x 10^{-6} cm^{-2} for the dry. The indicated reactivity gain on loss of cooling water is 68 x 10^{-6} cm^{-2} as compared to the similar quantity for natural uranium slugs which is only 38 x 10^{-6} cm^{-2}. No reason is known at present for the large size of this effect. Thus, the J-Q loading suffers from the serious disadvantage that it significantly increases the hazards of pile operation.

In connection with the development of a cheaper and/or longer-lived fuel element, exploratory calculations are being made of uranium dioxide's neutron properties. Multiplication constants and conversion efficiencies of natural uranium dioxide in the three lattice types of present interest are as follows:

Pile Lattice	Density, g/cm^3 =	Multiplication Factor			Conversion Efficiency		
		9.82	7.09	4.5	9.82	7.09	4.5
H		0.999	0.953	0.878	0.73	0.69	0.66
C		0.961	0.915	0.841	0.72	0.69	0.66
K		0.998	0.956	0.883	0.75	0.71	0.68

The results are given for three possible densities of the dioxide: (a) 9.82, the density of sintered rod, (b) 7.09, the density of compacted powder, and (c) 4.5, the density of tightly packed powder. Some enrichment is needed in each case, more being required for the lower densities. The amounts of enrichment required are currently being estimated. Further, the conversion efficiencies are all lower than for metal slugs. Although the required enrichment will increase conversion somewhat, efficiencies will remain lower than for the metal. Thus, although a reduction in unit cost of plutonium may be achieved by the use of oxide, total production will inevitably be lower for operation at a given power level.

Applied Research Sub-Section

A possible fuel element design for the production of U-233 from thorium was recently suggested involving a 2.7 mil thick Oralloy film surrounding a cylindrical thorium slug. It was pointed out that fission gases might escape from such a thin film and lead to slug instability under irradiation. One possible method of avoiding this trouble is to use an alloy of 30% Oralloy - 70% aluminum in fabricating the film. The thickness of a film of this alloy required to give a usable multiplication factor (k = 1.03) has been calculated to be 42 mils. The conversion efficiency of such an alloy film would be 2% less than that for a pure Oralloy film.

Unlike the plutonium case, the exposure limit for U-233 producing slugs may be determined by U-233 product burnout. Therefore, economically optimum exposures may be as much as 5 to 10 times greater than exposures for plutonium. The problem of the isotopic composition of the fuel at various exposures has been formulated for the Oralloy film type slug and submitted for IBM numerical computation. The U-233 and U-234 contents and the change of lattice reactivity will be calculated as a function of the irradiation time and flux.

The blackness to thermal neutrons is an important property of a slug, basic to calculation of various lattice parameters such as thermal utilization and conversion efficiency. A recently developed method for theoretical calculation of blackness has been applied to uranium-aluminum and lithium-aluminum slugs of various compositions. The results, in the form of curves, are given in documents HW-31475 and HW-31830.

Nuclear Physics

The energy variations of the fission cross-sections of Pu-239 and U-235 are being obtained experimentally by comparison with the 1/v absorption cross-section of boron. The transmission cross-section of U-235, and thereby its absorption cross-section, is being determined simultaneously. These experiments are designed to determine the energy variation of the fission cross-section of Pu-239 and to attempt to improve the precision in the knowledge of $(1 + \alpha)$ for U-235. The energy range to be covered is from 0.020 to 1.0 ev with the addition of a point at 0.005 ev. Preliminary data have been obtained up to 0.1 ev, which will be checked and reported later.

On the basis of a survey of the data bearing on the energy per fission of U-235, it is concluded that the best value is 200 ± 5 Mev per fission. This value is to be used with reference to Hanford-type piles since part of the energy arises from neutron capture gamma rays and therefore varies with pile type.

Irradiation Physics

When an energetic neutron traverses a crystal, its collisions with the nuclei of the crystal causes them to be displaced from their usual lattice sites, thus producing crystal damage. If the neutron energy is low enough, the recoiling nuclei will not be given sufficient energy to cause permanent displacement, but will rather be set into vibration. Such vibrating nuclei will be the centers of expanding elastic waves which, in graphite for example, may constitute an important mechanism in the annealing of crystal damage. These waves and their propagation through the discontinuous crystal medium are being studied in order to determine their effect on annealing.

Applied Research Sub-Section

Plant Physics

A preliminary study has been completed of the critical mass problems which would arise if enriched uranium (up to 1.75% U-235) were to be processed in the chemical separations plants. Detailed consideration of the Purex plant indicated that the dissolvers would provide the most serious hazard.

Actually, none of the Purex plant's major uranium processing components is "always safe" for processing 1.75% U-235; a conclusion unlikely to be changed by further study. However, a different approach to the critical mass problem is suggested by the fact that maximum concentrations planned in the process are all below the chain reacting limit by about a factor of two. Therefore, if adequate control of concentrations and safeguards against precipitation can be guaranteed, a critical mass can be reached only by an unlikely concatenation of circumstances in any part of the plant except the dissolvers.

There appear to be only two possible ways to ensure safety in the case of the dissolvers: (a) the batch size could be limited to less than the critical mass for a particular enrichment (about 750 pounds for 1.75% U 235) or (b) dissolvers of "always safe" diameter could be used (about 15-20 inches in diameter for 1.75% U-235).

The foregoing conclusions are based on the meager critical mass data for low U-235 enrichments obtained at ORNL and BNL. Refined estimates of criticality limits for the dissolvers will require further experimental information.

CHEMISTRY

Purex

Design data for a Purex A column flowsheet operating at 70 C were obtained by batch countercurrent extractions. Variable flow ratios were employed with organic solutions containing 30, 35, or 40% TBP in Ultrasene, and aqueous solutions containing 1.6 or 1.8 M uranium. Four-stage extraction data indicated that satisfactorily low uranium waste losses were obtained when free TBP in the organic phase was maintained at 10% or greater. Similar data are being collected for Pu extractions.

Laboratory pulse column studies were also conducted to test the Purex flowsheet operated at elevated temperatures. As reported previously, the flooding velocity increases with temperature in the range 25-50 C when employing TBP Spray Base as the organic phase and the HW #2 flowsheet. However, an initial set of extractions using TBP-Ultrasene as the organic phase and the HW #3 flowsheet showed a decrease in flooding velocity with temperature over the range 25-70 C; this reverse effect remains to be checked to determine if the change in diluent or the change in flowsheet is responsible. Separate studies show a decrease in both coalescence and dispersion time with temperature when employing either Ultrasene or Spray Base at the higher temperature.

Further studies of the behavior of UX_1 in the Purex flowsheet showed that approximately 80% of the UX_1 entering the 2A column emerges with the plutonium product.

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A decrease in scrub acidity favors elimination of the UX_1 in waste; further tests are planned to find if an optimum acidity exists for elimination of the UX_1 without excessive Pu loss.

Irradiation of pure dry CCl_4 to 10^6 R in the pile basin was found to produce approximately one g/l of chloride, in good agreement with ANL's experience. Similar experiments were carried out to determine decomposition of mixtures of CCl_4 and TBP under irradiations of 10^7 R in the pile basin. Solutions containing pure CCl_4, 25% CCl_4, and 1% CCl_4 produced 2.5, 0.7, and 0.4 g/l choride, respectively. When these data are interpreted in terms of chloride ion produced per 100 ev of energy absorbed by the solution, they reveal an exceptionally high relative chloride production for solutions of low CCl_4 content. Over the same range of CCl_4-TBP mixtures the milligrams of DBP formed per liter of solution increases from about 4000 at 10% TBP to a maximum of 8000 at 60% TBP and then decreases to 4000 in pure TBP.

High chemical stability of the solvent phase was indicated in a system consisting of TBP-Ultrasene versus a high acid, high uranium aqueous solution simulating Purex A column conditions. Batch contacts of non-radioactive solutions at 70° for one hour showed a negligible formation of DBP as indicated by exhaustive stripping.

Uranium Recovery

A series of tests were carried out to determine the uranium transfer rates for various TBP solvents. The transfer rates decreased in the order: crude TBP, pure TBP, unwashed plant solvent, and washed plant solvent, although the differences were minor. A sample of RCW was vacuum distilled and the bottoms were examined with respect to disengaging time. Although the emulsions formed with aqueous systems broke in a reasonable time, appreciable aqueous remained in the organic phase and a film formed at the interface.

Recent difficulties with high waste loss in the TBP Plant and foaming in the UO_3 pots are believed to be associated with the use of solvent recovered from the cell floor and from the feed evaporator. An examination of this solvent showed it to have a relatively high concentration of red oil. A hard cake formed on the bottom of the "lucky" UO_3 pots was observed to be sharply layered into a black and a yellow zone; infrared analysis identified the materials as U_3O_8 and UO_3, respectively.

A sample of UO_3 hydrated according to the Oak Ridge procedure was received on plant site. Upon dehydration the material was shown to have a high chemical reactivity and to yield an infrared absorption pattern identical with the highly reactive oxides formed by flash calcination of UNH or by ignition of uranium peroxide.

A procedure was previously reported which continuously separates uranium and nitrate ions with ion exchange membranes and precipitates UF_4 by electrolysis. Further experimentation shows that uranous ammonium fluoride may also be precipitated at the cathode with equal effectiveness; 74% current efficiency being achieved in a laboratory preparation of two hundred grams of the uranous ammonium salt. However, there were indications of hydroxide precipitation at the cathode and increased resistance in the membrane during the experiment.

Applied Research Sub-Section

Thorex

It was previously noted that thorium is readily oxidized by electrolysis but that the product formed is an insoluble oxide. Attempts to dissolve thorium by electrolysis in sulfate or tartrate medium or by the use of alternating current were unsuccessful. Since it may be necessary to employ fluoride to dissolve thorium, the corrosion problem associated with concentration of fluoride-containing solutions was evaluated. Three types of steel, 309SCb, 347, and 304L, were suspended in boiling solutions that were 0.1 M in HF and 0.1 M in various metal ions to determine if the latter neutralized the corrosive effect of the fluoride. Zirconium was almost completely effective in this respect and thorium, aluminum, vanadium, and titanium were of lesser effectiveness in the order listed.

Ruthenium Studies

A search for methods of minimi. ng ruthenium evolution from the Redox stack included examination of a reverse strike head-end procedure. Simulated dissolver solution was treated with manganous ion, then with permanganate, after which the resulting manganese dioxide suspension was digested and centrifuged. An overall ruthenium DF of 12 was obtained and only 11% of the ruthenium was evolved as gas. A similar treatment of plant 2DF, which has a greatly reduced total ruthenium content, yielded a similar decontamination factor and percentage of gas emission. Examination of additional Redox solutions by chromatographic analyses continues to show ruthenium to be present in different forms in supposedly identical solutions.

Uranium-Zirconium Alloy Dissolution

Laboratory study has been completed of the explosive reaction associated with the treatment of U-Zr alloys with nitric acid. The evidence strongly indicates that UZr_2, separated during the acid treatment, is the explosive component. Two methods for minimizing or eliminating the hazard were defined: (1) addition of fluoride or fluosilicate to the dissolving medium, and (2) conversion of the alloy to the gamma-quenched modification. Detailed observations and conclusions are reported in HW-32365.

Isotope Separations

No positive results are reportable at this time on studies of various methods for effecting plutonium isotopic separations, although progress has been made in several directions. Batch solvent extraction studies with uranium as a stand-in are being conducted; equipment has been constructed to study isotopic separation by thermal diffusion in solution; and various factors involved in the moving thermal zone technique have been evaluated for both uranium nitrate and uranium perchlorate salts. Although homogeneous precipitation was reported to produce a small isotopic separation, a series of successive precipitations shows no further isotopic enrichment. For this reason and because the technique does not lend itself well to process application, further work on this approach has been discontinued.

Applied Research Sub-Section

Pile Problems

Calculations of induced activity were completed and experimental work on neptunium separations was conducted to permit establishment of a detailed experimental procedure for determining the cross-section of Np-239. A sample of uranium highly depleted in 235 will be exposed for 2-3 days in a neutron flux of 5×10^{13} to form 4 curies of Np-239 per gram of U-238. After separation, about two curies of neptunium will be obtained which will be irradiated in the pile for 10 minutes, and then analyzed for its induced Np-240 content by absolute gamma counting. The initial experiment is designed to determine the cross-section with a precision of about ±50%, provided it is in the order of 100 barns, as anticipated.

In-Line Analysis

Considerable progress has been made during the month on the program of in-line analytical monitoring for the Hot Semi-Works. About 80% of the components on order have been received, including the recorders and master programming switches. In addition, shop fabrication has begun on 7 of the 8 operating consoles, and a prototype of this final console is under test. Of the sensing units under study, the 8 photometer prototypes have been tested and final designs are now complete, and tests of the prototype gamma photometer for plutonium determinations are to be continued when the more active thulium source arrives. Shop drawings are 80% complete for the uranium photometer sensing unit although lab tests of the prototype are to continue. The designs of the polarographic uranium and the pH units appear to be satisfactory and drawings are complete for both. A prototype sampling cell and degasser were tested during the month "on the line" in the Hot Semi-Works, and it was learned that foaming of samples, which may occur in some streams, caused failure of the degasser. The redesign of the degasser is complete and preliminary tests are encouraging.

Construction was completed on the light scattering microphotometer designed for use in the 100 Area to determine turbidity of filtered pile water. The unit performed excellently in the laboratory and was delivered to the 100 Area. If no modifications are indicated by plant test, additional units will be constructed to equip each filter plant.

Analytical Development

A rapid flame photometric procedure was established for the determination of total phosphorus. It is capable of determining TBP in the range 0-2% with a precision of ±0.04% absolute and TBP in the range 2-50% with a precision of ±0.2% absolute. Various organic phosphorus compounds were tested and in all cases the recovery of phosphorus was good. The method is applicable either directly, or, if necessary, after a separation for the determination of TBP or its degradation products.

In response to a submitted suggestion, an alternate oxidant to be employed in the determination of total manganese in pile water was tested. The suggested reagent, potassium periodate, was found to be an improvement over that presently used and as a consequence, a modified procedure was drawn up and submitted to the 100 Area laboratory.

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Other analytical research and development work included the chemical analysis of several "J" slugs to standardize the gamma photometric determination for total uranium; the preparation of standard curves for a flame photometric procedure to be used in the clinical laboratory for the determination of sodium, potassium, and calcium in blood serum; and completion of design work on a unit for sampling water from the high pressure loop.

Experiments were carried out in the Applied Research Laboratory to determine the effectiveness of the direct reading Quantometer for uranium isotopic analysis. U-235 in natural uranium was determined with a relative precision of ±1.9%. Several modifications were noted which may improve the precision and Applied Research Laboratory personnel will investigate these. Application of the same technique with Hanford spectrographs yields a much poorer precision and, since no methods for improving this precision are indicated, further work will be discontinued.

The standard sample program continued with the submission of seven standards to various control laboratories and the conduct of 60 separate determinations by these laboratories. Satisfactory results were obtained for the determination of thorium by the x-ray photometer and for the determination of plutonium by alpha counting and coulometric titration.

Waste Disposal and Laboratory Decontamination

One million gallons of "retention" level waste from the Works Laboratory Area were processed to ground. Fifty thousand gallons of "crib" level waste were transported to 200-W cribs for disposal.

More suitable disposal methods for "cut off" boxes from the Radiometallurgy Building were agreed upon in discussion with Radiological Enginering and the Metallurgy Unit. These boxes have an activity level greater than 500 Rads/hr. at 6" and require special handling. There is a need to enclose the unit further before disposal in order to prevent leaching of the highly radioactive material to ground. It was decided to bury several 15-foot lengths of soil pipe (14" diameter) vertically at the 300 North Burial ground and to seal the bottom with cement. The "cut off" boxes will be discarded into these pipes and a wet mix of concrete will be poured into the pipes periodically to encase the units. During the interim period of pipe installation, it became necessary to dispose of one of these "cut off" boxes which was done by concreting the unit in a 55-gallon drum at the burial ground.

Approximately 40 manhours were spent doing special decontamination work in the cubicle room 1F in Building 222-S and transporting special samples from 221-T Building.

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

Applied Research Sub-Section

METALLURGY

Irradiation Effects on Uranium

The decanning of additional preformed specimens, irradiated under PT-105-3N, is continuing. Four of the twelve tensile specimens which were irradiated have broken and cannot be used for tensile tests. Three of the specimens were broken during decanning as a direct result of the bonding between the uranium and the aluminum inserts. Application of colloidal graphite to the aluminum inserts on half of the assemblies proved successful in preventing bonding, and is necessary if the components are to be disassembled after irradiation.

An exposure of 310 MWD/AT for the uranium in PT-105-3N was calculated from the average heat generation of the surrounding uranium tubes and an assumed cosine flux distribution along the tube. This exposure calculation does not take into account the reduction in flux depression due to the small size of the preformed samples which were irradiated. A more accurate value for this depression is being determined by the Physics Unit.

Uranium rods have been received from Welland, Ontario, Canada as a part of the joint U.S. - Canadian Material Stability Program. The objective of this program is to develop methods for fabricating uranium that will produce dimensional stability or controlled deformation during irradiation. X-ray orientation studies made on sections from the ten Canadian-rolled rods indicate that material from their heavy-pass reduction schedule retains a preferred 200 orientation, and therefore will shorten with irradiation. Material from their standard Atlas schedule rolling retains a preferred 020 orientation and, thus, should lengthen with irradiation.

Zirconium Metallurgy

A zirconium wire that was exposed in a dry channel in the C-Pile at about 600 C was compared visually with Zircaloy-2 specimens that had been exposed in the F-Pile at about the same temperature. Although the scaling of the zirconium wire was greater than the scaling of the Zircaloy-2 specimens, in general, the specimens did not scale excessively. However, local areas on the zirconium wire where it had been fusion welded displayed a flaky white scale on the weld deposit and the heat-affected areas. Again, it appears that pile irradiation, if anything, retards the gas reaction with zirconium.

Production Test 105-524-SI, "In-Pile Measurement of Reaction Between Pile Gas Impurities and Proposed Process Tube and Slug Jacket Materials," will be initiated in process tube channel 0776-H on approval of the PT. This process channel has recently been equipped with an inner tube assembly.

A strip of Zircaloy-2 that has grown at an average rate of one percent every 16 hours when exposed to air at 700 C was examined in cross-section; the ratio of the areas of sound oxide to metal was 1:16. Available creep data for Zircaloy-2 was extrapolated to 700 C and it was found that a stress of 1000 to 4000 psi would be required to cause the observed strain rate. If the oxide were causing the strain, then the compressive stress in the oxide must be at least 16,000 to 64,000 psi, depending on the instantaneous ratio of oxide to metal thickness. The literature reports compressive stresses as high as 4000 psi in an iron oxide film; it appears that higher

compressive stresses could be sustained by the mechanically strong and refractory zirconium oxide.

Metallurgical Techniques

An encapsulating procedure is under development for test specimens which are being prepared to determine the effect of pile exposure on the microstructure of uranium. A prototype Zircaloy-2 capsule containing a uranium specimen and liquid NaK was autoclaved and then sectioned. Examination of the capsule components indicated that the technique used for filling, sealing, and welding is satisfactory. A similar capsule, which has been autoclaved for 500 hours at 170 C, will be tested to destruction in an autoclave bomb. An evacuable, inert atmosphere glove box for use in filling and welding capsules is currently being fabricated.

Electron micrographs of Faxfilm-silicon monoxide replicas of cathodically etched uranium wafers have been taken to permit study of inclusions, grain structure, etc. of alpha rolled, beta heat-treated and gamma extruded uranium. The cathodic etching technique is also being used to determine if micro cracks and voids exist in high alpha rolled uranium. In addition, optical and electron microscope studies are being conducted to identify a precipitate tentatively classified as a hydride which forms at grain boundaries on the periphery of slugs during salt bath heat-treatment.

The various steps in the standard electropolish-electroetch procedure for characterizing the inclusion content of uranium metal are being checked in order to determine the conditions which cause attack of the inclusions. Aluminum shadowed replicas of such an electropolished and electroetched uranium specimen have shown that at least 99 percent of the inclusions are attacked at a rate much faster than the matrix uranium.

Fuel Element Studies

The four enriched cored slugs which were charged in the hot spot of C Pile in February have now accumulated an exposure of approximately 1300 MWD/T. Since these slugs are operating at specific powers only slightly below the power generation of the solid enriched pieces which were tested recently, some comparison of performance is justified. The columnar loading of solid enriched slugs reached a maximum exposure of 650 MWD/T at the time slug ruptures required discharging of the material. On the basis that the rupture rate for cleavage failure increases 2.6 times for each 100 MWD/T exposure, it may be stated that if full tube loadings were involved, the probability that the cored slugs would show a lower cleavage failure rate than the solid slugs is now 0.99.

Start-up of the fuel element testing facility at the MTR could not be accomplished during the June 9th shutdown. A combination of small problems in the assembly and MTR operational difficulties made it necessary to delay the start-up.

Evaluation studies of experimentally prepared cold closures formed by upsetting a heavy can wall section have indicated that the quality of the point pressure weld is improved by (1) providing sufficient roughness on the end of the slug to prevent flow of aluminum across the end of the slug and (2) machining a small

recess or dimple at the center of the slug end to allow flashing part of the oxides out of the cap plane. Closures formed on slugs having the recess and the roughened surface have been examined metallographically and etched with 30% sodium hydroxide and appear to be free of oxide stringers throughout the major portion of the cap thickness.

Initial attempts to produce an insulated fuel element in which the uranium surface temperature will be substantially above that of the pile coolant have been unsuccessful. Examination of two hollow uranium slugs which were jacketed in cans which had been anodized on the inside indicated that extrusion of the can wall was greater than had been anticipated, and fragments of the anodized layer were found in the weld area. The extrusion of the can wall also produced severe cracking of the anodized layer.

Laboratory scale investigations have been initiated to develop methods for preparing sintered uranium oxide pieces suitable for reactivity tests and in-pile testing. Two compacts, one of UO_3 and one of UO_2, have been prepared which have densities of 4 gm/cm^3 and 6.4 gm/cm^3, respectively.

The double salt, uranous ammonium fluoride, has been prepared on a laboratory scale for study as a possible starting material for reduction to metal. The material precipitated by ferrous ion reduction of UNH in the presence of ammonium fluoride has a slurry bulk density of about 5 g/cm^3, is readily filtered, and air dries to an easily-handled powder. The double salt $UF_4 \cdot NH_4F$ was converted to finely powdered UF_4 by heating to 375° under a rough vacuum. An attempt will be made to reduce this material if its oxide and residual NH_4F content is found to be suitably low.

An alternate method for producing UF_4 which utilizes UO_2 as a starting material has also been investigated. In this case, the double salt, $UF_4 \cdot NH_4F$, has been produced by the reaction

$$2\ UO_2 + 5NH_4F \cdot HF \longrightarrow 2\ UF_4 \cdot NH_4F + 3\ NH_3 + 4\ H_2O$$

which is extremely rapid at temperatures as low as 50 to 100 C. At 150 C, all the water produced during the formation of the bright green double salt is volatilized and a dry powder product is obtained.

Two reductions of UO_3 to the metal have been made using calcium as reductant and employing a calcium-iodine booster. The booster adds tremendous heat to the charge and also lowers the melting point of the calcium oxide slag. The uranium is formed as a clean dense button which is easily broken from the slag. The slags were then leached with water and acetic acid and the uranium which had not coalesced as a button was recovered as a powder on a sintered glass filter. Using two and two and one-half moles of booster per mole of oxide, button yields obtained were 29 and 34 percent, respectively. However, overall yields for the two reductions were 97 and 94 percent, respectively. Apparently only a few percent of the powder was pyrophoric as the bulk was easily handled in air during the drying operation. Future experiments are planned using calcium and magnesium with a booster for the reduction of both UO_3 and UO_2 to the metal.

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Ruptured Slugs from PT-25M

Four ruptured and two normal slugs were received from production test 25M which was to evaluate uranium slugs machined from salt bath beta heat-treated, Fernald rolled rods. The four ruptures were of the cap failure type. Detailed observations revealed that (1) the three can assemblies which were received were good, (2) the uranium was eccentrically canned(3) the uranium metal was concave at both ends to as much as 0.050 inches, (4) the overall length of the outer periphery of the uranium had increased, and (5) carrot-shaped cavities along the center line of the slug existed from the cap end of the uranium to a depth of over one inch. Metallographic and crystallographic evaluation is now in progress on selected samples from these slugs. In addition, several more slugs representing Hanford re-cast and virgin metal, several types of failures and non-ruptures have been selected for further examination.

Radiometallurgical Examination

As a further validation of the previous metallographic observation that the center of the slug from PT-532-A3 had been irradiated in the beta phase, a hardness survey through a transverse section showed a decrease from 94 to 74 Rockwell G hardness from the edge to center of the section. Normally, sections from irradiated slugs show only about a six point R_G decrease from edge to center.

Irradiated and unirradiated samples of rubber and plastics that are proposed for gasketing in pile use were received and three of the eighty radioactive samples tensile tested. The unirradiated samples had elongation values up to 1000 percent of original gauge lengths and breaking loads of approximately 60 pounds. The irradiated samples broke at loads of approximately 20 pounds and with elongations as much as 750 percent of the original gauge length.

Partial identification of a radioactive contaminant submitted by Radiological Sciences has been made by diffraction analysis. The small size of the specimens which were approximately forty microns in diameter and had a maximum activity of 300 mrad, precluded spectrogoniometer techniques and thus made film methods necessary. For all samples, a darkening of the film occurred before a sufficient number of diffraction lines could appear for complete analysis. Although other material was certainly present, silicon dioxide was the only crystalline material that could be positively identified.

Macroscopic examination of contaminated KEL-F samples received from Separations Technology showed that surface pitting and internal flaws increased with time of exposure in the radioactive test solutions.

Radiometallurgy Facilities and Equipment

A lead partition and a liquid and solid waste collection system were installed in Cell B to facilitate the examination of ruptured slugs. In addition, equipment to remove cap assemblies, to view and photograph slugs, and to improve decontamination procedures was provided. Direct piping of the low level liquid waste into the building crib waste system was sufficiently completed to permit use of the cut-off cell, slug examination cell, and most of the metallographic cell.

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Longitudinal and transverse samples can now be obtained from uranium slugs to evaluate their tensile properties, electrical resistivity, hardness, density, and impact values at selected areas by use of the cut-off box. Rectangular shapes can be cut with dimensions from 1/8-inch to 2-1/2-inch.

A remote operating Rockwell hardness tester was installed, calibrated, and tests begun. The density measuring equipment has been revised to provide accuracy of about 0.001 g/cm^3. The cathodic etching equipment was used to etch polished wafers of unirradiated uranium. Decontamination and sample manipulation problems were evaluated and a proposal for examining irradiated samples made.

Separations Plant Corrosion Problems

Laboratory corrosion tests of types 304L and Carpenter 20 stainless steel and of commercially pure titanium have been continued in both the present Phase I and in the proposed Phase II Redox D-12 Waste Concentrator bottoms. The corrosion rate of 304L stainless steel is excessive in either Phase I or Phase II solutions. However, tests in reduced D-12 solution show that at 120 C type 304L stainless steel is not severely attacked even when exposed for longer than 240 hours. Titanium has shown excellent corrosion resistance to both the Phase I and the Phase II solutions; this is true for both the parent metal and for titanium weld-metal. Titanium samples exposed continuously for 240 hours in Phase I D-12 solution at 166 C also exhibited excellent corrosion resistance.

Corrosion tests on sensitized specimens of type 329 and 312 stainless steels in boiling 65% nitric acid have been completed. Average corrosion rates in the sensitized condition were 0.0005 inches per month for type 329 and 0.0021 inches per month for type 312. However, several fine cracks in the 312 specimen contributed to rather erratic rates. The metallurgical properties of type 312 will require rather careful study to determine the effects of alloy balance, heat treatment, working, etc., on the tendency to crack.

The corrosion rates of 304L and 309SCb stainless steel in boiling nitric acid of various concentrations were found to increase linearally with increasing Cr^{VI} concentration. Although corrosion rates increase with nitric acid concentration in the range 10 to 60% as may be expected, the slope of the rate vs Cr^{VI} concentration is the same for the various nitric acid concentrations. The effect of Cr^{VI} on corrosion rate in 70% aluminum nitrate is in the same direction but of lesser magnitude. The corrosivity of 70% aluminum nitrate containing Cr^{VI} is less than that of 10% nitric acid containing Cr^{VI}.

A field corrosion test of SAE 1020 carbon steel exposed to Redox process waste solution indicates that the extent of pitting attack after an extended exposure of nine months is not serious. The deepest pit observed was approximately 0.003 inches. The uniform corrosion rates show a maximum of 0.00001 inches penetration per month. No cracks were observed either at 2X or at 200X magnification on the single corrosion test specimen which was stressed nearly to the yield point.

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Seven bayonet-type tube bundles have been fabricated on-site for service in the Redox waste concentrator (D-12) and/or oxidizer (H-4). The bundles were fabricated using type 304 stainless steel pierced drawn pipe, thus making it necessary to give the bundles a solution heat treatment followed by a water quench after the tubes had been welded to the tube sheets to prevent intergranular corrosion in the heat affected zones adjacent to the welds. Unfortunately, all the tube bundles suffered severe distortion and warpage from the heat treatment and also exhibited intergranular corrosion attack on some of the tubes adjacent to the tube sheet from the short exposure in pickling solution. Further, the four tube bundles fabricated by Minor Construction which were welded with type 347 rods and electrodes had several cracked welds and many of the metal-arc welds contained slag inclusions and voids. Nearly all the welds of the three tube bundles fabricated by maintenance forces which were welded with type 308L rods and electrodes appeared to be free of any defects. The only exceptions were about ten welds on the face of one tube sheet in which the defects were the result of poor workmanship. It is considered that all of these tube bundles contain defects which may shorten their service life.

The second series of pilot plant heat exchangers are currently being tested in the F4 vessel, 321 Building. These tests are designed to evaluate (1) the relative corrosion resistance of new fabrication materials, (2) the feasibility of various fabricating techniques, and (3) design variables. New materials being tested in this series of heat exchangers are types 312 and 329 stainless steel and titanium. The tests started on June 14, 1954, and should be completed around September 15, 1954.

Apparatus has been built and is being assembled which will measure the corrosion rate of a heat transfer surface as a function of the heat flux through the surface. Determination of corrosion rate as a function of heat flux is necessary in order to evaluate the results obtained on the normal heat transfer equipment where corrosion rate is determined as a function of skin temperature. Calibration runs are being run concurrently to determine the optimum exposure time for valid results on the normal heat transfer equipment.

Specimens of tungsten carbide bearing material, Talide e-93 and 101, were exposed to boiling 65% nitric acid for 144 hours. The corrosion rates of 0.0049 and 0.0042 inches penetration per month, respectively, are excessive, so the tests were terminated. Samples of fused graphite bearing material, Carbolube AP-80 and AP-80-impregnated with antimony, were also subjected to boiling 65% nitric acid. Although the nature of the material precludes weight loss measurements, qualitative examination of the plain Carbolube AP-80 indicates relatively good resistance to boiling 65% nitric acid throughout 240 hours of exposure. The Carbolube AP-80 impregnated with antimony, however, dissolved almost completely within 48 hours of exposure to boiling 65% nitric acid. A long term test of both types was started in 40% nitric acid at 140 F since these are the most corrosive conditions to be encountered in bearing applications in the Purex Process.

Welding Studies

Weldability tests were performed on three high strength low alloy steels which are being considered for materials of construction in replacement downcomers at B and D reactors (program CG-558). The tests indicate that alloys Mayari-R and Yoloy when welded produce ductile joints and the materials are not notch sensitive.

pplied Research Sub-Section

Mayari-R appears to be better than Yoloy, and Cor-Ten appears to be unacceptable as the base material fails in brittle cleavage fracture.

Plutonium Metallurgy

Metallographic examination of a plutonium specimen containing 0.5 weight percent gallium revealed a predominantly delta phase microstructure, with alpha as the second phase. The amount of delta phase present was considerably more than the phase diagram would suggest for an alloy of this composition indicating either non-equilibrium conditions in the alloy or stabilization of the delta phase by unidentified impurities.

Dies for aligning two pieces of uranium during experimental bonding with plutonium under heat and pressure have been designed and are being fabricated. A plutonium pellet will be placed between these uranium bars and pressed either with or without the application of heat. Development of both mechanical and diffusion bonds between uranium and plutonium will be attempted.

Parts of the cathodic etch apparatus have been completed and a D.C. power source for up to 5,000 volts and 20 milliamps has been obtained. Testing of the apparatus will be done when the vacuum system is completed. It is planned to use the unit to prepare surfaces of plutonium for diffusion bonding studies as well as for etching of metallographic specimens.

Preparations were made to furnish ORNL with five circular cylinder test pieces to be used for dissolver studies. Molds are on hand and all equipment is ready to handle the job as soon as final specifications are approved.

More accurate data on the lattice parameters of plutonium metal and its alloys are being sought using routine methods and existing equipment. Curved powder sample holders have been made to provide focusing in selected back reflection regions on the diffractometer. To improve the accuracy of back reflection Laue photographs, tests are being conducted to develop an internal standard consisting of a small amount of sodium chloride cast in plastic. Using the known interplanar spacings of the standard for calibration, errors from uncertainty in film-to-sample distances and from film shrinkage will be minimized.

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 June 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
W. B. Tolley	"A Method for the Reduction of Uranium Trioxide to a Dense Metal Regulus Using the Bomb Technique," HW-32294, 6-30-54.

Signed: F W Albaugh by JTD

Manager - Applied Research
ENGINEERING DEPARTMENT

GENERAL ELECTRIC COMPANY

[redacted]

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

HW-32317

July 6, 1954

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

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

JUNE, 1954

VISITORS AND BUSINESS TRIPS

Name	Date	Address	Purpose
C. E. Bussert J. M. Ciborski	6/15,17/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Metallurgy meeting
H. A. Saller	6/15,17/54	Battelle Memorial Inst., Columbus, O.	Metallurgy meeting
T. C. Evans B. W. Dunnington	6/14,18/54 6/15,17/54	du Pont, Savannah River	Metallurgy meeting
J. C. Woodhouse L. Squires	6/27,30/54 6/29,30/54	du Pont, Wilm.	Metallurgy meeting
A. J. Vander Weyden	6/29,30/54	AEC, Washington	Metallurgy meeting
Winston Davis	6/29,30/54	AEC, S.R.O.O.	Metallurgy meeting
Frank Dowling	6/29,30/54	AEC, O.R.O.O.	Metallurgy meeting
D. Harrington	6/29,30/54	Mallinckrodt Chem. Wks., St. Louis, Mo.	Metallurgy meeting
H. Wunder	6/29,30/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Metallurgy meeting

Name	Date	Place Visited	Purpose
[illegible] F. Sneeberger	6/1,7/54	Nat'l. Lead Co. of Ohio, Cincinnati	Metal Quality Working Committee
[illegible] H. Blasewitz	6/4,15/54	Ames Lab., Ames, Iowa BMI, Columbus, O. KAPL, Schenectady, N. Y.	Fuel Element Development discussions Same as above Same as above
[illegible] E. Taylor	6/8,12/54	Harvey Machine Co. Hunter Douglas Corp. Norris Thermador Co. (all of Los Angeles, Calif.)	Aluminum component fabrication
[illegible] P. Wallace	6/8,12/54	Same as above	Same as above
[illegible]	6/12,18/54	Westinghouse Atomic Power Div., Pittsburgh	Attend Third Annual Corrosion Symposium
[illegible] Wood	6/29-7/16-54	AEC-Washington, D.C. Harwell, England	Obtain briefing for visit to A.E.R.E. Hold technical discussions at Atomic Energy Research Estab.

 Pe-2

GENERAL ELECTRIC COMPANY

Fuel Technology Sub-Section [redacted] HW-32317

ORGANIZATION & PERSONNEL

Personnel totals as of June 30 were as follows:

	Exempt	Technical Graduates Permanent	Technical Graduates Rotational	Non-Exempt	Total
Fuel Assembly Unit	20	--	--	13	33
Fuel Element Development Unit	14	2	1	8	25
Fuel Evaluation Unit	14	--	--	14	28
Coatings & Corrosion Unit	11	1	1	6	19
Testing Methods Unit	8	--	1	2	11
Technical Shops Unit	4	--	--	26	30
Administration	1	--	--	4	5
Totals	72	3	3	73	151

FUEL COMPONENT DEVELOPMENT

URANIUM QUALITY

Twenty-three slugs from three tubes with exposures between 595 and 763 MWD/T were examined to relate plane of warp to the location of the rib marks. Twelve slugs were found with warps ranging from light to medium heavy; eleven of these twelve had the plane of warp perpendicular to the plane intersecting tube marks. The relationship could not be determined for the twelfth warped slug. This is of considerable interest in that it confirms the previously reported observations on 14 warped slugs in which the plane of warp and the tube ribs were similarly related. Furthermore, three of these warped pieces were triple dipped material. A more extensive investigation is planned to determine whether this is a prevalent condition throughout a larger number of slugs. If this should prove to be the case, it will be a strong indication that pile conditions are greatly important in the formation of warp during irradiation.

A progressive downward trend in bare slug reactivity from + .048 to -.019 dih has been observed in the 305 test pile on eight-inch slugs from December, 1953 to June, 1954. Although this decrease in reactivity amounts to only about ten inhours per 105 pile, investigations are being conducted to determine how to arrest and reverse this trend before important amounts of reactivity are lost. Reactivity measurements on stringers of pickle and unpickled hot topped ingot material (IQS-7) show bare slug reactivities of ±.103 and ±.065 dih, respectively. These values for eight-inch slugs indicate that the use of pickled derbies and hot topped seven-inch diameter ingot molds, may provide important increases in reactivity over material received in the past, although this may not be removing the intrinsic cause of the December - June decrease.

Zyglo inspection of slugs from pickled and unpickled derby material (IQS-7) indicates a one per cent and ten per cent reject rate, respectively. Pickle rejection rates of these slugs were approximately one per cent and three per cent for the pickled and unpickled derby material, respectively. Comparative reject rates for standard production slugs for the period June 7 to 18 were approximately 10 per cent by Zyglo and 4.7 per cent by pickle inspection. This preliminary data indicates that the ingot quality studies will lead to cleaner uranium.

URANIUM DEVELOPMENT

Cored Slugs

Two hundred seventy-eight pairs of cored and solid four-inch pieces were lead-dip canned for in-pile testing. As a result of a high rejection rate for defects independent of the uranium, only 100 pairs of slugs were realized. These slugs will be charged in C pile. Woodsplitter tests of cored slugs with a 3/8 inch round hole and with a fluted hole indicate considerable improvement in the number of cycles to failure over solid companion pieces.

Encouraging results were obtained by Bridgeport Brass at Adrian, Michigan in the alpha phase extrusion of uranium into hollow rod sections of both 1/2 and 1/4" I.D. The hole was slightly elliptical and eccentric indicating the need for additional tool development before production of hollow rods with a 1/4" I.D. can be accomplished. Additional tests will be performed in the second week in August.

Fabrication of Uranium

Several types of uranium including seven-inch ingots hot-topped from pickled derby and from unpickled derby, uranium-silicon, -chromium and -titanium alloys and a large size derby were alpha phase extruded into solid rod at Adrian. With the exception of the chromium alloy, all of the billets extruded to rod of good surface quality. The chromium alloy which was inadvertently made with twice the specified chromium content, required a pressure to extrude in excess of that available on the press.

Approximately 3500 uranium powder metal compacts were lead-dip canned. Four tubes containing mixtures of ingot, derby source powder metal compact slugs and standard four-inch lead-dip canned slugs will be irradiated in C pile. Depending on the performance of these slugs, two tubes containing either ingot or derby source powder metal compacts will be irradiated in C pile to determine blister rupture behavior. The balance of the material will be irradiated in F pile.

Uranium Alloys

The uranium-silicon alloy showed encouraging results upon testing in the woodsplitter exhibiting considerable resistance to split-type failure and little dimensional change. Test specimens machined from experimentally rolled uranium - 0.6 atomic per cent titanium alloy showed an increase in ductility of 50 per cent over derby uranium prepared in a similar manner.

CANNING COMPONENTS

The uniskan equipment was completed essentially during this month and is being assembled and readied for trial runs around July 7.

The Components group was assigned the preparation of some 100 fuel elements by cold canning and cold closure techniques for pile tests. Approximately 20 such elements were produced by the method originated by George Last and the examination of closures indicated that they were sound and essentially free of oxide. To simplify the canning and closures, E. A. Smith modified the procedure by using a standard 0.045" wall can and a thick ring for the top cap. Although the final closures are not equal in quality to those produced by the Last technique, results are sufficiently encouraging for further experimentation.

As a result of contacts with potential producers of cups and cans in the Los Angeles area, an experimental order for some 500 thick wall cups is being placed with one of them. These cups will be used for cold canning and uniskanning developments.

In the process tube developments, the first production trials on zircaloy 2 were unsuccessful and additional program is scheduled for August. This schedule may be improved if HAPO makes the new mandrel and perhaps other tooling. This is being considered. Flow laboratory tests are being planned for 63S-72S clad tubes and aluminum powder metallurgy tubes.

Regarding aluminum can quality, arrangements were made with Manufacturing to obtain data on the quality of as-received cans, from which the nature and extent of defects in the cans will be assessed. Also, specimens for corrosion tests have been prepared from high purity aluminum alloys prepared at HAPO. These alloys may prove to be superior to the aluminum in the present production cans.

FUEL ASSEMBLY DEVELOPMENT

CANNING PROCESS

Examination of Lead Dip (PT 313-105-25-M) Ruptures

Seventeen lead dip slugs of PT-25M, including eleven ruptures, were scheduled for examination in the Radiometallurgy facility. Examination of the slug cores from four "cap" failures to date has revealed that the periphery of the slug cores has lengthened and the interior shrunk - resulting in markedly concave end surfaces. As no unusual defects were noted previously in the three slug caps examined, failure initiated by uranium deformation, rather than penetration of defective slug jackets by process water, is strongly indicated at this time. Four eight-inch PT 313-105-3-M slugs irradiated in control tubes have also been scheduled for examination, particularly to determine significant differences in the deformation of the two types of slug cores, those machined from beta treated rod (25-M) and those beta treated following machining (3-M).

Hot Press Canning of "J" Alloy Cores

The Metal Preparation Section will hot press can about 9000 "J" alloy slug cores for the irradiation of thorium early this fall. Production will be started on a small scale basis using Fuel Technology equipment on swing shift; the majority of the slugs will be canned in the 313 Building facilities when completed in the latter part of July. During the initial training period, one-half of the slugs will be canned using the procedures used for production test early this year. The other half will be canned using dip component preparation methods which, if satisfactory, is more amenable to regular manufacturing use than the established scrubbing methods. It is anticipated that sufficient data will become available to make a choice of one component preparation method for the balance of the commitment.

"C" Process Specifications

Formal specifications for the unbonded canning of Li-Al, U-Al, and thorium slug cores have been approved. ("C" Canning Process for the Unbonded Jacketing of Slug Cores," HW-30146).

CANNING DEVELOPMENT

Preparation of hot press canned solid uranium slugs for pile irradiation test has commenced. Completion of the canning is expected about mid-July. The slugs should be charged about the end of the month.

Successful elimination of the blister problem when hot press canning in air has been achieved with improved component matching and improved technique in the sizing operation. In a recent 100 slug test, only three slugs were rejected for blisters.

Evaluation of the solid die process for hot press canning slugs has indicated this to be a feasible technique. Fifty-six slugs so canned all passed the ultrasonic bond test. Chiseling tests to determine bond strength indicate a stronger bond than slugs canned in a split die.

Fourteen, internally-externally cooled, hollow slugs have been hot press canned. The difficulties in initial canning a slug of this configuration have been traceable to improperly machined slugs. Slugs with misaligned or ovate holes cause sizing and pin extraction difficulties. Experience to date indicates that dimensionally correct slugs can readily.

Several glass insulated slugs (to maintain higher uranium temperatures during irradiation) were hot press canned. Evaluation is proceeding.

One hundred fifty-six nickel plated uranium slugs were canned in the four unit gang press during the month including approximately 100 for pile irradiation test. Pressing was carried out using three piece dies, solid dies, and thin sleeve dies inserted in oversize three piece backup dies.

The contract for Phase II (interior construction) of the Fuel Element Pilot Plant (Project CA-546) was awarded to L. H. Hoffman Company at a cost of $460,000. Phase II is scheduled for completion on or about November 5, 1954. Tentative equipment lists were prepared to equip the development and semi-works lines of the Pilot Plant.

FUEL EVALUATION

FUEL ASSESSMENT

Elastic Elongation and Permanent Deformation of Slugs Caused by Induction Heating

It has been hypothesized that the high PT 25-M cap failure rate might be due to properties of the slug core peculiar to uranium which is salt bath beta heat treated in rod form. Two properties which might be significant and could be readily measured were the elastic deformation during the thermal cycling, and the permanent deformation resulting therefrom. Using the 200 KW induction heating equipment, exploratory tests were carried out during the past two months. Elastic elongation and permanent deformation were measured on six, eight-inch canned and stripped slugs including two current production (lead dip), two 25-M (lead dip) Hanford recast cores, and two 19-M (triple dip), and on four PT-3-M type bare slugs (beta transformed as individual slugs). Although small differences in dimensional changes between the pieces were noted, none appeared to be of sufficient magnitude to affect relative in-pile performance.

The elastic elongation during heating for all ten pieces fell in the range of 40 to 80 mils averaging about 60 mils. This value approximates the elongation expected if the piece were uniformly heated to 300 C.

FUEL EXAMINATION

Thirty per cent of the slugs from two control tubes of the lead dip beta heat treated Fernald rods production test (25-M) were found to be warped after exposures over 800 MWD/T. A bulging was noted on some of these pieces and these will be chemically stripped in an effort to evaluate this phenomenon.

It was determined that the gas evolution which has been observed from ruptured J slugs results from fission product gases which have migrated to the slug surface rather than from a corrosion of the piece following water penetration. This was established by the collection of 2 cc of gas (> 95% x e^{133}) from an irradiated J slug after boring two holes through the jacket.

TESTING METHODS

Eddy Current Instruments

Intermittent operation of the MIZ-1 and MIZ-2 instruments was continued during the month. More than 900 production slugs were tested for Al-Si penetration with the first, and only two were rejected. One of these was a 15 mil penetration, the other a badly marred surface. Spurious signal now appears to be almost entirely due to electrical interference. More than 3600 bare slugs which had been passed as free of surface defects in the zyglo inspection were tested with MIZ-2, classified into three groups, and returned to Operations for canning. A sample of this lot is being examined destructively to obtain data comparing the results of the two inspections.

Ultrasonic Bond Test

A report, HW-32186, is being prepared on the development of the ultrasonic bond test. Work in conjunction with the Manufacturing Department, the Project, and Design Sections is in progress to design permanent equipment of this type; meanwhile, a prototype unit is being prepared for use on one finishing line of the expanded 313 production building. It is anticipated that the frost test will be replaced when the designed equipment is ready for installation.

COATINGS AND CORROSION

A preliminary test to determine the effectiveness of the nickel plate as a secondary corrosion barrier was completed. Some uranium slugs were nickel plated, cold sized into defective aluminum cans, and were tested in an autoclave at 170 C. The nickel-plated pieces failed after six hours, while bare uranium canned in the same manner failed after one or two hours. This is still not satisfactory and will be further improved by deposition of thicker or more uniform plates or by appropriate heat-treating procedures.

Some slugs prepared by hot pressing using Iridite coating and graphite as a lubricant were corrosion tested. Some pitting was noted; the cause of this pitting has not been determined, but may be due in part to the R-3 dip. Samples which had not been cleaned with the R-3 dip showed no pitting, but exhibited undesirable corrosion behavior on exposure to pile water in the Flow Cup Laboratory. Electropolishing is being investigated as an alternative cleaning procedure.

Canned slugs which have been anodized by a new improved procedure have resisted attack of pile water at 120 C for over six weeks. The films were still very hard and virtually unattacked. Other samples have been exposed to pile water at 90 C for over three months with little or no attack. A production test to expose some anodized slugs in the pile has been issued; the slugs have been prepared and will be charged during the month.

A contract to prepare a detailed design of an electroplating pilot plant has been negotiated with Udylite Corporation. At present, it is expected that this pilot plant, capable of electroplating 200 to 500 eight-inch slugs per eight hour shift, will be fabricated by October 15.

The procedure for electroplating hollow slugs has been developed to the point where these pieces can be plated routinely in a satisfactory manner. In the laboratory, uranium pieces have been plated with iron, copper or bronze. Wafers which were plated with iron and copper were hot pressed and tested for tensile strength. The results showed that these bonds compared favorably with those obtained with nickel-plated uranium. Both laboratory and pilot plant studies have shown that the current density for the electroplating process may be increased to more than 50 amperes per square foot. This will decrease the time of the plating cycle and will increase production.

Different types of segmented slugs were fabricated by vacuum Al-Si canning techniques. At present, the most promising piece appears to be a slug composed of thin wafers, about 0.125 inches, separated by ~ 0.010 inches of Al-Si. These slugs are being evaluated as to corrosion resistance, ease and economy of fabrication, inhour loss, and other factors. The wafer-type slug can be fabricated easily and may contain up to 90 or 95 per cent as much uranium as is present in a solid slug. From the standpoint of corrosion resistance, economy, and nuclear and physical properties, Al-Si appears to be the most desirable material to use as a matrix.

A design for an insulated slug has been developed, and samples of such a slug have been fabricated. This slug is prepared by winding or weaving a layer of quartz fiber around the uranium and then canning the assembly by sizing or hot pressing. Some difficulty in obtaining a good closure without blistering was experienced in the preliminary trials; but it is expected that with appropriate changes in technique, these difficulties can be obviated.

INVENTIONS

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

GE McCullough

Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

R. B. Clendening of The Bristol Co., Waterbury, Conn., visited Hanford June 2-9 to replace slidewires in all Bristol recorders on plant site.

C. K. Shanks, Pacific Scientific Co., Portland, Ore., visited Hanford June 8 through 30th to make final check on 105-C Gas Analysis equipment for Project CA-431-B.

J. C. McVey, Thomas A. Edison Co., West Orange, N.J., visited Hanford June 22 through 25th to repair 105-K Temperature Monitor primary elements.

W. A. Hartman, H. E. Grantz, D. Eldred and P. D. Bylo of General Electric Co., Schenectady, N.Y. and Gray Clifton, General Electric Co., Pasco, Wash., visited Hanford June 22nd to discuss the design and fabrication of reactor components.

H. S. Davis visited H. A. Whittaker, Standford, Montana on June 7-9th to inspect iron ore deposits and obtain samples.

R. R. Cone visited Advance Electric & Relay Co., Los Angeles, Calif., on June 7-8th to discuss delivery of satisfactory coaxial relays for Project CA-512-R.

L. L. Zahn visited Lummus Corp. and M. W. Kellogg Co., of New York City, N.Y. on June 10-11th relative exploratory engineering for Purex Vacuum Fractionator.

C. A. Mansius visited Bayview Mfg. Co., Seattle, Wash., on June 18 to discuss alternate method of welding venturi insert screens.

C. A. Pursel visited Reed College, Portland, Ore., on June 18-19 to attend American Mathematical Society meeting.

J. S. Carrell attended the semi-annual meeting of ASME at Pittsburgh, Pa., on June 21-24th.

Jack C. Wood visited Pacific Oerlikon Co., Tacoma, Wash., on June 21-24 to test charging machine for Project CA-512-R.

A. J. McCrocklin, Jr., and E. P. Peabody attended the convention of the AIEE at Los Angeles, Calif., on June 21-25th., the latter as a delegate of Richland Section, American Institute of Electrical Engineers.

W. M. Harty delivered a talk at the Nuclear Engineering Congress of the AIChE, Ann Arbor Mich., on June 21-24th.

R. H. Beaton attended the Meeting of Utilities Executives, General Electric, on Association Island, N. Y., on June 25th to 30th.

V. D. Nixon visited KAPL, Schenectady, N.Y., on June 27th to July 12th to inspect West Milton site and reactor.

W. J. Love visited General Metals Co., Oakland, Calif., on June 27-29th. and Bingham Pump Co., Portland, Ore., on June 30th to July 1st to inspect pumps for 100-K Area.

G. L. Locke visited the University of California, Berkeley, Calif., June 29th-July 2nd to attend the Heat Transfer and Fluid Mechanics' Institute.

B. E. Woodward visited Panellit, Inc., Chicago, Ill., on June 29th to July 2nd to make final inspection and observe test of 105-K Temperature Monitor System.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	May 31			June 30		
	Exempt	Non Exempt	Total	Exempt	Non Exempt	Total
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	61	13	74	62	14	76
Design Planning Unit	18	13	31	18	12	30
Design Engineering Sub-Section	84	11	95	82	11	93
Design Drafting Unit	8	91	99	8	92	100
Total Section Personnel	172	129	301	171	130	301
Technical Graduates (Rotational)	-	3	3	-	6	6
TOTAL	172	132	304	171	136	307

Accessions - 7
Separations - 4

GENERAL

Design Section engineering effort for June was distributed approximately as follows:

	Man Months Expended	% of Total
1952 Expansion Program	47.5*	30.4
Reactor Plant Modification for Increased Production	25.1	16.1
Other Projects and Design Orders	27.6	17.7
Research and Development	55.8	35.8
	156.0	100.0

*Equivalent man months expended include 0.9 months of overtime.

Design Section drafting manpower for June was distributed as follows:

	Man Months Expended	% of Total
Design Section	84.8	88.6
Project Section	2.7	2.8
Technical Section	4.1	4.3
Other	4.1	4.3
	95.7	100.0

The drafting production for the month was 287 new drawings, 25 charts and graphs, and 351 revisions. The drafting room average was 4.4 man days per drawing.

DESIGN DEVELOPMENT

Statistics:

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

	Man Months Expended	% of Total
RDS-D-10 Reactor Design Development	9.5	17.0
RDS-D-11 Water Plant Design Development	5.8	10.4
RDS-D-12 Separations Design Development	21.8	39.1
RDS-D-13 Mechanical Design Development	8.7	15.6
RDS-D-14 Utilities and Services Design Development	2.2	3.9
RDS-D-15 Engineering Standards and Materials Development	7.8	14.0
	55.8	100.0

Total research and development costs for FY 1954 are as follows:

RDS-D-10 Reactor Design Development	$ 212,457
RDS-D-11 Water Plant Design Development	111,830
RDS-D-12 Separations Design Development	158,420
RDS-D-13 Mechanical Design Development	200,213
RDS-D-14 Utilities and Services Design Development	32,412
RDS-D-15 Engineering Standards & Materials Development	54,275
TOTAL COSTS	$ 769,607

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

A review of the cost estimate of a 3000 MW dual purpose reactor was made. The estimated total project cost is $188,000,000 which includes transformers, switchyard, and 10 miles of transmission lines in addition to the reactor, water treatment, pumping, and power recovery components.

A document, HW-32150, was issued on the technical and economic comparison of alternate dual-purpose reactor plants to provide a current comparison between the dual purpose reactor plant which was proposed originally and the present basis scope design. Studies on the flexibility of a 3000 MW DPR for increased plutonium production indicate that a practicable 6300 MW power level can be obtained through the addition of heat exchangers for lower influent temperatures (total capital investment required, $5,200,000). Present fuel element limitations would have to be overcome to achieve this level. An economic evaluation of a 2000 MW DPR was started. A study was also started on the economic and physical feasibility of a low-power (1000 MW) graphite moderated reactor capable of power recovery. Preliminary results of a study to investigate recovery of pumping energy by discharging condenser water through a hydraulic turbine indicate a 30% recovery could be effected.

A rough draft of document, HW-32268, "Disaster Safety System for the Hanford Reactors",

was issued and recommended wells as a primary source and any of the existing reservoirs in each area as the secondary source of auxiliary emergency water supply in case of disaster caused by external forces. Study of reactor tube components for single or two phase operation suggests water walls instead of front and rear face crossheaders at high and low power levels. Studies are continuing on evaluating the extent of hazards associated with loss of steam supply to the process pumps when operating at full reactor power.

RDS-D-12 Separations Design Development

Studies were initiated on increased capacity for the Metal Conversion Plant and startup of the B (200-E Area Bismuth Phosphate) Plant in line with recent process requirements. It appears that the B Plant reactivation will require only replacement, repair and testing of equipment. The UO_3 Plant capacity increase will be due at time of B Plant startup.

Study was begun on facilities required for the conversion, recovery, and return of nitric acid to the dissolvers in conjunction with facilities for removing ammonia. The proposed facilities will effectively remove ammonia during the jacket removal cycle and during the dissolving cycle will recover on the range of 85% to 90% of the nitric acid which is normally lost to the atmosphere. Space limitations prevent use of facilities for a greater acid recovery.

A preliminary study of the feasibility of providing a canopy over the crane was completed. The study showed that such a canopy could be provided if it were made of lightweight material. Various designs for temperature indicating probes were studied for use in determining internal cell wall temperatures. The difference in temperature between the cell wall and the incoming air may contribute greatly to abnormal flow of ventilation air and the resultant spread of contamination.

The addition of a second centrifuge in the head end of the Redox process may contribute measurably to capacity increase as well as to minimize plant down-time during centrifuge replacement. Three alternative methods for providing required space were studied. In addition, investigation was continued to determine how a second oxidizer might also be provided along with the second centrifuge.

A study was initiated to provide a method for intercycle steam stripping of solvent from the TBP Plant RC column uranium stream for use after the conversion to series operation. It appears feasible to perform this operation in existing equipment; however, this step may be the bottleneck for the capacity of the building.

Extensive tests were carried out during the month on the Task III furnace valve for the 234-5 Building RM Line. The packing gland and valve stem operation have been redesigned and are now performing satisfactorily. Trouble is still being encountered in developing a satisfactory seal between valve and the furnace top plate.

RDS-D-13 Mechanical Design Development

The development of the prototype fuel element canning machine continued through the month and five uranium slugs were successfully canned in the machine. Evaluation of the fuel elements by the Technical Section indicated fair quality. Further difficulties appeared at various points in the operation of the machine which prevented any sustained canning. Analytical studies of materials, temperatures and times were made to provide quantitativ data for evaluation of problems.

The development of a prototype in-line alpha monitor was continued during the month. A vendor was selected after evaluating bids for fabrication of the prototype. Requisitioning of parts for the installation was completed early in the month. The control circuit and panel arrangement drawings are about 90% complete. Trials of a prototype sample cup punch in the laboratory indicate modifications which will be incorporated in the vendor-fabricated prototype. The Technical Section indicated an active interest in the use of in-line equipment in the Redox Plant.

Design of a new column interface control is complete and all but two special order components for fabrication have arrived. The prototype instrument will be constructed in the laboratory and is scheduled to be completed by August 1, 1954.

An investigation of ultrasonic cleaning techniques as a method of decontaminating perforated dummies in place of the existing chemical bath method was started. Preliminary indications are that ultrasonic cleaning looks very promising as a means of decontaminating perforated dummies.

RDS-D-14 Utilities and Services Design Development

Results of corrosion studies to improve and reduce costs for buried waste lines has centered attention on a relatively new special coating called "Somastic". Arrangements have been completed to test this coating in actual Hanford service and installation of a line will be made in July for conducting waste from the Hot Semiworks to the 241-C Tank Farm.

A final report on the "300 Area Water Supply Study" was issued during the month. The report is favorable to an independent system to replace existing export water supply from the Richland system. This could be done by a well field type development north of the 300 Area and near the Columbia River.

The semi-annual survey was made of all anticipated changes in electrical energy requirements resulting from construction programs or approved design projects. The most significant changes were those in connection with K Plant startup and the shutdown and effects of modification of the reactor areas in the CG-558 Project.

RDS-D-15 Engineering Standards and Materials Development

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

HW-4959-S,	"Standard Specification for Stud Welding"
HWS-5722-S,	"Standard Specification for Railroad Construction"
E-5-15e	"Railroad Gage Rods"
E-5-15f	"Rail Anchors"
E-5-32	"Wood Plank Railroad Crossing"
D-6-162	3-Phase Primary Tangent - St. Ltg. 90° Turn
D-10-2	Single Phase Primary Tangent - Double Crossarm
D-4-15	Guard Arm Assembly
E-5-11	Standard Septic Tank, Rev. 1
E-5-17	Standard Security Chain Link Fence, Rev. 1
E-5-19	Standard Security Chain Link Gate, Rev. 1
HW-4680-S,	"Standard Specification for Chain Link Security Fence, Rev. 1"
D-8-102	One Telephone Cable Tangent, Rev. 1
D-8-103	Two Telephone Cables Tangent, Rev. 1
D-8-108	Telephone Cable Splice Assembly, Rev. 1

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

a. Revisions are being prepared for HW-4798-5 and HW-4799-5, Standard Concrete Specifications. This planned work is now 50% complete.

b. Revisions are being made to DG-100-M "Process and Service Piping" and DG-101-M "Valves and Valve Equipment" in accordance with DG-100-M.

c. Work is being done on developing a design guide for the "Welding of Miscellaneous Metals and Alloys" and is 60% complete.

d. Work on "HW-5766-5, Standard Specification for Radiographic Spot Evaluation of Welded Joints" is 65% complete.

e. Study of compounds used on wood to resist fire continued intermittantly during the month.

DESIGN PROJECTS

Statistics:

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

		Man Months Expended	% of Total
CA-512-R	100-K Reactor	26.3	26.2
CA-512-W	100-K Water Plant	1.6	1.6
CA-513	Purex Separations Facility	9.7	9.7
CA-514	300 Area Expansion	9.1	9.1
CG-551	Expansion of Building 234-5 Facilities	0.8	0.8
CG-558	Reactor Plant Modification	25.1	25.0
CG-574	3X Program - Irradiation	0.4	0.4
CG-578	Effluent Water Monitoring Improvements, 100-B,D,F,DR & H	1.6	1.6
CG-585	Oxidizer Off-Gas Treatment, Redox	1.0	1.0
CG-587	TBP Waste Scavenging	1.5	1.5
CG-588	Ammonia Scrubbers, Redox	0.8	0.8
Major Projects - Other than Above		15.0	15.0
Minor Projects and Design Orders		7.3	7.3
		100.2*	100.0

* Equivalent man months expended reflects 0.9 man months of overtime.

CA-512-R - 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. Scope approval was obtained to utilize a flat screen venturi insert in both the venturis and the double orifice fittings on the "K" Reactor instead of the standard core screen design. The prototype of the CA-512-R charging machine successfully underwent operability testing.

Design was started June 14 on the 1706-KE Recirculation Facilities and is approximately 15% complete. A schedule of design drawings and material and equipment lists were prepared during the month. The Design Criteria and sixteen scope drawings have been issued for comment. Design scope is essentially complete.

CA-513 Purex Separations Facility

The design of revisions to the condenser design for the Purex Tank Farm was continued during the month. The first phase entails revising existing contract drawings as required to eliminate the surface condenser installation from the contract. Four new drawings and a drawing schedule were issued for this phase and design is approximately 99% complete. Phase II includes material procurement for the contact condenser installation. One purchase specification was prepared and issued for comments. Phase III entails the preparation of new construction drawings and specifications for the contact condenser installation. A drawing schedule was issued for this work and design is approximately 20% complete, an increase of 17% during the month.

A project proposal was started and completed, except for signatures, for the design and construction of the Purex nitric acid, vacuum fractionator facilities. Two engineering firms were contacted for purposes of preliminary exploration with regard to selection of a suitable "design and fabrication firm". It is intended that the design and fabrication of major equipment be awarded to a single vendor to minimize past problems of co-ordinatin design and fabrication and to benefit from past experience with similar equipment.

A report on the best means for burial of failed Purex equipment was completed. Three scope design drawings were prepared and design is approximately 95% complete.

CA-514 - 300 Area Expansion

Additional work was received for the 300 Area Expansion Program. This work consisted of modifications to the monorail system and design of a battery storage rack in the 303-K Building, and design of ultrasonic bond test equipment which will partially replace the frost test now in use. This additional work reduced the over-all design completion percentage from approximately 96% to 92%. Design of the 313 Building structure and equipment is approximately 99% complete. Work remains on water autoclaving instrumentation, the canning line transfer table design and the diversey drum handling device. A total of 42 acceptance test procedures have been issued for approval, 16 issued for comment and five remain to be written.

The scope drawing on the conversion of the 3706 Building to office space is complete. Preliminary equipment layouts in the first aid and patrol areas of the building were issued for comment. This design is approximately 10% complete.

CG-535 Redox Capacity Increase, Phase II

Final design of Redox Capacity Increase, Phase II, is 97% complete, an increase of 1% during the month. One drawing was completed and approved during the month. Effort was concentrated on the checking and revising of prints for the expansion installation which is in progress.

CA-539 Redox 241-SX Tank Farm

Overall design for the 241-SX Tank Farm is approximately 99% complete. All drawings required for manifold condenser installation have been completed.

CG-549 Activate Task I, Building 234-5

Scope of the Activation of Task I, Building 234-5 was changed to incorporate the reactor sparging system which replaces the previously designed agitator. Approximately 24 drawings require redrawing or revision at a cost of $3,000. Overall design work is 99% complete.

CG-551 Expansion of Building 234-5 Facilities

Design work on the expansion of Building 234-5 Facilities is 100% complete as of June 15, 1954, an increase of 0.5% during the month. Acceptance test procedures were completed, approved and transmitted to the Project Section for issue to the field. This completes design activity except for design field liaison and mock-up and testing of RM Line components.

CG-558 Reactor Plant Modification for Increased Production

Overall design on Reactor Plant Modification for Increased Production was advanced to 26.3% complete, an increase of 8% during the month. Detail design is 20% complete, an advance of 8% during the month while scope design is 67% complete. These figures do not reflect changes imposed by the directive as noted below.

Authorization of Project CG-558 totaling $26,800,000 was received from the AEC. The directive included authorization to provide design for maximum process water flow at F and H Reactors instead of intermediate flows. A revised project proposal incorporating the changes imposed by the directive, as well as establishing new cost estimates and schedules, is being prepared.

The Design Criteria for the 100-B Area was design approved. The drawing schedule is being revised to include work as specified for the 100-F and 100-H Areas to agree with the scope as outlined in the directive. Thirty-five drawings and four specifications have been issued for approval and 135 drawings and seven specifications have been issued for comments.

Design for the 181 Buildings, the 183 Buildings, the 190 Buildings, the 105 Buildings, the effluent systems and electrical substation was continued for the 100-B, D, and DR Areas. Investigation is being made of the feasibility of utilizing present 20 inch valves and checks instead of installing new 24 inch valves in the 181-D Building. This might effect a construction cost savings of approximately $35,000.

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

Design of the Effluent Water Monitoring Improvements, 100-B, D, DR, F and H Areas was advanced 6% during the month to 14% complete. Purchase requisitions for the turret drive mechanisms, the turrets, the gamma ray spectrometers and the recorders were issued during the month. Six drawings were approved, four drawings are issued for formal comment and four drawings are in the check print stage.

CG-585 Oxidizer Off-Gas Treatment, Redox

Design of oxidizer off-gas treatment equipment is 77% complete, an advance of 2% during the month. One drawing was completed and approved during the month making a total of 15 out of 25 drawings which have been approved.

CG-587 TBP Waste Scavenging

The preparation of the project proposal for the TBP Waste Scavenging was completed, approved and transmitted to the HOO-AEC. Design work was started early in June and approximately 12 drawings will be required. Four drawings were issued for comment and three were ready for comment by the end of the month. Overall design work is 45% complete.

CG-588 Ammonia Scrubbers, Redox

Design for the Redox ammonia scrubbers is 15% complete. Approximately 20 drawings will be required, of which three drawings were ready for comment by the end of the month.

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

Design on the Redox Back-Cycle was advanced 10% during the month to 68% complete. One drawing was completed for approval during the month.

D.O. 100689 - High Speed Electric Transcriber (CG-553)

A second set of approval prints were received from the Fischer and Porter Company. After inspection and approval, the prints were returned with a letter of recommendation.

D.O. 100718 - Installation of Foxboro Dewcells in Gas Systems - 100 Areas

Design was continued and one drawing was issued for comment. Purchase requisitions are being written and an arrangement drawing was started.

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

The electrical portion of the Modification to the 314 Building was advanced to 90% complete.

D.O. 100750 - Project Proposal - Modification 100-C Reactor Plant

The project proposal for modification of the 100-C Reactor Plant did not meet with the approval of the Manufacturing Department as written. Discussions and re-examination of the justification were started.

D.O. 100752 - FY 1955 and 1956 Plant and Equipment Budget

A new data sheet on Reactor Safeguard was prepared and discussions were held with the Financial Department regarding the AEC submission of the budget.

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 10% during the month to 50% complete. Late in the month, information from a vendor regarding performance tests on their pumps upset the anticipated heat balance for the test loop and required radical changes in the design and layout of the loop together with procurement of entirely different equipment.

D.O. 100755 - Hot Semiworks Purex Self Concentrating Waste Storage Prototype (CA-513-D)

Design work on a self-concentrator tank and associated piping and accessories for the Hot Semiworks is 100% complete, an advance of 20% during the month. The twenty-three drawings required for this project have been approved and issued.

D.O. 100756 - Fuel Element Pilot Plant Hoods

Design of equipment exhaust hoods for the fuel element pilot plant was advanced 40% during the month to 60% complete. Two drawings were issued for comment and four drawings were ready for checking.

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

Drafting is continuing on the revision of Hanford project maps to bring them up to date and is approximately 30% complete, an advance of 10% during the month. Of the 31 electrical drawings which have been started, 17 have been approved; work on 115 civil maps has started.

D.O. 100778 - Physical Constants Testing Reactor-Graphite Component Design (CA-566)

Detail design of the graphite components for the Prototype Physical Constants Test Reactor is 100% complete, an advance of 5% during the month. Remaining work consists of design liaison during graphite machining and initial stacking phases.

D.O. 100781 - Scope Design for Replacement of UO_3 Nitric Acid Fractionator

A recommendation report is in the rough draft stage concerning a proposed method of using absorption in the UO_3 Plant instead of the acid fractionator. The proposed absorption method eliminates the need of a new vacuum fractionator, barometric condenser, auxiliary tankage and piping, and should afford substantial savings in operating and maintenance costs.

D.O. 100791 - Modification to 115-B Building for C Area Gas Supply (CA-431-B)

Design of the modifications to the 115-B Building to provide adequate flows to the 100-C Area is 100% complete, an advance of 25% during the month. A total of five new drawings were made and seven drawings were revised.

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

Design on the Redox Silica Gel Tail-End Treatment Facility was advanced 15% during the month to 25% complete. Of the 22 drawings required, ten have been issued for comment and five others are in drafting.

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

Design on the alterations to the 1705-F Building was advanced 5% during the month to 80% complete. All drawings have been issued for comment.

D.O. 100843 - Central Mask Washing Station

The project proposal has been written and is awaiting approval of the Manufacturing Department. Indications are that deletion of the 100-300 Areas from the scope may be desired.

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

Design of the general improvements to the Laboratory Area Buildings was advanced 3% during the month to 95% complete.

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 submitted to the HOO-AEC for their review and authorization.

D.O. 100851 - Metal Loaders - Reactor Charge Elevators

The project proposal for a metal loading facility for the charge elevators in the 100-B, D, F, DR and H was sent out for approval. The Manufacturing Department has delayed approval pending study of the effects of charge-discharge operation. As a result, examination of the justification was re-opened by the Manufacturing Department.

D.O. 100860 - Structural Check on Floor - 325 Building

Structural analysis of the floor of the 325 Building is approximately 85% complete.

D.O. 100879 - Ammonia Scrubber, Redox

A project proposal for the Redox Ammonia Scrubber was completed and transmitted to the HOO-AEC.

D.O. 100884 - Third Charging Machine

A project proposal was prepared for the installation of a third charging machine and a draft was sent to the Manufacturing Department. Further work was stopped pending comments and charge-discharge considerations.

D.O. 100887 - Redox Production Facilities (CA-187-D-III)

Design of an additional crib for the Redox production facilities was advanced to 97% complete during the month. Five drawings have been approved and remaining work consists of writing two purchase orders.

D.O. 100888 - Mobile Environmental Monitoring Laboratory

Comments were received on a preliminary drawing for a mobile laboratory for environmental monitoring.

D.O. 100889 - Records Storage Facility - 2101 Building

Work was started on a project proposal for a records storage facility in the 2101 Building. A review was made of the requirements of the Uniform Building Code for records storage.

D.O. 100893 - Redox Viewing Room

Design was started on a Redox viewing room for viewing canyon operations and the work is approximately 80% complete.

D.O. 100908 - Slug Dimensioner and Fracture Displacement Indicator

Preliminary design studies were started for a slug dimensioner and fracture displacement indicator and the work is approximately 90% complete.

D.O. 100925 - Reactivation of Facilities - CG-550

Design was started on the conversion of drawings to the as-built status and 35 out of 85 drawings are complete.

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

Design was started at the end of the month on the modification and enlargement of Building 3730 as a hot shop for experimental work on graphite. Detail design is scheduled to start July 1, 1954 and be completed about October 1, 1954.

DESIGN SECTION WORK COMPLETED DURING JUNE

D.O. 100570 - Revise Area Map 200-W
D.O. 100735 - Laboratory Supply Space
D.O. 100742 - Electro-Mechanical Counter System
D.O. 100799 - Coal Trestle Analysis - 1100 Area
D.O. 100803 - Redox Replacement Jet Drawings
D.O. 100806 - 277 S and U Shop Ventilation
D.O. 100824 - Revised Drawings for Agitators
D.O. 100859 - As-Built Drawings 105-B,D,F, DR and H
D.O. 100866 - Hanford Slave Manipulator
D.O. 100885 - Instrumentation for K-Tube, Washout Tests
D.O. 100886 - Design Assistance - Fuel Element Development
D.O. 100903 - Technical Manual Sketches
D.O. 100904 - Drop Leg Jumpers, Cell 12, 221-T Bldg.
D.O. 100906 - Seven Jumpers, Section 10, 221-T Bldg.
D.O. 100907 - Diversion Box Jumper
D.O. 100910 - Jumpers 001 WR to 003 WR and 241 UX Diversion Box
D.O. 100911 - Jumper L-18 to L-20 in 155-TX Diversion Box
D.O. 100912 - "J" Tube Sampler - 271-U Bldg., 200-W
D.O. 100913 - Sewage Pump at 141-F Bldg.
D.O. 100915 - "As-Builts" for Groves Valves, 105 Bldg.
D.O. 100917 - Loading and Unloading Head - 231 Type
D.O. 100918 - Flexible Bellows Spool
D.O. 100919 - ½" Air Jet Exhauster, 200 Area
D.O. 100920 - H-4 Pot Covers, 202-S Bldg.
D.O. 100945 - Redox Stack Cleaning

INVENTIONS

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

Manager, Design
ENGINEERING DEPARTMENT

DESIGN SECTION WORK STATUS

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	Shed. FY 55 July	Aug.	Sept.	Oct.	Nov.	Dec.	Sked. Bal FY 55	Total FY 55
CA-512	111.6		12.0	19.5	99.6	12	12	13	12	11	10	29.6	99.6
CA-513	10.7		2.6	4.2	8.1	2	2	1	1	-	-	2.1	8.1
CG-558	35.8		4.2	6.8	31.6	5	4	4	4	4	3	7.6	31.6
R&D Program *	*		39.9	64.7	600	39	39	39	40	42	43	358.0	600.
Other Major Proj.) Minor Proj. & D.O's.)	39.0		3.0	4.8	36	3	3	3	3	3	3	18.0	36.0
Anticipated Future						1	2	2	3	3	4	123	138.0
TOTALS	197.1		61.7	100	775.3	62	62	62	63	63	63	538.3	913.3

DESIGN ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS

CA-512	104.9	33	12.9	16.4	125.0	12	13	14	15	15	14	42.0	125.0
CA-513	22.0	10.0	6.0	7.7	26.0	6	7	6	3	1	1	2.0	26.0
CA-514	21.5	2.0	8.8	11.2	14.7	6	4	2	1	1	-	.7	14.7
CG-558	265.5		18.9	24.1	246.6	19	20	22	23	24	23	115.6	246.6
CG-578 & 579	22.6		1.8	2.3	20.8	3	3	3	3	3	2	3.8	20.8
CG-587	6.0		1.2	1.5	4.8	2	1	-	-	-	-	1.8	4.8
CG-588	6.0		0.6	0.8	5.4	3	2	-	-	-	-	.4	5.4
Other Major Projects	84.0		12.3	15.6	71.7	12	10	9	8	7	7	18.7	71.7
Minor Proj. & D.O's.	*		5.5	7.0	60.0	5	5	6	6	6	6	26	60
RDS Program *	*		10.5	13.4	210	11	11	13	14	14	15	132	210
Ant.Fut.(Major)							2	4	7	9	12	247	281
TOTALS	532.5	45	78.5	100	785.0	79	78	79	80	80	80	590.0	1066.0
* New FY Totals													

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects FY 55	Anticipated Future FY 55	Totals
Arch. & Civil	149	59	208
Mechanical	202	74	276
Electrical	185	64	249
Instrument	173	60	233
Standards	76	24	100
TOTALS	785	281**	1066.0

**Total reduced from previous month as RDS total shifts from Anticipated Future to Scheduled Work.

DECLASSIFIED

Ef-14

MONTHLY NARRATIVE REPORT - JUNE 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Effective June 28, 1954, C. F. Quackenbush was assigned as Acting Head, Water Plant Unit, to replace D. J. Quigley who was transferred to G.E. Realty Corporation. Following is a summary of personnel changes in Project Section during the month:

	May 31, 1954	June 30, 1954	Net Change
Employees on Payroll	437	428	-9
Tech. Grad. - Rotational	11	13	+2

The end-of-month status involved these changes:

	Project Section Personnel	Tech. Grad. - Rotational
Payroll Additions	5	
Payroll Removals	9	
Transfers into Section	6	2
Transfers from Section	11	
Transfers within Section	6	

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	51%	50%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	94
	Reactor & Bldg.	100	87
	KE - Water Plant	93	77.8
	Reactor & Bldg.	70	71.7
	General Facilities	92	85.5
CA-513	Purex Facility, Part "A"	54	48.6
	Part "D"	53	60
CA-514	300 Area Expansion	50	40
CG-535	Redox Capacity Increase, Phase II	70	64
CA-539	Redox 241-SX Tank Farm	99	99.5
CA-546	Fuel Element Pilot Plant	25	13
CG-573	Hanford 3X Program - 300 Area	89	93

C. CRAFT LABOR

The charge of unfair labor practice filed by Cisco Construction Company against the Pasco Building Trades Council was heard on June 11 by the National Labor Relations Board. Cisco has been allowed to resume work in 200-West and 100-K Areas; however, the work to be performed in 100-K by its non-union electrical subcontractor has been deleted from the contract.

On June 24, 25, and 26 an arbitrator heard the question of retroactive isolation pay for construction bus drivers. No decision has been announced.

Jurisdictional disputes delayed construction as follows: instrument pipefitters and electricians have disputed installation of panel boards in 202-A Building, and the panels have been locked up; pipefitters and millwrights have disputed installation of horizontal rod hose reels in 105-KW.

Pipefitters have refused to install piping for the vertical rod exhaust cylinders. They contended that A.E.C. had agreed to on-site fabrication of all piping under two inches. The labor relations manager for the construction contractor has gone to Portland, Oregon, to confer on the problem.

D. SAFETY AND SECURITY

There were nine regular meetings of safety, security and health topics which were attended by about 310 personnel. Four regular Monday "tool box" meetings were conducted in the field. Seven Special Hazards meetings were held, and Special Hazards Disclosure and Orientation was given to 98 service contractor employees before assignment to SWP work. On June 25, 1954, Minor Construction service forces completed 1,000,000 man-hours over a 14-month period without major injury.

E. HIGHLIGHTS

Minor Projects Sub-Section

Work was done on 40 project items, two informal requests, and miscellaneous work orders, representing total authorized funds of $39,799,168. The Sub-Section completed assigned work on the following: CA-192, Remodeling 108-F Building for Biology Laboratory; CG-511, Completion of Minor Construction Fabricating Shops; CG-550, Reactivation of Facilities; and CG-564, Additional Ball 3X Equipment - 105-C Building. Nine project proposals were approved by General Electric Company. Five authorizations were granted by A.E.C. The Sub-Section accepted initial assignment of work on three projects, one informal request, and two engineering requests. Important projects now in progress include Recuplex Installation, 300 Area Production Facitilies, Fuel Element Pilot Plant, Hot Semiworks Conversion, Hanford 3X Program - 300 Area, and Reactor Plant Modification for Increased Production.

Project Auxiliaries Sub-Section

Inspection was completed on 79 orders; 153 new orders which will require inspection were received. At the end of the month there were 1279 current orders for items

which require inspection. Studies of new castings for 100-K Area process water pumps were continued. Reproduction output was 531,005 square feet for the 24 working days of the period. Estimating completed 22 estimates, including those for 12 project proposals. Field Surveys completed surveys for the new settlement basin in North Richland, and other work orders for tests.

Reactor Projects Sub-Section

Remaining graphite was prepared for storage; and all rejected material, about 250 tons, was returned to National Carbon Company. At 105-KW Reactor, vertical safety rods were installed, and about 75% of the VSR cylinders were set. Horizontal control rods are being set and aligned. Front face crossheaders are being tested hydrostatically. Three primary pumps at 190-KW have been completed with new bowls. None of the secondary pumps have been satisfactory.

Boiler #1 in 165-KW was fired and is being run on a preliminary basis. Other installations at 165-KW were continued. Five pumps and three ball valves at 181-KW were in operating condition. At 105-KE Reactor, the preliminary air test was begun on June 22. "Vanstoning" of process tubes was about 70% complete, and is awaiting completion of unit air test. The first rear face riser was set at 105-KE, and outlet crossheaders are being shipped to 105-KE Building. In 100-KE Water Plant, progress consisted of setting secondary pump drives, boilers, turbines, and switchgear. Construction was estimated as about three months behind the 100-KW Water Plant.

Separations Projects Sub-Section

Concrete block work at the east end of 202-A Building was finished, thus completing enclosure of the Canyon Section. Overall completion of concrete for 202-A was 97%, and the built-up roofing was essentially completed. In the cell walls, installation of kickplates advanced to 75% complete (520 to date). Welding in the Hot Pipe Trench was 32% complete. Process equipment installation included vessels TK-101, 103, 305, 310, F-324, and two vacuum pumps. Installation of heating and ventilating equipment in 202-A was 40% complete, and power take-off rails for the remote crane were started. At 291-A Fan House, three blowers were set, and the concrete air tunnel was completed. Fabrication of the stainless steel liner for 291-A Stack was started by the vendor in Tacoma. At 211-A Tank Farm, structural concrete was completed, and steel erection was completed for Tanks 20, 21, 40, and 41.

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

June 30, 1954

for J. S. McMahon, Manager - Projects

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

CG-587 - TBP Waste Scavenging

Scoping and preliminary design have been completed. Material requisitions are being prepared.

CG-588 - Ammonia Scrubbers, Redox

Scoping and preliminary design have been completed. Revision No. 1 of the project proposal was transmitted to the A.E.C. on June 8, 1954.

CG-589 - Dejacketing and Ultrasonic Equipment - 105-C Building

Scoping has been completed. General Electric Company has been asked by the Atomic Energy Commission to advise as to the overall planning on this project before construction funds are authorized.

IR-178 - 440-Volt Substation - 189-D Building

Three transformers have been located on the plant, and the transformer pad has been installed. Procurement of material required for the inside electrical work has been started by Plant Forces.

ER A-2750 - Redox Stack Cleaning

This work is being performed on a "Work Order" basis. Washing was started on June 29, but was stopped because of contamination of air in the 202-S Building. Plans have been made for resuming the operation in early July, 1954.

ER A-6021 - Study of Future Graphite Fabrication Facilities

A study was completed and a report prepared indicating the suitability of area machine shops to handle graphite machining on a small scale. It was informally recommended that present graphite machining be completed in 2101 Building, and that the small amount of predicted graphite machining should be done in 300 Area.

2. Final Reporting

CA-192 - Remodeling Building 108-F for Biology Laboratory

This project has been completed with the exception of shielding in the X-ray room which must await procurement of shielding material. The Physical Completion Notice was issued on June 24, 1954.

CG-511 - Completion of Minor Construction Fabricating Shops

The Physical Completion Notice was issued on June 28, 1954.

CG-550 - Reactivation of Facilities

This project was completed during late June, 1954. Information for the Physical Completion Notice is being assembled.

CG-564 - Installation of Additional Ball 3X Equipment - 105-C Building

This work is being closed out with minor exceptions as of July 1, 1954. Information for the Physical Completion Notice is being assembled.

3. Current Projects

CA-431-C - Metal Examination Facility - 105-C

Completion status remained at design 100%, construction 23%. General Engineering Laboratory has shipped the slug weigher, thus completing their work. Work was started on installation of the transfer rack and bucket dumper in the 105-C Storage Basin.

CG-496 - Recuplex Installation - 234-5 Building

Design had been completed previously; construction progressed 10% to a total of 50%. Work by the lump sum contractor was completed except for final grading and installation of vent filters. The monitoring wells are to be installed adjacent to the crib by the U. S. Geological Survey.

Nearly all vessels and most of the process valves for installation within 234-5 Building have been received. Installation is proceeding rapidly.

CA-512 - 100-K Reactor Facilities

100-KW and 100-KE Water Plants

Overall design of water plants remained at 99.8% complete. Construction progress was as follows: KW progressed 2.8% to a total of 94%; KE progressed 11.6% to a total of 77.8%; general facilities progressed 3.7% to a total of 85.5%. Cumulative totals of concrete placed to date were: KW water area 79,920 cubic yards; KE water area 76,288 cubic yards; general facilities 14,324 cubic yards.

At 181-KW River Pump House, five pumps and three ball valves are in operating condition. The sixth pump motor, for Pump No. 5, is awaiting new bearings. At 165-KW Building, Boiler No. 1 is being operated on a preliminary basis, and Turbine Generator No. 1 has been run in preparation for preliminary tests. Work on Boilers No. 2 and 3 consisted of piping, insulation, instrumentation, and electrical services. Testing of switchgear, motor control centers, and other electrical equipment was in progress.

At 190-KW Building, primary pumps Nos. 1, 2, and 4 have been completed with new bowls. Although no acceptable castings have been produced for secondary pumps, the present castings are being used on a temporary basis. Secondary pump motors Nos. 1, 2, and 3 have been run and aligned with the gear and flywheel. The heating and ventilating equipment in this building was completed except for minor items.

The 183-KW Filter Plant continued to provide water necessary for flushing. The building structure and major equipment installations were completed. Installation of necessary piping and control wiring was in progress.

Construction work on 165-KE and 190-KE Buildings was about three months behind corresponding work in KW water area. Work during the month included setting of secondary pump drives, boilers, turbines, and switchgear. Very little work was accomplished by pipefitters and electricians during the month.

Work on the outside utilities consisted of wiring and cleaning switch insulators at 151-KW and KE Substations, cleaning the 107-KW Retention Basins, installation of equipment in the 1700 Buildings, and the start of perimeter fences and road grading.

Concrete for Building 1706-K was placed at the 0' 0" slab and the north filter walls to ± 3' 10". The fish ponds and the 3" lines between the heat exchanger and the 1706 Building were tested.

105-KW and 105-KE Reactor Facilities

The graphite to be retained at Hanford was prepared for transfer to Purchasing and Stores Section. About 250 tons of rejected carbon has been returned to National Carbon Company. A study of the possible uses of 2101 Building was continued.

Construction progress on the reactors was as follows: KW progressed 8.7% to a total of 87.1%; KE progressed 5.3% to a total of 71.7%.

The structural work at 105-KW and 115-KW Buildings consisted of placing top slabs over the unit, grouting in horizontal rod sleeves, installing partitions in the office area, and testing equipment. Following development of acceptable equipment, work on the storage basin monorails was resumed by the subcontractor.

Progress of mechanical work included installation of 105-KW downcomer, completion of 105-KW ductwork, run-in of main exhaust fans and air compressors, and piping necessary to riser drains, cross-ties, and valves.

For the 105-KW Reactor, vertical safety rods were completed, and about 75% of the VSR cylinders were placed. Horizontal control rods are being installed and aligned. During this installation each rod is aligned with the help of optical instruments before proceeding to the next; to date nine assemblies have been completed. Work was continued on the Ball 3X skip hoist, ball valves, and welding. Installation of outlet nozzles was begun on June 15, and about 20 nozzle installations have been accepted. The crossheader expansion joints and valves have been installed.

Electrical work was continued on all systems. At the unit substation, Bus No. 1 and transformer No. 1 were in service for preliminary testing. Communication systems are being installed, and control center systems are being tested. Electrical work was resumed in the 115 Buildings.

Instrumentation has progressed into final stages of installation and connecting.

For 105 and 115 KE Buildings concrete floor slabs were placed for X1 and X2 levels and over the inner rod room. The brick wall is being installed between the Ball 3X Room and the Storage Room. Other installations are permanent doors and hardware, handrails, and equipment in the Viewing Pits.

Preliminary air tests of the 105-KE Reactor were started June 22. Pressure up to 60 pounds H_2O was maintained with a leakage rate of about 950 cubic feet per hour. Vertical safety rod step plug casings and Ball 3X transition castings were installed before the test. Installation of structural steel components was continued for the top biological shield, and the cooling tubes were hydrostatically tested. All process tubes have been installed, and about 75% of the tube ends have been "vanstoned". This work is to be completed after the unit air test. Work on the Ball 3X System included installing skip hoist up to 90-foot level, placing of gravity trough, and welding of flanges.

Electrical work consisted of wiring and installation of conduits, plus preparation for preliminary testing. The transfer crane, downcomer crane, and the Ball 3X crane motors have been given preliminary tests.

Instrumentation work included setting of control panels, installation of tubes, and installation of thermocouples.

Work in the Tube Shop was complete except for cleaning of spare parts. The Downcomer Shop work was about 98% complete, and the Crossheader Shop work was about 90% complete.

CA-513 - Purex Facility, Part "A"

Design was essentially completed during the month; construction progressed 8.6% to a total of 48.6%.

All Vitro specifications, requisitions, and acceptance test procedures have been approved, and 98.2% of the drawings have been approved. Procurement action, approval of vendor's drawings, and review of bids were continued on a diminishing scale. Design alterations of the 291-A Stack are being prepared, and the detailed redesign for installation of the capacitance type interface control was progressing.

Miscellaneous concrete placements for 202-A Building and related structures amounted to about 4300 cubic yards, thus bringing the total concrete placed to about 97%. Concrete block work in the east end of 202-A Building was completed. Of the required 179 cell cover blocks, 171 have been poured and are being painted.

Installation of piping in the Hot Pipe Trench was 32% complete. In the cell walls 520, or 89% of the kickplates have been installed. Power take-off rails for the remote crane were started. Installation of heating and ventilation equipment for 202-A Building was about 40% complete.

Installation of process equipment included vessels TK-101, 103, 305, 310, and F-324. Two vacuum pumps were installed in the west end of the Sample Gallery. The installation of elevators was about 90% complete.

Minor Construction forces completed tie-ins between 282-E Pump House Addition and 283-E Filter Plant, the 8" water line between Hot Semi-Works and 272-E Building, and the tie-in to the Export Water Line.

Concrete placement in 203-A Storage was essentially completed. Good progress was made on process pipe installations, the pipe encasement from 203-A to the 202-A Buildings, and minor portions of structural steel supports.

At 211-A Tank Farm, structural concrete was completed, and steel erection was completed for Tanks 20, 21, 40, and 41.

Blowers are being set at the 291-A Fan House. The stainless steel liner for 291-A Stack is being fabricated by the vendor in Tacoma.

The lump sum contractor for 283-E Filter Plant Addition completed roofing on June 25, and all masonry was completed. The No. 1 filtered water pump was installed and tested, and the 2300 volt switchgear was installed.

At the 284-E Power Plant Addition installation and rolling of tubes for both boilers was completed. The roofing was completed on June 26, and the siding was about 60% complete. Cinder recovery fans and turbines have been set and aligned.

Progress on the 241-A Tank Farm was generally slow. Erection of steel tank liners was approaching completion. About 13% of the tank wall concrete was placed, and concrete for diversion boxes and encasements was about 90% complete.

CA-513-D - Hot Semi-Works Conversion

Design had been completed previously; construction progressed 9% to a total of 59%. A revised project proposal is being prepared to request additional funds and extension of time. Detailed design for the self-concentrator was completed.

"A" Cell was complete except for air-operated valves and pumps. Pipe and tube installation was 50% complete in "B" Cell, and 80% complete in "C" Cell. Pipe for the line to "C" Farm has been sent to Los Angeles for application of protective coating, and it is expected to be returned by July 6, 1954.

Work on the self-concentrator was started during late June, 1954.

CA-514 - 300 Area Expansion Program - Production Facilities

Design progressed 2% to a total of 97%; construction progressed 6% to an over-all total of 40%. For Phase II of 313 Building Addition the structural steel roofing, partitions, and doors were completed. The heating and ventilating subcontractor has completed about 85% of sheet metal work, and the subcontractor for controls began work on June 21, 1954.

The interior installation of equipment was 73% complete. Motor control centers for the first line are being installed. The methanol still and accumulator tank have been set.

For Phase III modifications of the existing 313 Building, acceptance tests are being conducted on transformers. Plant Forces have made tie-ins to the 352 Substation. Shop fabrication of heating and ventilating units was started during the month.

Phase IV, installation of process equipment was about 6% complete. Three of the Ajax furnaces have been completely lined and set in place, and the other three of the initial shipment are being lined. The final shipment of six furnaces is in transit. The methanol distillation column has been received.

The steam poles for general utilities have been set. Fabrication of the 8" steam line, the 3" air line, and the hangers was started during the month.

CG-535 - Redox Capacity Increase, Phase II

Design progressed 1% to a total of 96%; construction progressed 19% to a total of 64%.

Concrete placement was completed in the 233-S Building except for one equipment pad in the process room floor. Progress has been delayed by the lack of fittings for underfloor piping. Electrical conduit under the floor was completed. Fabrication of stainless steel vessels was completed during late June, 1954, and the 204-5 Tanks are being fabricated. Of the estimated 142 Phase II jumpers required, 100 have been fabricated. Cold side piping and instrument changes for Stage I were essentially complete.

CA-539 - Additional Waste Storage for Redox

Design had been completed previously; lump sum construction progressed 1.5% to completion, and the clean-up was completed on June 9, 1954. The Minor Construction portion of construction was 96% complete.

Temporary construction buildings and the railroad spur are being removed. The structure of the instrument house addition has been completed, but installation of instruments must await arrival of equipment. The condensate pump for TK-106 is being assembled and installed. Instrumentation and electrical work was continued in the addition to 241-SX Condensor House.

CA-546 - Fuel Element Pilot Plant

Design progressed 2% to a total of 92%; overall construction progressed 1% to a total of 12%.

An order has been placed with the Udylite Corporation for design of the electroplating machine. The contract drawings were revised to include revisions to the existing trenches and addition of a new pipe trench to accommodate the electroplating facility.

The notice to proceed was issued by A.E.C. on June 11, 1954, and the contractor moved a temporary office to the job site on June 16. Actual construction work was started during the latter part of the month.

CG-558 - Reactor Plant Modification for Increased Production

Aluminum Company of America is performing development work on extrusions for horizontal rods. Purchase requisitions have been issued for all engineered components needed for rod replacement. Additional purchase requisitions have been issued for pipe and electrical cable. The first draft of the construction schedule is being prepared for comments.

The first major shutdown has been established for February, 1956.

CG-573 - Hanford 3X Program - 300 Area

Design progressed 19% to a total of 98%; construction progressed 23% to a total of 93%. This increase of construction percentage was partly attributed to deletion of the Irridite Facility, Slurry Recovery, and Ultrasonic Bond Test.

A directive has been received from A.E.C. authorizing $860,000.

Acceptance test procedures have been prepared and approved for the hydraulic hot press system, instrumentation, and furnaces. A vendor's representative has arrived to supervise start-up of the hydraulic system.

Completed work in the 313 Building consists of electrical power to the presses, electric bus duct and gutter, fabrication of tanks, exhaust units, hydraulic pipe to the dye press, and installation of the vacuum cleaning unit. The furnaces and three lathes were set. Service piping, power, and drains to the tank were started.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 4% to a total of 55%. Construction was resumed and progressed 2% to a total of 13%.

CA-187-D-III - Redox Cooling Water Disposal Basin

Lump sum work had been completed previously. Phase I construction work to be performed by Minor Construction progressed 14% to a total of 99%. Phase II construction, consisting of installation of a weir-box on the main 24"-line within the Redox exclusion area, was started during the current shutdown of Redox. A revised project proposal requested $130,000 for the second crib and is being circulated for approvals.

CA-434 - New Bio-Assay Laboratory

Design had been completed previously; Phase I construction progressed 1% to completion; Phase II construction remained at 98% complete. Since hot-plate vendors previously consulted are unable to meet specifications, no bids have been received. Inquiries have been sent to seven other vendors. All material to be procured by G.E. is on order, and about one-third has been received.

CA-441 - Solvent Building

Bids for the lump sum contract were opened on June 24, 1954. The apparent successful low bid was $29,500, compared with the fair cost estimate of $28,000.

CA-516 - Gable-Butte Railroad

Design had been completed previously; construction progressed 37% to a total of 38%. Since the new track did not close with the existing track by about 4', it was necessary to re-stake about 420' of track. This change did not require movement of any fill which had been placed.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Construction by Plant Forces progressed about 1% to a total of 3%. Revision No. 2 to the project proposal is being prepared to include Tanks 1901-B and 1902-B. Minor Construction is performing decontamination work which must be completed before the contractor begins his portion of the project. Plant Forces are modifying pipe within the 184-D and F Buildings.

CA-533 - Hanford Works Official Telephone Exchange

Design had been completed previously. Bids for furnishing all labor, equipment, and materials for the building were opened. The apparent low bid was $110,700, compared with the A.E.C. Fair Cost Estimate of $93,000 and the Project Section estimate of $105,000.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

Design was revised downward to a total of 85%. The drawing and specifications prepared by the Design Section have been reviewed, and a further study is being made on the feasibility of installing a new type of effluent disposal field.

CA-544 - Central Distribution Headquarters

With scoping completed, the justification is being revised, and the project proposal is to be resubmitted.

CA-548 - (ER A-1211) Reactivate Project Proposal for New VSR Test Tower

The project proposal was transmitted to A.E.C. on June 14, 1954, and is awaiting authorization.

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

Completion status remained at design 100%, construction 6%. The large purchase order for hoods is to be placed soon. Procurement of material for Minor Construction work is being expedited.

CG-551 - Expansion of 234-5 Building Facilities

Design had been completed previously; construction progressed 9% to a total of 31%. Task II revisions are 45% complete and are proceeding very satisfactorily. Task III shop fabrication was 46% complete, and the assembly of parts in the shop mock-up was 25% complete. Task III work was 5% behind schedule because of the combined effect of many minor problems; however, the work is progressing steadily.

CA-555 - Graphite Hot Shop and Storage Building

With preliminary design completed, the revised project proposal is being routed for approval. Detailed design is to be started during July, 1954.

CG-556 - X-Level Controlling and Recording Equipment

Design had been completed previously; construction progressed 6% to a total of 29%. The process water heater and the pressure reducing station were fabricated.

CG-559 - Process Tube Flow Facility - 189-D

Design had been completed previously; construction progressed 4% to a total of 99%. Following difficulties during acceptance testing, the steam jacket and the process tubes were reinstalled. Insulation was 75% complete. A revised "Construction Progress Schedule" was issued during the latter part of the month.

CG-562 - Waste Metal Recovery Plant Modifications

Completion status remained at design 100%, construction 76%. The request for extension of time has been held by A.E.C. to await a firm proposal for additional work. A revised scope and revision to the project proposal is being prepared by the Design Section.

CG-563 - Modification to 314 Building and Installation of Electroplating Pilot Plant

Design had been completed previously; construction progressed 14% to a total of 36%. Three control and two exhaust units were being installed. The cooling units were set, and the underground process sewer was completed.

CA-566 - Building for Prototype Physical Constants Test Reactor

Design had been completed previously. The A.E.C. is preparing bid assemblies for issue during early July. The bid opening date has been schedule for July 28, 1954.

CG-567 - Alum-Activated Silica Facilities for 100-B, D, F, and H

Construction progressed 10% to a total of 88%. Work completed during the month included the installation of pumps and revised piping in 183-DR and the installation of a tile line to 108-D Building.

CG-569 - Replacement of Catch Tanks 311-ER and 302-BR - 200-E and W

Design had been completed previously; construction progressed 20% to a total of 70%. Work at the 200-W Catch Tank was completed except for backfilling. Risers for the 200-E Catch Tank have been fabricated.

CG-572 - Particle Problem Animal Exposure Equipment

Design progressed 30% to completion. Construction began and progressed to 1% complete. A revised project proposal covering the Phase II work has been forwarded to the A.E.C. Since the hoods in 3706 Building were found to be more contaminated than expected, they will be left in the building until 1705-F Building is ready to receive them. Requisitions have been submitted for all major items of equipment.

CG-574 - Irradiation

During July, 1954, the A.E.C. is expected to clarify the extent of work to be done on this project.

CG-575 - Extraction

During July, 1954, the A.E.C. is expected to clarify the extent of work, if any, to be done on this project.

CG-576 - General Improvements to Laboratory Area - 300 Area

Design progressed 15% to a total of 75%; construction progressed 13% to a total of 48%. Detailed design sketches have been completed for installation of hood ductwork in Room 12-A, and detailed design for ductwork in Room 42-B is being

prepared, Completion of Section 14A-22A awaits delivery of the sump pump. Piping and electrical services have been started in Room 42-B. Work progressed in Rooms 10-A and 12-A. The hoods have been removed from Rooms 2-A and 3-A preparatory to installation in Room 12-A.

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

Purchase requisitions for turrets and recorders were sent out for bids during the month.

CG-579 - Effluent Water Monitoring Improvements - 100-C Area

Purchase requisitions for turrets and recorders were sent out for bids during the month.

CG-581 - Development Facility

The Commission is expected to advise, during July, 1954, as to the extent of work, if any, to be done on this project.

CG-585 - Oxidizer Off-Gas Treatment - Redox

Design had been completed previously; construction progressed 48% to a total of 71%. The fabrication of dunnages and filters was completed during the latter part of June. Other completed work included mock-up of the J-3 filter and the J-2 scrubber by Plant Forces, fabrication of the jumpers required for Stage I, and all cold-side piping and instrumentation necessary for Stage I.

CA-590 - (ER A-756) Fly Ash Collection Equipment - Building 384

Submittal of the project proposal has been delayed because Transportation Section has proposed the use of a smaller "Cat" for pushing coal cars. This proposal affects a savings previously estimated.

IR-162 - Fire Protection Buildings, 272-E and W

Completion status remained at design 100%; construction 1%. The subcontractor has prefabricated most of the pipe and delivered it to the site. Start of construction has been delayed until proper personnel clearances can be obtained.

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The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month.

ER A-755 - Study of Classified Scrap Disposal Problem - 300 Area Library

The informal request was transmitted to A.E.C. on June 18 and is awaiting authorization.

ER A-757 - Temperature Control Improvement - 108-F Building

The informal request was transmitted to A.E.C. on June 1 and is awaiting authorization.

ER A-758 - Mechanical Maintenance Shop Centralization - 100 Areas

With scoping completed, the project proposal is being routed for approval.

ER A-761 - Decontamination Facilities, First Aid Stations, 100-H and 200-W Areas

No work was performed during June, 1954, because of higher priority work. However, appropriate information on decontamination facilities has been received from the Chalk River project in Canada, Savannah River project, and Argon National Laboratory.

ER A-1212 - Diversion Outlet from Retention Basins, D and F Areas

Because of insufficient justification, Plant Engineering Section has requested verbally a close out of this work.

ER A-1213 - Metal Loading Facility, 105 Buildings

The necessary information for submittal with the project proposal has been forwarded to the Design Section.

ER A-2748 - 221-T Building Roof Repair

With scoping completed, the project proposal has been submitted to A.E.C. for review.

ER A-2749 - Sheltered Welding Manifolds - 200 Areas

With scoping completed, work on preparation of this proposal was resumed during June. The revised classification and budget status have been obtained, and an estimate has been requested.

ER A-3106 - 300 Area General Improvement Program

Scoping and preparation of the project proposal are each about 70% complete. The scope of work has been revised to include installation of lighting facilities for the parking lot immediately south of 300 Area.

ER A-3107 - Hanford Works Laboratory Exceptions

Work Order Nos. CC-6200 and EE-6204 were closed out on June 22, 1954. It is expected that Work Order Nos. CC-6024, EE-6207, and CC-6181 can be closed out during early July, 1954.

ER A-3108 - Replacement of 313 Building Roof

Preliminary design was about 70% complete. The rough draft of the project proposal has been completed, and copies have been forwarded for review.

ER E-488 - Tocco Induction Heating Unit, 314 Building - 300 Area

Comments on the scope drawing SK-3-6130 are being recorded by revision to the drawing. The high spot estimate indicates work of project magnitude.

C. RELATED FUNCTIONS

A few vendor inspectors have been transferred to other assignments, but the work load for the majority has continued to be heavy. The Corrosion Testing Program decreased slightly to a total of 545 samples. It is apparent that the number of General Electric purchase orders will increase sharply since the approval of CG-558, Reactor Plant Modifications for Increased Production.

The major inspection problem for the month of June centered on the pumps being manufactured by Bingham. Castings for the 12 secondary pumps have been rejected for permanent service, and new castings are being made by General Metals Corporation, San Leandro, California. Some of the rejected castings may be used temporarily.

The order for vertical safety rod cylinders was about 50% complete. Delivery of the blowers has been made possible by cooperation of the vendor in performing adequate tests.

Fabrication and delivery of Purex vessels continues to be slow. The vessel supports were redesigned, and are now being manufactured. X-raying of welded pipe was continued, and there has been considerable rejected material. Some 1/2" pipe required complete replacement.

Delivery of Recuplex vessels continued at a good rate, and the problem of control valves apparently has been solved.

All eight Redox Phase II towers were shipped out before the deadline on June 8, 1954. Related work has progressed smoothly. Following is a resume of inspection activities during the month:

Item	Number
Total orders on hand requiring inspection	1279
Cumulative number of orders assigned to inspectors	1232
Number of orders assigned to inspectors this month	171
New orders received by Inspection during the month	153
Orders completed	79
Total requisitions for engineered equipment transmitted for Expansion Program	199
Total orders of engineered equipment placed for Expansion Program	164

At the end of June there had been grand totals of 3045 Expansion Program requisitions for engineered equipment transmitted, and 2937 placed.

Reproduction output was 531,005 square feet during the 24 regular working days, including 193 hours overtime. The major orders processed during the month included 11,422 prints for 100-K Reactors, and 7971 prints for Purex.

Estimating Unit completed 22 estimates during the month. The completed estimates comprised the following: project proposal - 12, fair cost - 2, and scope - 8.

Field Surveys completed survey for the new settlement basin in North Richland. Other work included testing, area surveying for A.E.C., and obtaining of field data for design of 100-Area Modification work.

D. CRAFT LABOR

Percentages of voluntary terminations from the two major contractors remained high during the month of June. Kaiser Engineers and associated contractors lost 9.3%; Blaw-Knox and associated contractors lost 13%. Voluntary terminations from J. A. Jones Construction Company remained about level at 2.2%.

On June 24, 25, and 26 an arbitrator conducted a hearing on the dispute concerning retroactive pay for construction bus drivers who performed man-haul to the construction areas before and after the regular work day. The case of the union was built primarily on a literal interpretation of the contract language; however, the arbitrator was given information that, historically, isolation pay has not been made to employees who begin their day's work in Richland or North Richland. This case involves about $1,000,000.

The charge of unfair labor practice filed by Cisco Construction Company against the Pasco Building Trades Council was heard by the National Labor Relations Board on June 11, 1954. Cisco has been allowed to resume work in 200-W and 100-K Areas. However, the work which was being performed in 100-K Area by a non-union electrical subcontractor has been deleted from the contract. The deleted work is to be performed by Foothill Electric for Kaiser Engineers. The final decision of the Board is not expected for 30 to 60 days.

REPORT OF VISITORS

To Hanford

Charles S. Sherman, Air Reduction Pacific Company, Seattle, Washington, visited A. B. Dunning, Minor Construction Management Unit, to investigate failure of equipment.

Official Trips to Other Installations during June, 1954

P. J. O'Neil visited Udylite Corporation, Detroit, Michigan, from June 9 to June 10 to negotiate contract alterations; and he visited National Acme Company, Cleveland, Ohio, on June 11 to inspect equipment being fabricated for Hanford.

R. J. Cavanaugh visited the following companies from June 21 to June 23 to consult with fabricators of equipment for Project CA-514: Pacific Oerlikon Company, Tacoma, Washington; Marine Iron Works, Tacoma, Washington; Western X-Ray Company, Seattle,

Washington; and Fryer-Knowles, Seattle, Washington.

J. R. Kelly visited Bingham Pump Company, Portland, Oregon, on May 31 and June 1 to survey repaired high lift pump casings.

C. W. Harrison visited Knolls Atomic Power Laboratory, Schenectady, New York, from June 12 to June 17 for interview with Mr. Van Tessel.

J. R. Kelly and J. S. Hamilton visited General Metals Corporation, San Leandro, California, on June 27 to June 30 to inspect castings of secondary pump for 190-K Buildings.

R. C. Hollingshead visited C. L. Gougler, Kent, Ohio, from June 1 to June 15 to witness tests of pipe connectors for Project CA-513-A.

C. P. Lawson visited Northwest Furnace & Foundry, Portland, Oregon, on June 7 for coordination of inspection activities.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - JUNE 1954

EMPLOYEE RELATIONS SECTION

The number of applicants interviewed in June was 2,002 as compared with 1,604 for May. In addition, 140 new applicants applied by mail. Open, nonexempt, nontechnical requisitions decreased from 397 at the beginning of the month to 260 at month end. Two hundred and twelve employees were added to the roll and 117 removed during the month. Separations rate increased from .64% for fiscal month of May to 1.19% for fiscal month of June. These rates when converted to annual basis are 8.35% and 12.41%, respectively. During June, 46 new requests for transfer to other type work were received by Employment, and 40 transfers were effected. Attendance recognition awards were distributed to 194 employees in June, including 38 who qualified for four-year awards.

Four employees retired during the month and three employees died. One hundred and thirteen visits were made to employees confined to Kadlec Hospital, and 26 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 97.8%, in the Insurance Plan 99.1%, and the Employees Savings and Stock Bonus Plan 49.1%. At month end there were 830 registered under Selective Service and 780 military reservists were on the roll. Since August 1, 1950, 337 employees have terminated to enter military service, of which 104 have returned, 19 have not claimed re-employment rights, leaving 214 still in military-leave status.

A total of 195 new employees attended orientation meetings. Of this number, 96.8% have signed up to participate in the Pension Plan, 98.5% in the Insurance Plan, and 77.9% in the Good Neighbor Fund.

A second J.I.T. conference was conducted for supervisors of Metal Preparation, and this program was again received with a great deal of enthusiasm. It will be offered to other organizational components over a period of the next several months. Other Training and Development programs presented during the month included: Effective Human Relations, Principles and Methods of Supervision, HOBSO II, and Supervisor's Accident Prevention Program.

Over 4700 Service Recognition pins were presented to employees on June 1, 1954.

Excerpts from W. E. Johnson's statement to the Joint Committee hearings on the proposed disposal legislation were developed into a four-page statement for distribution to all employees at their homes.

Details of the Company's offer to Hanford unions in current negotiations were communicated to all employees via the GE NEWS and to members of management in greater detail through a Management News Bulletin.

Eighty-three adopted suggestions were approved for awards in June, resulting in cash awards totaling $1,105 with a total net savings of $7,404.09.

Employee and Public Relations Summary

PUBLIC RELATIONS SECTION

The News Bureau issued 51 news releases during the month.

Special releases consisting of pictures and feature stories on "periscopes" and "filter type viewers" used in the Optical Shop at Hanford were sent to four scientific magazines. The Director of Information from the University of Idaho was given pictures, news releases, and fact sheets covering science and engineering phases of the operation here at Hanford for use in free-lance writing for POPULAR MECHANICS magazine.

Hanford was represented by several speakers at the following meetings during June: Regional ACS Meeting in Richland, AIChE Nuclear Engineering Conference, Richland Chamber of Commerce, University of Washington, Eastern Washington Milk Sanitarians Association, Oahu Health Council at Honolulu, National Meeting of American Meteorological Society at Pullman, and TV demonstration for American Veterinary Medical Association in Seattle. Twenty-seven papers were cleared for Hanford authors during the month.

Four editions of Hanford Science Forum were written, transcribed, and released for broadcast during June, concluding this season's broadcast with the eightieth edition. It is planned to resume the series early in September.

Production of a color training and orientation film of the scale-model of the Purex Building was begun this month.

Early programs in the new radio series "Inside Hanford" will feature information about transportation at Hanford and the Suggestion System.

A total of 279 assignments were completed by the Photography Unit during the month, and 13,289 prints were produced.

SALARY ADMINISTRATION SECTION

A set of functional organization charts was prepared and mailed to Paul E. Mills of the Management Consultation Services Division. Necessary corrections to the structural sheets were prepared at the same time.

The work of reconciling positions within and between departments with the objective of assigning salary levels in the Company Salary Plan was completed.

Another group of employees on the Professional Plan was transferred to the E.A.&O. Plan, which practically completes this transfer begun nearly a year ago.

W. G. Urbon, Salary Administrator for KAPL, spent June 21, 22, and 23 at Hanford reconciling position levels betwen HAPO and KAPL.

Reimbursement authorization was requested and received from the Commission to change the present overriding adjustment from 12 percent to 15 percent on salaries of all exempt employees. Salary Administration records were adjusted in accordance therewith.

A preliminary issue of a Salary Administration Manual to accompany the new salary plan was completed.

Employee and Public Relations Summary

UNION RELATIONS SECTION

Formal agreements with the Hanford Guards Union and the Building Service Employees International Union were executed on June 16 and 17, respectively, and by letter of June 17 the Hanford Atomic Metal Trades Council accepted the Company's offer, subject to ratification by the Local membership.

Judge Harold Seering, Seattle, has been selected to act as arbitrator in a dispute with the Council involving the Company's refusal to recognize bargaining unit employees as being entitled to preferential consideration over non-bargaining unit employees when requests for transfers to bargaining unit jobs are involved.

A decision to continue the operation of the 2101 Building to accomplish the machining of certain "pieces" required in our research program has been actively opposed by the Atomic Energy Commission which has requested that the decision to proceed with the work be delayed for a short time.

Reimbursement Authorization No. 230 covering a 3% general increase for all nonexempt employees was received from the Atomic Energy Commission. A reimbursement authorization request was submitted to the Commission to cover changes made necessary by the recently negotiated Agreements between the Company and the Council, the Building Service Employees, and the Guards. A second reimbursement authorization request was made to the Commission to cover proposed changes in existing pay policies for non-bargaining unit employees.

The Wage Rates Unit participated in surveys conducted by the Dow Chemical Company, Allied Chemical and Dye Corporation, Lever Brothers Company, and Phillips Petroleum Company.

TECHNICAL PERSONNEL SECTION

Spring recruiting of new technical graduates brought 33 acceptances against an authorization of 40. An increase in the hiring authorization for technical graduates has been requested to offset expected losses of young engineers to military service, to be recruited principally from returning veterans via the College Placement Bureaus. The hiring of PhD and equivalent personnel has brought 7 acceptances (including 1 tentative) against an estimated need of 15 to 18. During the month cooperation continued with the Schenectady Office in locating PhD candidates with proper qualifications for Hanford work.

A cooperative program has been proposed and discussed with Employee Relations Managers of the other G.E. Atomic Operations whereby advertising, university alumni contacts, and other nation-wide activities would benefit Hanford, ANP, and KAPL, and take advantage of the geographical spread between these three sites.

During June, 3 rotational trainees were placed in departments and 2 others resigned. Twenty-four of the new hires have reported, making a total of 59 rotational trainees on the roll as of the end of the month.

The spring semester of the Graduate School of Nuclear Engineering was brought

TECHNICAL PERSONNEL SECTION (Continued)

to a close during June, and of the graduate level courses, 98 people of 105 registered completed their courses. Plans are now being formulated for courses to be offered in the 1954-55 school year. Emphasis must be given to attract more students to engineering and metallurgy courses.

HEALTH AND SAFETY SECTION

Four additional claims alleging hearing loss arising out of occupational exposure to noise have been transmitted to the State Department of Labor and Industries, bringing the total of such claims to five. The first such claim was rejected by the Department of Labor on basis of the Statute of Limitations (failure to submit claim within one year of time hearing loss was known to employee.) About 160 ear plugs were fitted for workers in the 190 and 182 buildings where personnel hearing protection has been made mandatory.

There were no major injuries in either Production or Community Activities during the month of June. The Production Activities performance, since the last lost-time injury, now involves 126 no-lost-time injury free days with an accumulated exposure of approximately 5,500,000 man-hours. There were 284 minor injuries during June, as compared to 289 in May.

Communicable disease incidence was at the lowest level of the year. With the cooperation of the P.T.A. and private physicians, 590 pre-school children were examined preparatory to entrance to school in September.

COMMUNITY OPERATIONS SECTION

Word was received that Richland was awarded a special citation for "Superior Pedestrian Protection Efforts" in the fifteenth annual American Automobile Association's Pedestrian Protection Contest. The award was made on the basis of general activities in connection with Richland's pedestrian protection program.

The Police Department radios were placed on the Fire Department frequency so that now all Community radio equipment operates on the one frequency separate from the Plant.

COMMUNITY REAL ESTATE SECTION

As of June 30 there were 306 housing applications pending.

COMMUNITY TRANSFER STUDY

The congressional hearing on the disposal legislation was held at the Columbia High School June 18 and 19. From comments made by Congressman Cole, the passage of disposal legislation this year is doubtful.

COMMUNITY TRANSFER STUDY (Continued)

The Atomic Energy Commission has received permission from the County Commissioners to file a government plat and are ready to proceed with the survey. The Atomic Energy Commission has met with title company representatives regarding easement problems. Retention of property for official use is still under study.

ORGANIZATION AND PERSONNEL

Total on roll June 1, 1954	860
Accessions	66
Separations	30
Total on Roll June 30, 1954	896*

*Totals include 59 Rotational Trainees, 1 ANP Trainee, and 10 Summer Program Trainees.

Employee and Public Relations
EMPLOYEE RELATIONS

General

Over 4700 Service Recognition pins were presented to employees June 1, 1954. So far we have learned of only four employees who did not choose to accept the pins. Two of them declined because they did not like to assume the risk of having to return the pins should they terminate; one felt that it would be best to divert the money expended under the Plan to stockholders, and the fourth indicated an unfavorable attitude toward the Company because he had been sent home without pay a few years ago because he was late reporting for work. This particular employee is a bus driver where we have a standard rule that bus drivers who report late for their shift are sent home.

Employment	May, 1954	June, 1954
Applicants interviewed	1,604	2,002

710 of the applicants interviewed during June were individuals who applied for employment with the Company for the first time. In addition, 140 applications were received through the mail.

Open Requisitions	May, 1954	June, 1954
Exempt	0	0
Nonexempt	397	260

Of the 397 open, nonexempt, nontechnical requisitions at the beginning of the month, 247 were covered by interim commitments. Of the 260 open, nonexempt, nontechnical requisitions at month end, 135 were covered by interim commitments. During June, 103 new requisitions were received requesting the employment of 126 nonexempt, nontechnical employees.

	May, 1954	June, 1954
Employees added to the rolls	80	212
Employees removed from the rolls	72	117
NET GAIN OR LOSS	+ 8	+ 95

Separation Rate:

Fiscal Month May, 1954		Fiscal Month June, 1954	
Male	Female	Male	Female
.33%	1.98%	.65%	3.57%

Over-all Separation Rate:

Fiscal Month May, 1954	Fiscal Month June, 1954
.64%	1.19%

During June, 16 employees left voluntarily to accept other employment, 6 left to enter military service, and 6 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	357
Number of requests for transfer received during June	46
Number interviewed in June, including promotional transfers	60
Transfers effected in June, including promotional transfers	40
Transfers effected since 1-1-54 including promotional transfers	296
Transfers effected in June for employees being laid off	8
Number of stenographers transferred out of steno pool in June	13
Transfer requests active at month end	283

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	5	174	1	180
Re-engaged	-	1	-	1
Reactivates	1	30	-	31
Transfers	-	-	-	-
TOTAL ADDITIONS	6	205	1	212

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	10	63	-	73
Removals from rolls(deactivates)	2	36	-	38
Transfers	6	-	-	6
TOTAL TERMINATIONS	18	99	-	117

GENERAL

	5-1954	6-1954
Photographs taken	158	374
Fingerprint impressions	130	258

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	5-1954	6-1954
General Electric cases	127	145
Facility cases	30	32
Total	157	177

Employee and Public Relations

EMPLOYEE RELATIONS

INVESTIGATION STATISTICS

	5-1954	6-1954
Cases received during the month	200	171
Cases closed	178	190
Cases found satisfactory for employment	170	182
Cases found unsatisfactory for employment	3	11
Special investigations conducted	33	10
Cases closed before investigation completed	53	31

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6631
One-year awards made in June for those qualifying in May	47
Total two-year awards to date since January 1, 1950	2293
Two-year awards made in June for those qualifying in May	44
Total three-year awards to date	1061
Three-year awards made in June for those qualifying in May	65
Total four-year awards to date	288
Four-year awards made in June for those qualifying in May	38

During June, 11 people whose continuity of service was broken while in an inactive status were so informed by letter.

Of the Instrument Trainees that were contacted at Dunwoody Industrial Institute, eleven have been called in.

Clerical - In 65 instances, the Wonderlic Personnel Test and the Minnesota Clerical Test were used to aid in the selection of clerical employees.

Instrument Trainees - Four instrument trainee prospects were tested, two of which are being processed further.

Supervisory Selection - Twenty candidates were administered appropriate test batteries and the results were interpreted and reports submitted to the interested evaluators.

Forty-four employees attended the Secretary-Stenographer Program held on June 25, 1954. This course will not be held again until Fall.

Employee and Public Relations

EMPLOYEE RELATIONS

Employee Benefits

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	113
Salary checks delivered to employees at Kadlec Hospital	23
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:

	May	June
Pension Plan	97.7%	97.8%
Insurance Plan	99 %	99.1%
Savings and Stock Bonus Plan	49.3%	49.1%

Fourteen letters were written concerning deceased employees and their families during June, regarding payment of monies from the Company and answering questions.

Three employees died during the month, namely:

Boyd E. Wood	W-6437-535	Engineering	6-18-54
Glen L. Dabling	W-9833-946	Fire Department	6-21-54
John C. Wisehart	W-18359-631	Manufacturing	6-1-54

Since September 1, 1946, 149 life insurance claims have been paid totaling $942,013. One death occurred in May that was not previously reported.

Four employees retired during the month of June, namely:

Roy L. Keagy	W-4032-627	Optional Retirement
Willard D. Sharpnack	W-842-346	Optional Retirement
Rose J. Lewis	W-4196-944	Optional Retirement
James C. Lewis	W-6675-942	Optional Retirement

During June, 23 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date, 299 employees have retired at Hanford, of which 160 are continuing their residence in this vicinity.

A total of 195 new employees attended Orientation Programs given by members of this group during the month of June. Of this number, 96.8% have signed up to participate in the Pension Plan, 98.5% have signed up to participate in the Insurance Plan, and 77.9% have signed up to participate in the Good Neighbor Fund.

During the month a member of this group visited all hospitals in the Yakima Valley, as well as the Pasco and Kennewick hospitals. These visits were made to assist hospital authorities with any problems they may encounter with our insurance plan.

Employee and Public Relations

EMPLOYEE RELATIONS

Employee Benefits

Of the 84 non-participants of the G.E. Insurance Plan who were contacted by their supervisors during June to encourage their enrollment in the plan, 16 have signed to begin participation. This represents a sign-up of over 19 per cent of the one per cent of our people who were not participating.

Sunday, June 20, the Retired Employees' Organization held their first annual picnic at Riverside Park, Richland. Approximately 125 people attended, including two members of this group. This occasion appeared to be quite successful and is an indication that the Retired Employees' Organization is enjoying better than average success.

During the past few years Fractional Horsepower Utility Motors have been ordered for employees through the Apparatus Office in Seattle. This procedure has never been an entirely satisfactory arrangement since there was always a question about giving the employees the discount established by the Company. In view of the foregoing, arrangements have been made with Fort Wayne to purchase these motors at that location at a discount which will approximate 60 per cent.

During the month considerable time was devoted in an attempt to obtain deferment for one of our employees in the Engineering Department. In our efforts a letter was directed to Lieutenant Colonel William Perry, a member of General Hershey's staff, submitting contents of our previous efforts to obtain deferment for his review. The reply to this letter was not successful, and deferment was denied.

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		780
Number of reservists classified in Category A	115	
Number of reservists classified in Category B	71	
Number of reservists classified in Category C	70	
Number of reservists classified in Category D	524	
Number who returned to active duty to date		138
Number who returned to active duty in June		0
Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	2	
Number of reservists classified in Category D	40	

Employee and Public Relations

EMPLOYEE RELATIONS

Military Reserve and Selective Service

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		830
Employees registered who are veterans		281
Employees registered who are non-veterans		549
Deferments requested to date (including renewals)		1313
Deferments granted		1046
Number of employees for which deferments have been requested		157
Number of employees classified in Category B	0	
Number of employees classified in Category C	1	
Number of employees classified in Category D	156	
Deferments denied and appealed at state levels		18
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		1
Deferments denied by local board and not appealed		11
Deferments denied by state board and not appealed		46
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		1
Deferments requested, later withdrawn		0
Deferments pending		57

Military terminations since 8-1-1950 are as follows:

Reservists recalled		116
Selective Service		216
Women employees enlisted		5
TOTAL		337

Employees returned from military service:

Reservists		61
Selective Service		43
TOTAL		104
Known number not claiming reemployment rights		19
Number of employees still in military-leave status		214

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

EFFECTIVE HUMAN RELATIONS seven groups met for their third conference on June 3, 8, 9, 15, 16, 23, and 30 with 63 supervisors completing all three meetings of this 12-hour program. These conferences deal primarily with actual human relations case studies. Cases are presented through various films, records, and written background, allowing group discussion on these and cases presented by supervisors attending the conferences.

PRINCIPLES AND METHODS OF SUPERVISION was presented for Group #71 during the two weeks of June 7-18, with 16 supervisors completing the course. PMS dinner-meeting was held Wednesday evening, June 2 at the Desert Inn for Groups 67, 68, 69, 70. Certificates of Completion were presented by the Manager of Employee and Public Relations Department. The General Manager was the principal speaker at the meeting. There were 55 members and guests present.

HOBSO II was presented June 8 and 28, with an attendance of 22 exempt personnel. This program emphasizes the effects of war-time economy, government controls, and post-war economy upon our American business system.

JOB INSTRUCTION TRAINING workshop was conducted June 14, 15, 16, and 18 in 300 Area, with 12 supervisors participating in all of the four meetings, and on June 28, 29, 30, a J.I.T. workshop was conducted for 7 supervisors of the 300 Area.

CONFERENCE LEADING was conducted June 21 and 22 for 16 area supervisors. These meetings are directed toward stimulating interest in learning and using the techniques of leading group discussions.

THE SUPERVISOR'S ACCIDENT PREVENTION program was presented June 24 in the 300 Area, with an attendance of 16 supervisors. This four hour meeting gives supervisors an opportunity to discuss the problems of accident prevention and how they as supervisors can develop their employees' awareness of the desirability of performing their jobs safely.

Members of Training attended local contract negotiations between the Company and HAMTC and Hanford Guards Unions June 1, 3, 4, and 17.

Additional preparations on materials for the J.I.T. workshop and the Supervisor's Accident Prevention program were made during the first two weeks of June.

Letters with Third-Quarter Training program schedule cards attached were addressographed and distributed to all exempt personnel during the week of June 7-11.

Employee and Public Relations
Employee Relations

Three economic films were previewed by the Training staff June 4.

A member of Training conducted New Employees Orientation on June 11.

At the request of the Supervisor of Technical Rotational Training Unit, Employee and Public Relations Department, Training Unit prepared material on human relations to be used in a program for rotational Tech Grads.

A Leaders Manual for the Supervisor's Accident Prevention program was prepared by Training Unit for use of the Manager of Safety Services Section, General Electric New York office.

The Secretarial-Stentographic program was held June 25 for 44 secretarial-stenographic personnel.

BASIC ECONOMICS was held June 29 for 8 supervisors. This participation type meeting emphasizes the basic principles of our economics system and the social, community, business, and the governmental aspects of our economy. There are also 5 films shown in this 8-hour program.

At the request of Technical Personnel Section, members of Training have acted as Master of Ceremonies for the Introductory Program for Tech Grads, on June 28, 29, and 30.

Supervisor's Handbook records:

Number Issued During June - - - - 9

Number Returned During June - - - 9

On Hand - - - - - - - - - - - - - - 178

Of the 178 on hand 62 are not usable because of missing pages, 9 have to be checked for completeness and 107 are ready for issuance.

Employee and Public Relations

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Excerpts from W. E. Johnson's statement to the Joint Committee hearings on the proposed disposal legislation were developed into a four-page statement for distribution to all employees at their homes, together with a letter prepared for the signature of the Manager-Employee and Public Relations. Inasmuch as this mailing was intended to influence legislation, all printing and mailing costs are being borne directly by the Company, and duplicating work and all handling for the mailing was accomplished by the Walla Walla Union Bulletin Commercial Printing Plant. The statements were posted Thursday evening, June 24, for delivery on Friday, June 25.

Details of the Company's offer to Hanford unions in current negotiations were communicated to all employees via the GE NEWS and to members of management in greater detail through a Management NEWS Bulletin. The priority message procedure was utilized to inform management of acceptance by the various HAPO unions.

"Operation Change-over"--a conversion of Classified Files to IBM operation was communicated to all employees via two GE NEWS issues with advance details to management in the Management NEWS Bulletin.

Lifeline column was edited for the June 4, June 25 and July 2 GE NEWS issues.

Safety topic for July, "How Long is Your Neck," was written, produced and distributed.

Production of the "The Vital Step," an 8-page booklet designed for "giveaway" at Training and Development's new Safety Training course, was completed.

Inserts were prepared for Area Injury Reduction Award posters.

The first in a series of 6 full-page messages on "Your Company" appeared in the June 4 GE NEWS. The remaining 5 will be published at one-month intervals.

Special Programs' promotion of the Service Recognition Program wound up with 7 photographs in the June 4 GE NEWS, one photograph in the June 18 GE NEWS and preparation of four reports on the promotion.

The health bulletin for July, "An Ounce of Prevention," was written and produced.

One hundred pre-printed health posters were imprinted with copy calling attention to the June health bulletin and posted throughout the plant.

Health Activities Committee meeting was attended by a Special Programs' writer in an advisory capacity.

One hundred and fifty copies of the "here's hanford" booklet were ordered from Printing to replace depleted stocks.

One thousand copies of "Safety is Part of Your Job" have been ordered through Central Stores.

Four Management NEWS Bulletins were published during the month dated June 10, 16, 17 and 25.

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Final art work for "Operation 4 S" booklets 1, 2 and 4 has been taken to Central Printing. In addition to the existing promotion, a sound slide film on work simplification is being considered for local production.

Fifteen-hundred name plate cards were printed.

The Independence Day holiday notice was written, duplicated and posted throughout the plant.

The May issue of "Your Manufacturing Month," was written and produced for distribution to Manufacturing exempt people.

During the month the following booklets were distributed through the employee information racks: 750 GE annual reports; 150 National Safety Council's "Passing Scene" (1000 copies of this booklets were obtained free of charge); 100 "Adventures Inside the Atom," 100 "Adventures in Electricity #5;"and 50 "Romance of Electricity."

Fifty-seven projection engagements were met during the month with showings to approximately 1250 people. Included were 34 showings of "Here's Hanford," approximately 790 people attending; and 22 showings of the health film "Be Your Age" with approximately 460 people attending.

Twenty-five films were obtained during the month from off-site sources for plant showings.

In addition to the weekly Sheldon-Claire posters, 90 copies of a GE photo news poster, 100 copies of an AEC-GE security poster, 100 copies each of two Service Company posters, 18 copies of the credit union poster and 100 copies of the health poster were put up throughout the plant. Also all suggestion boxes were serviced.

Awarding of $500 scholorships to four children of HAPO employees was announced in banner lead GE NEWS story. The syndicated New York story was localized by giving background information on each of the scholorship winners.

Outstanding work performed by a group of HAPO truck drivers in helping to stem recent floods in Idaho was publicized through a full page photo feature.

Syndicated material from New York on reduction in absenteeism throughout the company gave basis for local news story in GE NEWS on HAPO record. Facts were obtained from Financial to show how well HAPO compares with the rest of the company.

Full page feature in GE NEWS was devoted to activities of Radiometallurgy people which showed how irradiated materials are examined and tested.

Cooperative efforts of GE's Biology Section and the State Game Department to band geese within HAPO's boundaries were pictured in full page feature.

Announcement was made in GE NEWS lead story that a HAPO employee completed work through the GE Graduate School toward his Masters Degree making a total of 15 HAPO people who have completed work for their Masters in the GE School.

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Results of the HAPO GE NEWS participation in the 1953 Awards Program of the International Council of Industrial Editors were received. Scores in the GE NEWS classification ranged from a low of 45 to a high of 97. Although HAPO GE NEWS did not win a special award, it did receive a high score of 86 points. Of the 48 applicable subjects scored for the HAPO GE NEWS, ranging from poor, fair, good and excellent, 46 were rated either good or excellent, and 29 of these were "excellent."

GE NEWS made arrangements for a tour of the 300 Area for the staff and other Employee Communications people to look over manufacturing methods for possible GE NEWS coverage where security permits.

To assure timely revision of Store's Stock booklets, arrangements were made with Stores that Employee Communications will approve all Purchase Requisitions for booklets. In addition, Stores will apprise this Unit of current stocks following each inventory. Discontinuance of 12 outdated GE publications was authorized.

Three priority messages were flashed to management concerning: (1) Hanford Guards Unions acceptance of offer (2) HAMTC and BSEIU acceptance of the Company's offer (3) General Manager's statement concerning Richland disposal legislation.

Four issues of the Employee Relations News Letter prepared in New York, dated June 8, 11, 15, and 25 were distributed to all members of HAPO management, as was the June issue of the MONOGRAM. The GE REVIEW was distributed to a selected list of members of management in technical positions.

Art work developed for the GE NEWS during the month by the Employee Communications commercial artist included: full-page GE NEWS message on, "Your Company," a paste up of a photo montage for a 3/4 GE NEWS page, and two separate full-page photo and type layouts, and photo retouching.

Revised dummy and final art work were completed for three booklets to be utilized in a forthcoming work simplification information program.

Finished visualizers were prepared for the cover and 12 pages of a forthcoming radiation protection manual being developed for Separations Section by Special Programs.

Final art work was developed for the July health bulletin cover design and one illustration; also layout and final layout for the July safety topic, which involved cover design and 2 illustrations.

Miscellaneous art work during the month included: revised final art work for a new letterhead for the plant library, 5 visualizers for Training and a sign for GE retired employees.

Workmen's Compensation, Liability Insurance, and Suggestion Plan

Suggestion Plan	May	June	Total Since 7-15-47
Suggestions Received	160	169	14149
Acknowledgements to Suggesters	217	184	
Suggestions Pending Acknowledgement	27	12	
Suggestions Referred to Depts. for Investigation	217	376	
Suggestions Pending Referral to Departments	27	29	
Investigations Completed and suggestions closed	214	431	
Suggestions Adopted - No Award	0	4	
Adopted Suggestions Approved by Committee for Award	66	83	
Total Net Cash Savings	$ 10,950.90	$ 7,404.09	
Total Cash Awards	$ 1,420	$ 1,105	
Total Suggestions Assigned to Field for Investigation	666	674	
Total Number Suggestions Outstanding to Departments		655	

The highest award of $100 was paid to an employee in the Separations Section for his suggestion regarding a revision of the air locks in 234-5 Building. Savings in material and labor was realized through adoption of this suggestion.

An employee in the Reactor Section received the second highest award of $60 for his suggestion regarding the installation of angle iron frames in burial carts to improve transporting of processed material. This suggestion resulted in material savings.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 60 insurance companies and investigation agencies during the month of June, 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

	May, 1954		June, 1954	
Claims reported to Department of Labor and Industries	Long Forms	Short Forms	Long Forms	Short Forms
	52	432	46	366

Total Since Sept., 1946 - 21,061

Claims reported to	May, 1954	June, 1954
Travelers Insurance Co.	6	* 14

Total Since Sept., 1946 - 861

*Of the claims reported to Travelers Insurance Company during the month of June three were bodily injury claims and eleven were property damage claims.

Employee and Public Relations

Workmen's Compensation

James Browning, 8001070--Date of Injury: 3-19-52; Employer: General Electric Company; Nature of Injury: Head Injury.

A conference was held on 6-9-54 and it was agreed by all parties to dismiss Mr. Browning's appeal since he does not now desire a permanent partial disability award and the medical examiner selected by the Board does not recommend further treatment. Case closed.

I. M. Conner, 8000161--Date of Injury: 4-10-47; Employer: General Electric; Nature of Injury: Back.

At a conference conducted in Prosser on June 18 it was decided among representatives of the Department of Labor and Industries, the claimant, and the employer to continue the case for a hearing to be held sometime in August, 1954.

Clifford Scofield, 8001827--Date of Injury: Since 1947 to present; Employer: General Electric; Nature of Case: Hearing Loss.

A Report of Accident was filed with the State of Washington in which the claimant contends a loss of hearing due to noise exposure at his place of work. A letter was sent to the Supervisor of Industrial Insurance by the Acting General Manager requesting that prior to making an adjudication that an extensive investigation be made covering the legal, medical, and engineering aspects of the noise problem as it might relate to hearing loss. It is our understanding that such an investigation will be conducted by the office of the Supervisor of Industrial Insurance.

Liability Insurance

Harry B. Meyer and Norma N. Meyer vs. General Electric Company and Harold Petty, B-6835762.

On the 17th of May, Judge Hunter issued a Memorandum Opinion in which he concluded that the verdict of $22,323 as rendered by the jury was excessive and that it should be reduced to $7500 plus costs or in the event the plaintiffs rejected the reduction a new trial should be granted. It is our understanding that the plaintiffs accepted the reduction, however, upon the recommendation of Travelers' attorney both General Electric and the Commission approved Travelers' recommendation to appeal the judgment to the State Supreme Court. This appeal was taken principally because of the Court's instructions on the attractive nuisance doctrine and the Court's denial of our motion NOV.

O. E. Warren vs. General Electric Company and Lyman Powell, B-6835758.

On June 2, 1954, a Summons and Complaint was served upon General Electric and Lyman Powell alleging damages resulting from an accident in which the plaintiff was struck by a car driven by Mr. Powell on the 11th of August, 1953. The plaintiff is seeking damages in the sum of $80,816 and costs. Case was referred to Travelers for defense for both General Electric and Mr. Powell. It is our understanding that settlement negotiations are continuing between the Travelers and plaintiff's attorney and that the Complaint has not as yet been filed in Superior Court.

Employee and Public Relations

Training Program - Collateral Contractors

On June 28, 1954, S. L. Meyers, U. S. Navy Hospitalman, arrived for training which will be conducted by the Reactor Radiation Monitoring Group in conjunction with the Radiological Sciences Department. Arrangements for this training program were negotiated by General Electric representatives at KAPL on behalf of the U. S. Navy. Training will cover a period of about one month.

Employee and Public Relations

PUBLIC RELATIONS

During the month of June, the News Bureau issued 51 news releases. The breakdown by category, distribution and content was as follows:

Subject		Distribution	
Pay and Benefits	5	Local	42
Employment Services	11	Daily	2
Good Will	2	Tri-City Herald and Columbia Basin News	3
Technology and Research	18	Special	4
Safety and Fire	2		
Real Estate	1		
Administration and Legal	1	Content	
Richland-Hanford Protection	1		
Education and Library	5	Information	3
Health, Medicine	3	Pictures	1
Plant Services	1	Short releases	30
Security	1	Long releases	16
Total	51	Feature	1

Of the 42 local releases listed above, 10 were also sent to the science engineering list, and 2 to the business list. Of the 2 dailies, 1 was also sent to the local list and the other to the local and business lists.

Eight requests for information and pictures were received this month concerning the "plastic man" and protective clothing. Among the requesters were representatives from the Pictorial Publishing Company, the Employee News Service in the New York office, and the Managing Editor of YEAR.

Pictures and material of special interest activities at Hanford, pictures concerning the destroying of classified scrap, papers written by two Hanford scientists with the suggestion he obtain three other papers from Barry Haven's source file, were sent to a representative of Public Relations Services Division in Schenectady.

Special releases consisting of pictures and feature stories on "periscopes" and "filter type viewers" used in the Optical Shop at Hanford were sent to four scientific magazines for their possible use.

Two series of pictures on Hanford were sent to a representative of the Employee News Service in the New York office at his request.

The Director of Information from the University of Idaho visited the News Bureau and was given pictures, news releases and fact sheets covering science and engineering phases of the operation here at Hanford for use in free-lance writing for POPULAR MECHANICS magazine.

The Sunday Editor of the OREGONIAN requested pictures on the tie-in of power in the Hanford area which were shown in the May 14 issue of the GE NEWS. Pictures and more extensive background information will be sent.

Employee and Public Relations

At the request of one of our scientists, an abstract of his paper, an advance and a follow-up press release were mailed to a representative of the American Veterinary Medical Association for his information.

A special request from a reporter of the TRI-CITY HERALD resulted in a feature story concerning the Hanford Glass Shop. It was then released to our regular mailing list.

At the request of a free-lance writer for use in an article for a newspaper syndicate, information on the Richland hospital and health statistics of the people of Richland was sent to him.

Pictures and additional material on the heat exchanger were sent to the MONOGRAM at the request of Larry O'Brien, the Editor.

An article entitled "Operations Analysis," written by a member of Public Relations was published in the June issue of SUPERVISION magazine. Two letters of inquiry have been received and answered by the writer as a result of the article.

A story on maintenance problems in "hot" areas at Hanford was sent to BUSINESS WEEK for possible publication.

The following papers and speeches were cleared this month:

Presentation or Submission Date	Subject and Organization or Publication	Author
	"Neutron Scattering From the Walls and Air of a Laboratory;" for issuance as an unclassified report	D. W. Glasgow
5/28	"Progressive Employee and Public Relations;" Journalism class of University of Washington	D. F. Spellman
6/3	GE's Public Relations Program; Meeting of Eastern Washington Milk Sanitarians Association, Yakima	G. L. Brown, Jr.
6/7-11	"Radiative Capture of 300-Mev Neutrons in Hydrogen;" American Physical Society, Seattle	J. DePangher
6/8	GE's Public Relations Program at Hanford; Richland Chamber of Commerce	G. L. Brown, Jr.
6/11-12 (A)	"Recent Techniques in the Theory of Curve Fitting;" Regional ACS Meeting at Richland	E. M. Kinderman & J. L. Jaech
6/11-12 (A)	"Backmixing of the Continuous Phase in Pulse Column Solvent Extraction Contactor;" Richland Col. Valley Section Meeting of AIChE	W. H. Swift & L. L. Burger
6/11-12 (A)	"High Speed Motion Picture Studies of a Pulse Column Solvent Extraction Contactor;" Richland Col. Valley Section Meeting of AIChE	W. H. Swift
6/11-12 (A)	"Some Rapid Approximate Statistical Procedures for Analyzing Chemical Data;" Regional ACS Meeting at Richland	D. W. Gaylord C. A. Bennett
6/11-12 *	"A Systematic Approach to the Solution of Chromatographic Problems;" Regional ACS Meeting at Richland	J. E. Meinhard
6/11-12 *	"The Determination of Dibutylphosphate;" Regional ACS Meeting, Richland	D. W. Brite

(A) Abstract Only
* Both abstract and paper approved.

Employee and Public Relations

6/11-12 *	"The Affinity of Ru (IV) for Chloride Ion and Evidence for the Polymeterization of Uncomplexed Ru (IV) in Acid Solution;" Regional ACS Meeting, Richland	J. L. Swanson A. S. Wilson
6/11-12 *	"Porous Glass and Ion Exchange Membrane Salt Bridges;" Regional ACS Meeting, Richland	W. N. Carson, Jr. & C. E. Michelson & K. Koyama
6/11-12 *	"Columetric Determination of Phosphate;" Regional ACS Meeting, Richland	W. M. Carson, Jr. & H. S. Gill
6/11-12	"An Investigation of Chemical Species in Highly Radioactive Solutions by Means of Chromatographic Techniques;" Regional ACS Meeting, Richland	A. S. Wilson
6/11-12 *	"Some Kinetic Studies of the Tin (II) Reduction of Uranium (VI) in Hydrochloric Acid Media;" Regional ACS Meeting, Richland	R. L. Moore
6/11-12 *	"An Instrument for the Rapid, Automatic Determination of Extraction Rates;" Regional ACS Meeting, Richland	W. P. VanMeter
6/11-12 *	"Review of Recent Reactor Developments;" Regional ACS Meeting, Richland	E. L. Armstrong
6/20-26	"The Design Philosophy of Remote Operation and Maintenance of Separations Facilities;" AIChE Nuclear Engineering Conference, Ann Arbor, Mich.	J. M. Harty
6/20-26	"Distributor for Pulsed Columns;" AIChE Nuclear Symposium, Ann Arbor, Michigan	F. W. Woodfield, Jr.
6/21	"Benefits of an Intergrated Industrial and Public Health Program;" Oahu Health Council, Honolulu	R. R. Sachs
6/21 -24	"Hanford Radiological Instrumentation;" AIEE summer meeting, Los Angeles, California	W. A. McAdams
6/23	"Effect of Various Meteorlogical Elements on Temperature Profiles Observed in the First 400 Feet Above the Ground Surface at Hanford;" 129 Nat'l. Meeting of American Meteorological Society, Pullman, Washington	D. E. Jenne
6/23	"Some Observations of Turbulent Diffusion During Inversion Conditions;" 129 Nat'l. Meeting of American Meteorological Society, Pullman, Washington	B. Shorr
6/23	"A Portable Meteorological Mast;" 129 Nat'l. Meeting of American Meteorological Society, Pullman, Washington	P. W. Nickola
8/26	"Toxicity of Radioiodine;" TV Demonstration for American Veterinary Medical Association in Seattle	L. K. Bustad
9/14	"Fiberglass Air Filters for Hot Laboratories;" Local Naval Reserve Group	J. Gifford
10/15	"Hanford and the Nation's Atomic Energy Program;" Workshop, Washington Association of Junior Colleges	W. K. Woods

Joern Gerdtz, a free lance photographer presently working for TIME magazine, visited Richland to get photographs to be used in a special TIME feature about the Inland Empire.

* Both abstract and paper approved.

Employee and Public Relations

Mr. Gerdtz took photographs of eight different subjects in Richland, including housing, the business district, and the perimeter barricade.

A protective plastic suit was sent to E. E. Oliver at Schenectady. The suit is a complete unit that can be easily set up and exhibited and also sent with complete instructions for its use. The suit may be used by F. K. McCune as an exhibit for a speech he will make to the Public Utilities Executive's Conference. The suit will also be used in the observation of Harry Winne Day at Cherry Valley, New York. While it is in the East the suit will be photographed with the expectation of obtaining illustrations for institutional advertisements similar to those that have appeared recently in LIFE magazine. Approval was obtained from the AEC to send the suit East. It will be returned to Hanford when no longer needed there.

The Community Newsletter for June was sent to community leaders in Pasco, Kennewick and Richland.

On June 14 a display composed of a topographical map and charts was placed in the Richland library, to remain for two weeks. The display shows the biological chains in the Columbia River life and the effect of radiation from Hanford on them.

A representative of Public Relations attended a closed hearing arranged by a group who are members of the Bi-County Adult and Crippled Children Society on June 17. Dr. R. R. Sachs and Lucile Lomen also attended. Representatives of Richland School System, the State Department of Public Health, and the State Adult and Crippled Children Society attended the meeting. The question of whether or not to combine all facilities for teaching and treating crippled children within the school system was investigated. Public Relations representative attended because there was a possibility that statements to the press concerning General Electric's attitude in the question might be needed. It was decided that news releases would not be issued at this time.

Arrangements were made to supply the Richland meeting of the American Chemical Society and American Institute of Chemical Engineers with an exhibit depicting the work of Aquatic Biology in controlling contamination of the Columbia River. The picture tour of Hanford was also supplied in the form of slides with cutlines to be read as the slides were shown.

A second shipment of Construction Progress Motion Picture footage was made to the Hollywood Studio for developing and processing of a workprint. The film was returned this month and previewed by the Supervisors in Public Relations Section. The concensus was that a portion of the original film was damaged. Workprints made therefrom were again unsatisfactory and work was apparently not done according to terms of the contract. The poor processing of original film renders portions of it useless and this subject matter is not replaceable. The Contractor will be notified of our dissatisfaction. Consideration is being given to a visit to the Studio by representatives of the Contract and Photography Units to determine what steps should be taken to correct present problems.

Approximately 45,570 feet of film has been exposed to date on the Construction Progress Motion Picture.

A preliminary study and cost estimate on the production of a training-documentary motion picture was made for Radiometallurgy Unit, Technical Section, Engineering Department. The showing time of the black and white film was estimated at 20 minutes.

A promotional brochure on the new version of "Here's Hanford," the HAPO produced 16mm color motion picture, has been outlined and forwarded to Special Programs for a cost estimate. The brochure is designed to promote the use of the film by outside organizations. This film was shown to all staff officers at Camp Hanford at the request of A.E.C.

Production of a color training and orientation film of the scale-model of the Purex Building was begun this month.

Filming was done this month on actual testing of material in one of the HAPO reactors.

Customer Units have been asked to review motion picture films previously produced for them by Public Relations Section so Security classifications can be brought up to date. The four films are now "Restricted;" a category that is no longer in use.

All HAPO supervisors were sent a questionnaire requesting program topic suggestions for "Inside Hanford." Letters of acknowledgement were written in answer to more than 100 completed questionnaires. Early programs in the series will feature information about transportation at Hanford and the Suggestion System.

A 30-minute program to be telecast live from Spokane and Yakima was developed and continuity written. The program will feature a speaker from Radiological Sciences Department who will use displays to explain radiation protection at Hanford. The displays will include a toy electric train controlled by a radio-active source, protective clothing, models of shielded caves and remote-control tongs and apparatus.

A filmed opening for a closed-channel television information program was prepared at the request of Leo Bustad, Radiological Sciences, for use at the National Congress of Veterinary Medicine to be held in Seattle this coming August. The filmed sequence will introduce a panel discussion on "Radioactive Fallout," from atomic and hydrogen bomb blasts.

At the request of local AEC Management, public address and tape recording equipment was provided for the Joint Congressional Hearings conducted here this month. Seven microphones were employed and six hours of testimony were amplified and recorded.

The Computing and Procedures Units were provided with a sound system and three and one half hours of tape-recorded music which was played during their "Operation Changeover". Ninety-eight percent of the employees who were informally polled by a special questionnaire felt that the music contributed to their on-the-job welfare. A formal poll of the employees' reactions to "Music while you work" is planned and the information so gathered will be useful to determine the value of providing music on the job elsewhere at Hanford.

Employee and Public Relations

A preliminary survey was made and costs estimated for the production of a sound slidefilm to become part of the forthcoming plant-wide "Operation 4-S" cost reduction program sponsored by Employee Relations Section and coordinated by Manufacturing Department representatives.

The Technical Personnel Section was assisted in their program plans for the 1954 Introductory Program for Technical and Business graduates by supplying auditorium equipment and presenting the film "Here's Hanford."

A total of 279 assignments were completed by the Photography Unit during the month and 13,289 prints were produced, of which 9,873 were "A" and "B" employee identification photographs. A total of 3,416 prints were Area and news work.

A total of 5,100 feet of 16mm motion picture film (b&w) was exposed on 100-K construction project; 100 feet of 16mm motion picture film (b&w) was exposed for Public Relations Section; and 1,000 feet 16mm motion picture film (color) was exposed on Purex Construction, A.E.C.

See attached Statistical Report for Photography Unit.

PHOTOGRAPHY UNIT MONTH OF JUNE, 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	3¼"X4" (B&W) Slides	3¼"X4" Color Slides	16mm (B&W) Film
EMPLOYEE & PUBLIC RELATIONS DEPT.												
COMMUNITY OPERATIONS												
Library					12			12				
Police		4	399		38			141				
Recreation									13			
COMMUNITY REAL ESTATE												
Commercial Property			2					2				
PUBLIC RELATIONS												
News Bureau		68	6	41	816	12		39			47	
Public Information				8	53					23		
EMPLOYEE RELATIONS												
G. E. News		33	2	12	307		2	280				
Special Programs			14		64			28				
Training					3			2				
Employment	1,475							295				
TECHNICAL PERSONNEL			95					38				
HEALTH & SAFETY									7			
Industrial Medicine										5		
Public Health			30	20	20			39		4		
ENGINEERING DEPT.												
DESIGN			55		80	92		70		12		
PROCESS ENGINEERING						28		5				
TECHNICAL												
Pile Technology					5	40		20				
Applied Research					4	159		128		76		100'
Fuels Technology			105	25		250		51				
Metallurgy						103		4		11	5	
Separations Technology			4		3	3		11		9	3	
PROJECT					51			17				

(Continued)

PHOTOGRAPHY UNIT MONTH OF JUNE, 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	3¼"X4" (B&W) Slides	3¼"X4" Color Slides	16mm (B&W) Film
MANUFACTURING DEPT.					3							
METAL PREPARATION						12		4				
Power & Maintenance						30		15		6		
~~Plant Engineering~~					4			2				400'
SEPARATIONS			36					36				
Process					2			1				
REACTOR				45				6				
Radiation Monitoring					10			4				
RADIOLOGICAL SCIENCE DEPT.												
BIOLOGY				20							8	
BIOPHYSICS		8	3			34		6		6		
RECORDS & STANDARDS								4		7		
PLANT AUXILIARY OPERATIONS												
SECURITY	3,551	4,792			78	4		81				
LANDLORD FUNCTIONS						12		8				
GRAPHICS						2						
STATISTICS & COMPUTING										13		
A. E. C. SECURITY	55							11				
A. E. C. SAFETY					40			20				
A. E. C. OPERATIONS					1	4						
TOTALS:	5,081	4,905	751	171	1,594	785	2	1,380	20	172	63	500'

	APRIL	MAY	JUNE
Total Assignments	311	296	279
Total Negatives	1,511	1,737	1,380
Total Prints	10,042	9,541	13,289

UNION RELATIONS

Union Relations - Operations Personnel

Formal Agreements with the Hanford Guards Union and the Building Service Employees International Union were executed on June 16 and 17, respectively. The Hanford Atomic Metal Trades Council accepted the Company's offer by letter of June 17, subject to ratification by the Local membership. Such ratification is not expected to be accomplished before July 15. Atomic Energy Commission approval for the salary increases resulting from the offer together with approval for a uniform application of the new holiday provisions to the coming Independence Day holiday have been received. A request for reimbursement authorization covering the balance of the negotiated items has been forwarded tc the Commission.

Judge Harold Seering, Seattle, has been selected to act as arbitrator in a dispute with the Council involving the Company's refusal to recognize bargaining unit employees as being entitled to preferential consideration over non-bargaining unit employees when requests for transfers to bargaining unit jobs are involved. By mutual agreement between the parties, the dispute will be presented to Judge Seering by a stipulation of facts followed by simultaneous briefs which are to be prepared by July 15. The parties, likewise, will have the opportunity to reply to opposing briefs before the arbitrator's award is made.

The Council has notified the Company of a desire to schedule a grievance for arbitration involving the qualifications of certain Power Operators by-passed for promotion to Chief Power Operators. This appears to be for political reasons and our best guess is that the issue will not be pursued further.

Grievance Statistics:

A total of twenty-one (21) grievances were received and three (3) 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	11	4	0	15	6
Received this year	151	38	1	190	24

Employee and Public Relations

UNION RELATIONS

Grievance Statistics (Contd.):

ALL DEPARTMENTS

	HAMTC	HGU	BSEIU	Total Unit	Total Nonunit
Step I					
Pending May 31	7	1	0	8	3
Settled this month*	15	4	0	19	4
Settled this year	106	10	1	117	22
Pending June 30	3	1	0	4	1
Step II					
Pending May 31	11	18	0	29	0
Settled this month**	4	20	0	24	0
Settled this year	44	26	0	70	1
Pending June 30	8	1	0	9	0
Arbitration					
Pending May 31	1	0	0	1	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending June 30	2	0	0	2	

BY DEPARTMENTS

	Received		Settled Step I*		Settled Step II**	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year
Manufacturing						
Reactor - Unit	5	62	5	46	4	20
- Nonunit	0	5	0	4	0	0
Separations - Unit	4	30	2	20	0	9
- Nonunit	1	4	0	2	0	1
Metal Preparation - Unit	0	20	3	16	0	4
Plant Auxiliary Operations						
Transportation - Unit	0	9	1	5	0	5
Plant Protection - Unit	5	47	8	18	20	28
- Nonunit	0	1	0	1	0	0
Stores - Unit	0	1	1	2	0	1
Elec. Dist. & Tel. - Unit	1	3	0	2	0	0
- Nonunit	0	1	0	0	0	0

*Grievances brought to Step II prior to April 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 April 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	0	11	0	5	1	2
Hospital - Unit	0	1	0	1	0	0
- Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	0	6	0	5	0	0
- Nonunit	3	4	2	3	0	0
Engineering - Nonunit	2	5	1	7	0	0
Financial - Nonunit	0	3	0	2	0	0

BY SUBJECTS

	Manufacturing		Plant Aux. Operations		Emp. & Pub. Relations		Radiological Sciences		Engineering		Financial	
	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Year	This Mo.	This Yea
Unit												
Discrimination	0	0	0	1	0	1	0	0				
Jurisdiction	4	44	2	16	0	5	0	3				
Health-Safety-San.	0	7	0	2	0	2	0	0				
Hours of Work	1	6	0	23	0	0	0	0				
Overtime Rates	1	11	1	3	0	0	0	0				
Holidays	0	1	0	0	0	0	0	0				
Sick Leave	0	4	0	0	0	1	0	0				
Seniority	0	6	1	4	0	0	0	1				
Grievance Procedure	0	2	0	0	0	0	0	0				
Wage Rates	2	15	1	4	0	2	0	1				
Miscellaneous	1	17	1	6	0	1	0	1				
Nonunit												
Health-Safety-San.	0	0	0	0	0	0	0	0	0	1	0	0
Overtime Rates	1	4	0	1	0	0	2	2	0	0	0	0
Vacation	0	0	0	0	0	0	0	1	0	0	0	0
Seniority	0	1	0	0	0	0	0	0	0	0	0	0
Continuity of Service	0	1	0	1	0	1	0	0	0	0	0	0
Leave of Absence	0	1	0	0	0	0	0	0	0	0	0	0
Wage Rates	0	1	0	0	0	0	1	1	2	3	0	1
Work Assignment	0	1	0	0	0	0	0	0	0	0	0	2
Miscellaneous	0	0	0	0	0	0	0	0	0	1	0	0

*Grievances brought to Step II prior to April 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 April 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

Construction Liaison

Judge Harold Seering served as arbitrator at a hearing in Richland on June 24, 25, and 26. The issue concerned retroactive isolation pay for construction bus drivers (Teamsters) who perform a man-haul to the outer areas prior to and following their regular tour of duty. The Union's case is built essentially on a literal interpretation of the contract language which provides that isolation pay will be paid to those employees who are assigned to work behind the barricade rather than employees who are assigned and begin their day's work behind the barricade. Historically, both in construction and operations, employees who begin their day's work in Richland or North Richland have not received isolation pay. Something approaching a million dollars is involved in the case.

A decision to continue the operation of the 2101 Building to accomplish the machining of certain "pieces" required in our research program has been actively opposed by the Commission. The work, if allowed to proceed, would be performed by General Electric employees. In view of the jurisdictional problems between the Machinists and the Millwrights which caused numerous work stoppages during the period that the building was being manned with construction personnel and the fact that the over-all issues in this dispute have not been resolved, there is concern that (1) GE's operation of the building would serve to disturb the settlement of the issue and (2) that GE would be inadvertently dragged into a controversy which is essentially construction in nature. The Commission has requested that a decision to proceed be delayed for a short time.

National Labor Relations Board hearings in connection with an unfair labor practice charge filed by the Cisco Construction Company against the Building Trades Council were completed on June 11. The decision of the Board is not expected before 30 to 60 days.

Wage Rates

Reimbursement Authorization No. 230, covering a 3% general increase for all nonexempt employees, was received from the Atomic Energy Commission. This increase, the result of a Company-wide offer, brings the present "adder" to 15%. Wage Rates records for approximately 6,500 nonexempt employees have been revised to reflect the 3% general increase, which went into effect on June 10, 1954.

A reimbursement authorization request was submitted to the Atomic Energy Commission to cover changes made necessary by the recently negotiated Agreements between the Hanford Atomic Products Operation of the General Electric Company and the Hanford Atomic Metal Trades Council, the Building Service Employees International Union, and the Hanford Guards Union.

In order to maintain the existing pay and policy relationship between the bargaining and non-bargaining unit employees, submission of a second reimbursement authorization request was made to the Atomic Energy Commission to cover proposed changes in existing pay policies for non-bargaining unit employees.

UNION RELATIONS

Wage Rates (Contd.)

The Wage Rates Unit participated in surveys conducted by (1) the Dow Chemical Company, Rocky Flats, Denver; (2) General Chemical Division, Allied Chemical and Dye Corporation, Hedges, Washington; (3) Lever Brothers Company, New York City; and (4) Phillips Petroleum Company, Idaho Falls.

Four hundred thirteen (413) automatic increases and three (3) merit increases were processed during June. Requisitions for one hundred sixty-eight (168) prospective employees and additions to the payroll for one hundred thirty-six (136) new employees were approved. Review for proper classification, rate, etc., was made for twenty-four (24) reactivations, one hundred forty-four (144) reclassifications, one hundred ninety-five (195) temporary reclassifications and one hundred nine (109) transfers.

Employee and Public Relations

SALARY ADMINISTRATION

1. The normal administrative work of the Section was somewhat delayed owing to the large number of papers to be processed in connection with changes in organization. The delay was minimized by overtime work.

2. A set of functional organization charts was prepared and mailed to Paul E. Mills of the Management Consultation Services Division. Necessary corrections to the structural sheets were prepared at the same time.

3. The work of reconciling positions within and between departments with the objective of assigning salary levels in the Company Salary Plan was completed for all practical purposes.

4. Another group of employees on the Professional Plan was transferred to the E.A.&O. Plan, which practically completes this transfer begun nearly a year ago.

5. W.G. Urbon, Salary Administrator for KAPL, spent June 21, 22 & 23, at Hanford reconciling position levels between HAPO and KAPL.

6. Reimbursement authorization was requested and received from the Commission to change the present overriding adjustment from 12 percent to 15 percent on salaries of all exempt employees. Salary Administration records were adjusted in accordance therewith.

7. A preliminary issue of a Salary Administration Manual to accompany the new salary plan was completed.

Employee and Public Relations
Technical Personnel Section

TECHNICAL RECRUITING

Spring recruiting of new technigal graduates brought 33 acceptances (the quota was 40) as well as 10 business graduates authorized on a separate requisition. In addition, 10 very promising junior students were hired for the summer and are at work. The acceptances ratio for technical graduates is 38%, our highest percentage since 1951, and the quality of this year's men is estimated to be higher than in recent years.

An increase in the hiring authroization for hiring of technical graduates has been requested via the Workforce Budget proposal, this increase to offset expected losses of young engineers to military service. We shall endeavor to recruit additional technical graduates principally as returning veterans via the College Placement Bureaus.

The hiring of PhD and equivalent personnel has brought 7 acceptances (including 1 tentative). It is hoped that this total can be boosted, since the estimated need is 15 to 18. During the month cooperation continued with the Schenectady office in locating PhD candidates with proper qualifications for Hanford work. Information on 14 additional men was reviewed giving a total of 341 candidates referred to us by Schenectady during the 1953-54 season. 13 candidates visited this site during the month and 10 employment offers were made. 10 additional candidates are scheduled to visit Hanford within the next few months.

A cooperative program has been proposed and discussed with Employee Relations Managers of the other G.E. Atomic Operations whereby advertising, university alumni contacts, and other nation-wide activities would benefit Hanford, ANP, and KAPL, and take advantage of the geographical spread between these three sites.

ROTATIONAL TRAINING PROGRAM

During June, 3 rotational trainees were placed in departments and 2 others resigned. Many of the Sections who take these engineers have been awaiting the new fiscal year before making commitments and it is expected that placement will no go faster among the 35 trainees held over from 1953. Of 33 new hires, 24 have reported and have been given a special program of introduction and orientation. Each man has also been introduced to other alumni of his own school as a start in acquiring social contacts.

In general, the attitude of young engineers is to await the draft call rather than to enlist. We expect about 6 men to be drafted within the next 2 months.

Employee and Public Relations
Technical Personnel Section

EDUCATION - SCHOOL OF NUCLEAR ENGINEERING

The spring semester of the Graduate School of Nuclear Engineering was brought to a close during June and of the graduate level courses, 98 people of 105 registered completed their courses. Grades for all the courses, both graduate-level and under graduate-level have been mailed to all the students with appropriate personal letters. Suggestions were solicited from them as to future courses which they would like to see added to the School's curriculum. Faculty members from Oregon State and the University of Idaho visited Richland during June to confer on the School's operation and to visit with students registered with these schools. Plans are now being formulated for courses to be offered in the 1954-55 school year. Emphasis must be given to attract more students to engineering and metallurgy courses.

COUNSELING, TRANSFERS AND LOSSES

During June, 13 technical employees resigned from Hanford, and 3 major employees transferred to other activities with G.E. at other locations. Other transfers are pending.

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
JUNE 1954

General

Personnel Changes

Nine additions and nine deletions resulted in no change in the roll of 265 employees.

Visits

Dr. R. R. Sachs spoke at the Oahu Health Council's annual meeting in Honolulu and Dr. Norwood discussed his paper. Vacations were timed to allow such participation.
Mr. Bakko attended a meeting in Yakima for devising a cost formula to use in connection with state payment to hospitals for welfare patients.
Several routine visits were made to Richland by State Department of Health people.

Employee Relations

Employee attendance at 27 meetings was 197.

Industrial Medicine

Four additional claims alleging hearing loss arising out of occupational exposure to noise have been transmitted to the State Department of Labor and Industries, bringing the total of such claims to five. The first such claim was rejected by the Department of Labor on basis of the Statute of Limitations (failure to submit claim within one year of time hearing loss was known to employee.)
About 160 ear plugs were fitted for workers in the 190 and 182 buildings where personnel hearing protection has been made mandatory.
Medical examinations increased from 935 to 1265, while dispensary treatments decreased from 4725 to 4365.
The monthly health topic dealt with constipation.
Sickness absenteeism was 1.39% as compared with 1.62% for May, while total absenteeism was 2.28% as compared with 2.52% for May.

Safety & Fire Prevention

No major injuries occurred. As of July 9th plant operations have gone 134 days without a major injury and this is presumably qualifying for management's "token of appreciation gift" to each participating employee.
The injury record was as follows:

	Minor			Sub-Major			Major		
	May	June	To Date	May	June	To Date	May	June	To Date
Plant	289	284	1807	4	2	15	0	0	3
Community	14	24	129	0	0	0	1	0	1

Following two unusual fires in oxygen systems in Production facilities, recommendations were made for improvement in selection and maintenance of oxygen controls to lessen the hazard.
A rather large grass fire resulted in considerable damage to two fire tankers.

Kadlec Hospital

The average daily census decreased from 69.7 to 60.3 as compared to 74.0 a year ago. The low census was unexpected even in summer and resulted in a high number of nursing hours per patient day. The occupancy percentage for the mixed services was 52.5

General (Continued)

Public Health

Communicable disease incidence was at the lowest level of the year. With the cooperation of the P.T.A. and private physicians, 590 pre-school children were examined preparatory to entrance to school in September.

Social service counselors held 134 consultations with parents concerning problems with their children. Seventy-eight interviews were for assistance in marital conflicts.

Costs-May

	April	May	May Budget
Industrial Medicine	$41,025	$42,253	$42,801
Public Health (Oper.)	10,905	10,801	12,221
Kadlec Hospital (Net)	11,770	25,159	22,334
Hospital Expense Credits	2,057	579	2,500
Safety & Fire Prevention	13,178	13,440	14,812
Sub-total Health & Safety (Oper.)	78,935	92,232	94,668
Construction Medical (Industrial and Public Health)	1,088	1,074	1,663
Total-Operations & Construction	$80,023	$93,306	$96,331

The net cost of operating the Health and Safety Section before charges were assessed to various departments was $93,306, about $13,000 more than April but some $3,000 under the budget.

The major change was in hospital revenue which decreased almost $18,000 along with a decrease of $1,500 expense credits. A decrease of some $6,000 in gross hospital costs helped to decrease the hospital deficit some.

HEALTH & SAFETY SECTION

JUNE 1954

Industrial Medical Services

The total number of examinations increased from 935 to 1265. Dispensary visits decreased from 4725 to 4365. The number of visits for June, 1953, was 4271. Minor injuries (General Electric Plant and Community) increased slightly from 303 to 308. General Electric employees sustained two sub-major, but no major injuries. Contractor employees sustained no sub-major and no major injuries. Dispensary visits decreased in most areas but increased by 117 visits in the 700 Area dispensary. Nurses on the non-exempt roll numbered 26.

There was one information meeting for industrial physicians held during the month.

Four additional claims for hearing loss due to noise exposure were filed during the month making a total of five claims filed to date. About 160 ear plugs were fitted for workers in the 190 and 182 buildings where personnel hearing protection has been made mandatory.

Dr. Nesbitt, who has completed a one-year A.E.C. fellowship training course in Industrial Medicine, will complete his second year of in-plant training here beginning August 1st.

Two industrial physicians testified in Washington State Industrial Appeal Board hearings during the month.

The medical problems involved in supplying frozen food lunches for overtime workers are being considered and specifications for vendors and storage and heating of the food before consumption, are being prepared. The number of lunches supplied overtime workers each month plantwide becomes large and handling methods must eliminate possibilities for spoilage.

The Health Activities Committee met on June 17th and the monthly health topic dealing with elimination, for employee distribution, was presented. A new chairman of this committee, W. A. Shanks, was elected. The sickness absenteeism was 1.39% as compared to 1.62% for May.

Net costs for May amounted to $32,479, an increase of only $49 from the previous month. Minor fluctuations occurred within the categories of expense, but in general were offsetting upon each other. Expense credits, or charges to other departments, increased nearly $1,200 primarily as a result of services rendered to Community and Engineering personnel.

Costs-Operations

	May	April	Increase (Decrease)
Salaries	$30,200	$29,821	$ 379
Continuity of Service	3,020	2,982	38
Laundry	276	264	12
Utilities, Transportation, Maintenance	4,916	3,952	964
Supplies and Other	5,301	5,389	(88)
Total Gross Costs	43,713	42,408	1,305
Less: Revenue	1,460	1,383	77
Expense Credits	9,774	8,595	1,179
Net Cost of Operation	$32,479	$32,430	$ 49

Industrial Medical Services (Continued)
Costs-Operation (Continued)

Fiscal year to date costs are approximately $37,000, or 9% less than anticipated at the time the budget was prepared. The primary reason for the underrun is the greater than budgeted amount of service rendered other departments.

Industrial Medical Services (Continued)	May	June	Year to Date
Physical Examinations			
Operations			
Pre-employment	73	175	500
Rehire	27	53	173
Annual	161	115	1785
Interim	211	280	683
A.E.C.	29	47	195
Re-examination and recheck	204	282	1292
Termination	70	111	448
Sub-total	775	1063	5076
Contractors			
Annual	20	26	90
Pre-employment	84	91	426
Recheck	38	54	211
Termination and Transfer	18	31	118
Sub-total	160	202	845
Total Physical Examinations	935	1265	5921
Laboratory Examinations			
Clinical Laboratory			
Government	114	199	825
Pre-employment, Termination, Transfer	1623	2658	9430
Annual	902	708	9788
Recheck (Area)	1077	1243	3388
First Aid	2	1	64
Clinic	378	376	2413
Hospital	3792	3675	26334
Total	7888	8860	52242
X-Ray			
Government	13	19	98
Pre-employment, Termination, Transfer	219	348	1316
Annual	414	451	2725
First Aid	75	81	548
Clinic	205	185	1223
Hospital	277	269	1827
Public Health	6	1	47
Total	1209	1354	7784
Electrocardiographs			
Industrial	64	76	446
Clinic	2	3	8
Hospital	26	28	206
Total	92	107	660

HEALTH & SAFETY SECTION

JUNE 1954

Industrial Medical Services (Continued)	May	June	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	324	353	2080
Occupational Case Retreatments	1384	1376	7850
Non-occupational Treatments	2658	2251	15803
Sub-total	4366	3980	25733
Construction			
New Occupational Cases	78	76	393
Occupational Case Retreatments	242	248	1055
Non-occupational Treatments	39	61	303
Sub-total	359	385	1751
Facility Operators	0	0	149
Total First Aid Treatments	4725	4365	27633
Major Injuries			
General Electric	1	0	4
Contractors	0	0	0
Total	1	0	4
Sub-Major Injuries			
General Electric	4	2	15
Contractors	0	0	1
Total	4	2	16
Absenteeism Investigation			
Calls Made	1	1	29
Employee Personal Illness	1	1	21
No. absent due to illness in family	0	0	1
No. not at home when call was made	0	0	7

HEALTH & SAFETY SECTION

JUNE 1954

Kadlec Hospital

The average daily adult census decreased from 69.7 to 60.3 as compared to 74.0 a year ago. This represents an occupancy percentage of 55.3, broken down as follows: Mixed Service (Medical, Surgical and Pediatrics) 52.5; Obstetrical Service 67.1. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	28	59
Obstetrical Service	10	18
Total Adult	39	81

The average daily newborn census increased from 8.9 to 11.8 as compared to 13.2 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	5.21
Obstetrical	3.88
Newborn	3.05

The nursing hours shown for Medical, Surgical and Pediatrics is considerably higher than we usually provide. This results from the substantially decreased census over the past two months, even though there are less nursing personnel on the roll and a number of them are on vacation. Nursing hours per patient per day thus far in the calendar year 1954 are 3.92.

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of May was 2.37. When newborn infants are included, the ratio is 2.11.

The net expense for the operation of Kadlec Hospital for May was $25,159 as compared to $11,770 for April. Summary is as follows:

Kadlec Hospital net expense $25,159
This is an increase of a little more than $13,000. Gross costs actually decreased approximately $6,000, but were more than offset by almost $18,000 decrease in revenue and approximately $1,500 decrease in expense credits.

Mr. O. E. Bakko attended a meeting in Yakima of hospitals in this area to review a cost formula for possible use in connection with payments by the State Department of Health for the care of welfare patients.

Following is a summary of employee relations meetings held in the Health and Safety Section during June:

	Meetings	Attendance
Hospital	15	117
Industrial Medicine	4	16
Public Health	5	40
Safety & Fire Prevention	1	12
General	2	12
Total	27	197

JUNE 1954

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital			
Average Daily Adult Census	69.7	60.3	77.4
Medical	19.6	15.1	21.3
Surgical	26.8	20.0	31.7
Pediatrics	11.9	11.1	12.5
Mixed	58.3	46.2	65.5
Obstetrical	11.4	14.1	11.9
Average Daily Newborn Census	8.9	11.8	11.1
Maximum Daily Census:			
Mixed Services	77	59	99
Obstetrical	16	18	19
Total Adult Census	89	81	116
Minimum Daily Census:			
Mixed Services	33	28	28
Obstetrical Service	5	10	4
Total Adult Census	46	39	39
Admissions: Adults	504	513	3345
Discharges: Adults	542	504	3352
Medical	127	124	864
Surgical	239	184	1430
Pediatrics	94	89	537
Mixed	460	397	2831
Obstetrical	82	107	521
Newborn	72	94	467
Patient Days: Adult	2162	1810	14001
Medical	607	452	3847
Surgical	832	600	5731
Pediatrics	368	334	2269
Mixed	1807	1386	11847
Obstetrical	355	424	2154
Newborn	277	354	2007
Average Length of Stay: Adults	4.0	3.6	4.1
Medical	4.8	3.6	4.5
Surgical	3.5	3.3	4.0
Pediatrics	3.9	3.8	4.2
Mixed	3.9	3.5	4.2
Obstetrical	4.3	4.0	4.2
Newborn	3.8	3.8	4.3
Occupancy Percentage: Adults	63.9	55.3	71.0
Medical	53.0	40.8	57.6
Surgical	83.8	62.5	99.1
Pediatrics	62.6	58.4	65.8
Mixed	66.3	52.5	74.4
Obstetrical	54.3	67.1	56.7
Newborn	34.2	45.3	42.7

(Occupancy Percentage based on 109 adult beds and 26 bassinets.)

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital (Continued)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	4.20	5.21	
Obstetrics	4.27	3.88	
Newborn	4.03	3.05	
Avg. No. Employees per Patient (excluding newborn)	2.37		
Operations: Major	65	62	481
Minor	64	70	544
E.E.N.T.	63	64	420
Dental	0	0	10
Births: Live	75	94	463
Still	0	0	4
Deaths	6	5	32
Hospital Net Death Rate	.49%	.16%	.39%
Net Autopsy Rate	0	60.0	46.9
Discharged against advice	2	3	9
One Day Cases	152	164	933
Admission Sources:			
Richland	72.8	70.2	73.0
North Richland	13.1	11.9	12.6
Other	14.1	17.9	14.4
Admissions by Employment:			
General Electric	67.5	64.1	68.4
Government	2.9	2.9	3.1
Facility	6.8	7.0	5.1
Contractors	16.8	18.7	17.9
Schools	2.0	2.5	1.4
Others	4.0	4.8	4.1
Hospital Outpatients Treated-F.A.	473	465	3155
Recovery Bed Patients-F.A.	1	0	71
Physical Therapy Treatments			
Clinic	314	273	1967
Hospital	58	24	520
Industrial: Plant	174	192	1118
Total	546	489	3605
Pharmacy			
No. of Prescriptions Filled	2558	2562	35439
No. of Store Orders Filled	492	526	3088

Hospital Unit (Continued)	May	June	Year to Date
Kadlec Hospital (Continued)			
Patient Meals			
Regulars	3383	3017	21753
Children under 8	479	325	2530
Specials	1032	882	6824
Softs	738	553	5270
Tonsils	124	103	798
Liquids	154	99	1046
Surgical Liquids	86	104	521
Total	5996	5083	38742
Cafeteria Meals			
Noon	1746	1686	11011
Night	338	319	1861
Total	2084	2005	12872

HEALTH & SAFETY SECTION

JUNE 1954

Public Health Unit

Communicable diseases reported again declined sharply, bringing us to the lowest level so far this year. This was due chiefly to the lowered incidence of measles. Quantitatively, whooping cough and chickenpox are the two diseases most frequently reported. With the drop in communicable diseases, the home nursing visits made by the public health nurses were reduced accordingly. The nursing visits made in other categories remained at about the same level, the difference being chiefly vacation periods taken by some of the nurses.

Pre-school roundups were completed with the cooperation of the Pre-school P.T.A. and the Richland private doctors. Five hundred and ninety children were examined who will be entering school for the first time this year. We are in receipt of a letter of commendation for the fine program carried out in this phase of our work.

A meeting was attended by the health officer with Miss Lucille Lomen and Mr. Melvin G. Moss and a group of parents in order to discuss the handicap program in the community. Recommendation was made in terms of building additional facilities for handicapped children.

The health officer presented a paper for the Health Council in Honolulu, T.H., entitled, "Benefits of an Integrated Industrial and Public Health Program." About 150 persons, representing 40 different health agencies, Chamber of Commerce, etc. on the Island of Oahu, were present.

Mr. Russell Major, social service counselor from the State of Washington Division of Youth, visited with the social service workers. A routine visit was made to the department by Miss Julia Anderson, Assistant Professor, Public Health Nursing, University of Washington School of Nursing, regarding the field training for the student nurses.

Dr. Makins and Mr. Slick, representatives of the Red Cross Blood Program, visited here regarding the supply of whole blood to Kadlec Hospital for the use of Richland residents. Miss Catherine Vavra, Miss Marjorie Eastabrooks and Mr. Buell Reagan met with members of the unit in regard to the summer program for local school teachers.

Mr. Dan Prosser, mental health consultant, State Department of Health, Seattle, attended the meeting with the parents of handicapped children as a representative of the State Health Department. Miss Helen Cameron and Lillian O'Callahan held a workshop on communicable disease control with the nurses.

During June the social service counselors held 134 consultations with parents concerning problems with their children. In addition to discussions with parents there were 59 instances in which the difficulty was discussed directly with the children involved. Seventy-eight interviews were focused on the solutions of marital conflict, while special problems of adolescense were discussed with young people of this age group. Twenty-six adults were helped with handicapping personal problems.

There were also seven interviews during the month which focused on problems of mental or physical illness.

Public Health Unit (Continued)

Bacteriological results of samples taken from swimming and wading pool on a weekly basis have proved to be negative for coliform bacteria. Chlorine residuals have been adequately maintained.

Four citations were issued to residents for improper disposal of trash and garbage. Inadequate cleaning of dog pens resulted in citations for two residents.

The well located at Berlin Camp showed presence of coliform bacteria. It will be re-sterilized in the near future.

One restaurant was sold and permit issued to new owner. Sanitary inspection of other food handling establishments showed them to be operating satisfactorily.

Bacteria and coliform counts of pasteurized milk samples continued to be satisfactory. A milk sanitarians conference was held in Sunnyside regarding standardized inspections of pipe line milkers. Nineteen Grade A dairy farms were inspected.

Mosquito control operations consisted of spraying 1500 gallons of insecticide on areas where larvae were found to be present. Riverside Park is being misted with a residual spray on a weekly basis.

Residential areas have not as yet been fogged as the prevalence of adult mosquitoes has not as yet warranted its use. This may be necessary in the near future due to warmer weather.

HEALTH & SAFETY SECTION

JUNE 1954

Public Health (Continued)	May	June	Year to Date
Education			
Pamphlets distributed	10,999	12,016	77,181
News Releases	8	12	79
Staff Meetings	1	1	8
Classes	21	5	113
Attendance	82	84	3,038
Lectures and Talks	6	1	40
Attendance	110	35	1,980
Films Shown	23	5	81
Attendance	1,070	176	3,323
Community Conferences & Meetings	26	21	169
Radio Broadcasts	8	9	58
Immunizations			
Diphtheria	9	8	27
Diphtheria Booster	3	121	135
Tetanus	9	8	28
Tetanus Booster	3	121	134
Pertussis	9	8	26
Pertussis Booster	3	121	134
Smallpox	5	101	125
Smallpox Revaccination	4	97	478
Tuberculin Test	1	3	12
Immune Globulin	40	27	721
Other	0	0	4
Social Service			
Cases carried over	92	97	548
Cases admitted	20	17	111
Cases closed	15	13	96
Remaining case load	97	101	563
Activities:			
Home Visits	12	3	45
Office Interviews	341	334	1,921
Conferences	42	45	302
Meetings	6	8	45
Sanitation			
Inspections made	123	127	795
Conferences held	11	6	94
Bacteriological Laboratory			
Treated Water Samples	173	238	1,157
Milk Samples (Inc. cream & ice cream)	36	32	237
Other bacteriological tests	567	557	3,600
Total	776	827	4,994

HEALTH & SAFETY SECTION

JUNE 1954

Public Health (Continued)	May	June	Year to Date
Communicable Diseases			
Chickenpox	58	33	254
German Measles	3	3	34
Impetigo	0	0	3
Influenza (U.R.I.)	2	0	4
Infectious Mononucleosis	0	0	1
Infectious Hepatitis	1	4	8
Measles	78	21	1,359
Mumps	5	3	21
Pinkeye	4	0	6
Ringworm	0	0	6
Roseola	2	0	5
Scabies	0	0	1
Scarlet Fever	6	6	60
Streptococcal Infections-Throat	0	0	3
Tuberculosis	0	0	1
Whooping Cough	23	13	57
Total	182	83	1,823
Total No. Nursing Field Visits	758	364	4,177
Total No. Nursing Office Visits	111	56	663

COMMUNITY OPERATIONS SECTION

ORGANIZATION & PERSONNEL

JUNE 1954

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
ADMINISTRATION	1	1	1	1
ELECTRICAL	5	15	5	15
PUBLIC WORKS	10	67	10	76
RECREATION & CIVIC AFFAIRS	3	2 1/2	3	4
LIBRARY	4	8	4	8
POLICE	17	33	17	30
FIRE	67	0	66	0
ENGINEERING	6	3	6	3
	113	129 1/2	112	137

COMMUNITY OPERATIONS SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
JUNE 1954

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees Beginning of Month	5	15
Transfers In	0	0
Transfers Out	0	0
Terminations	0	0
Total End of Month	5	15

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	4
Anchors set and guys installed	1
Street lights repaired and steel mast arms installed	6
Street lights relamped - Mercury Vapor	4
Street lights relamped - 6000L and 4000L, 1100 Area	104
Street lights relamped - 6000L and 4000L, 700 Area	8
Flood lights relamped, 1100 Area	2
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	3
Primary line footage added	0
Primary line footage removed	0
Transformer KVA added	225
Transformer KVA removed	122.5
Net transformer KVA installed	103.5
New services installed - residential	0
New services installed - commercial	4
Temporary services installed and removed	2
Scheduled outages - primary	3
Scheduled outages - secondary	3
Unscheduled outages - primary	0
Unscheduled outages - secondary	0
Standby and escort	2
High voltage tree trimming	21
Low voltage tree trimming	10

TRAFFIC SIGNALS

Relamping	151
Operational failures	0
Installations	1
Removals	0

RICHLAND ELECTRICAL UNIT

Routine maintenance checks	43
Routine check R.R. signal at Van Giesen	4
Total signals in operation - automatic	18
Total signals in operation - manual	3
Total signals in operation - flasher	1

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	30
Electrical motors checked and serviced - water	94
Electrical motors checked and serviced - sewage	22

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	4
Outside circuit checks	6
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	5
Main feeder and tie breaker checks - BB1S2	5
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	21

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Radio interference checks	3
Voltage and load checks	3
Meters tested - customers' requests	4
New meters shop tested	28
Faulty meters replaced	3
Damaged meters and covers	10
Residential read-ins	190
Residential read-outs	195
Residential disconnects	0
Residential reconnects	0
Meters resealed	3
Meters changed out due to excessive load	0
Faulty meters tested and repaired	12
Residential services and meters removed	10

Consumption and revenue: (Est.)

	No. of Meters	KWH	Revenue
Residential - Schedule 1	7005	4,200,000	$43,000.00
Commercial - Schedule 2	367	2,800,000	24,000.00
Totals	7372	7,000,000	$67,000.00

RICHLAND ELECTRICAL UNIT

COMMENTS

Connected 13 TV amplifiers to electrical system.

Disconnected fire alarm system to Lewis and Clark School system six times during month to permit new tests to current installation by AEC and contractors. Also on one occasion to Marcus and Whitman School system.

Completed service repairs to fire alarm boxes Nos. 353 at Potter and Torbett, 4222 and 553.

Removed services and meters at nine locations: 509 Thayer, Sacajawea huts, Safeway Store contractor, 208 Abbot, 1204 Smith, school maintenance building at Lee and railroad crossing, 416 Snow, 401 Thayer, and 1005 Snow.

Service repairs were made to: entrance head at 1320 Tunis, repaired service drop at 905 Cedar, loose connections to circuit fed by transformer #4430 at 2109 Duportail, blown fuse to 480 volt transformer at Richland Concrete - caused by contractors wiring - cost was backcharged to the operator.

Connected service to: Desert Riders and Ropers Club on west Van Giesen, Richland Baptist Church at Wordrop and GW Way, meter loop and meter to Sewer Lift pump at Wellsian Way and Bypass Highway.

Electrical repairs were made to Sewage System as follows: completed overhaul and re-installation to three 5 HP digester motors at Treatment Plant, repaired shorted switch to Detroiter motor at #1 Plant, installed gaskets to outside conduit runs at Treatment to exclude water.

Electrical repairs to Water System as follows: North Richland Well Field, disconnected motor to Well D, previously down for pump repairs; replaced two bearings to Well C (75 HP motor); disconnected and reconnected Wells K and C for pump repairs, well C was reconnected on Call-out requested by Mr. Goggin on 6-12-54 from 12:45 to 4:00 p.m. for one man from electrical; removed defective bearing to 200 HP Well F, re-installed on 6-22-54 after emergency procurement; replaced bearing and retainer collar to #2 motor in #5 irrigation station; repaired and adjusted all automatic controls in all irrigation stations.

New Transformer Station was installed and net kva was increased as follows: To supply new load at 713 Building - installed two 100 kva and one 25 kva - removed one 75 kva and one 37.5 kva - some new secondary circuit was installed to effect the change.

Distribution transformer #1299 was checked for loose connections account of radio interference, but found inoffensive.

Planned secondary and primary outages as follows: To substation D1-S25 Uptown Commercial Area, was out for short period to raise transformer voltage taps to compensate for heavy loads. Checked for loose connections at Transformer #1299, #4430, Line 34 to increase wire size to serve Central Transportation Area, Barth and Falley to increase primary wire size, Line 22

at Cullum and Benham to increase wire size.

Street lighting improvements: Replaced six defective wood mast arms with steel and rewired fixtures and lamps on Gillespie from Duane to GW Way. Rewired photo-cell and controller to Yakima Bridge lighting to conform to other installations to permit adequate maintenance. Completed three mercury vapor light installations. Adjusted time clock at Columbia Playfield to shut off at 10:15 p.m.

Traffic signal improvements: Rewired and adjusted signals at Van Giesen and Bypass to provide joint traffic protection from railroad activities as requested by Police Department. Added radio interference eliminators to signal at GW Way and Van Giesen account of contact noises. Installed new traffic signal at Jadwin and Symons. Installed new vehicle switch to traffic signal at GW Way and Van Giesen, replacing defective one recently installed. Relocated position of new one to allow for widening of intersection.

Radio interference checks and adjustments: Corrected interference in traffic controller unit at GW Way and Van Giesen. Corrected interference in 1200 street light circuit.

Installed 5700 ft. of tree wire to aerial fire alarm circuits as directed by the Fire Dept.

Cleaned and reset meters in McVickers Building after interior fire.

Removed unused switches and poles and wires across Sacajawea School grounds.

Repaired guy wire and installed barricades to damaged anchor at Van Giesen and Bypass where hit by auto that ran off right-of-way. Car not apprehended.

Removed unnecessary guy stub, anchor and overhead guy at corner of Guthrie and Gribble that was in way of street extension.

Provided transportation for two escorts for heavy and high loads during month.

Call-out 6-12-54 - one man from 12:45 to 4:00 p.m. to reconnect Well C pump motor, requested by J. R. Goggin.

Hold-over 6-22-54 - one man to adjust phase relay at WEll F - .6 hr.
One man to connect and place Well L in operation - 2 hrs.
Two men to connect Well K - .4 hr.

COMMUNITY OPERATIONS SECTION
PUBLIC WORKS UNIT
MONTHLY REPORT
JUNE 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	10	67
Transfers Out	--	1
Transfers In	--	--
New Employees	--	10
Reactivated	--	--
Terminations	--	--
Total End of Month	10	76

SANITATION

Total weight of garbage and trash collected during June was 1301 tons. Some difficulty was encountered in disposal operations due to seepage of water into the pit during high water level in the Columbia River. It was necessary that extreme caution be used to prevent bogging down of equipment, and fill material had to be hauled a greater distance.

ROADS AND STREETS

Seal-coating of seven miles of streets was completed.

The first course of a double course penetration surfacing was applied to the parking lots at W-20 and the Community House, and the second course will be applied when the oils have cured out.

Paving of McMurray Road, from George Washington Way to Jadwin, was completed by an AEC contractor on 5-28-54, and this work completes a project which included installation of concrete curb and gutter, a storm sewer, and grading and paving of the street.

Grade of the gutter line on the east side of the 1400 block on Johnson Avenue was lowered to improve drainage, and this new gutter was surfaced.

Surfacing at the intersection of Williams and Kimball, which was deteriorated and poorly graded, was removed and replaced with pre-mix laid at a proper grade.

Repairs to the Elgin street sweeper which has been out of service since early May are now complete, and the sweeping of streets per schedule will now be continued.

Routine seasonal maintenance and repair of streets, street signs, drainage systems, municipal sidewalks and parking lots were continued.

PARKS AND PUBLIC GROUNDS

The major part of lawn irrigation was assigned to graveyard shift as of 6-7-54. Irrigation that might disturb residents during the night time is being done during the day.

The purchase order for 650 quick-coupler (snap-on) valves and sprinklers, as replacements for a like number of unsatisfactory pop-up type rotary sprinklers, has been placed and delivery is promised during late July. Installation will follow as work load permits.

Routine maintenance of parks buildings, equipment and grounds; shelter belt areas; and public grounds was continued.

DOMESTIC WATER

On June 7 the south half of 3000 Area percolation basin was worked to remove silt accumulation from the surface. This was done by blading the surface material carrying the silt deposit into windrows. Water was returned to this basin on June 7 and the water table in the wells surrounding the basin has recovered satisfactorily.

The services of the Strasser Well Drilling Company were procured in an attempt to improve the water supply available to the pumps in the newly drilled and equipped wells at the 3000 Area. By test pumping these wells during the month of May, it was found that insufficient water was getting into the well casing to permit pumping at the rate as shown in the original drilling and testing and for which the pump capacities were designed. It was felt that some development work might improve this condition. Under Strasser's direction, the pump was removed from K-Well and air lines installed in an attempt to develop this well by pumping with compressed air. The well was pumped with air for five and one-half hours and then back flushed with system pressure. The pump was then reinstalled and the well test pumped. Indications at first were that the developing had improved the well considerably, but after checking other wells in the area it was found that concurrently with the developing work on this well the underground water table in the general area had improved, and the capacities of the other wells that had not been worked had increased as much or more than the K-Well. As a result of this finding further development work was not recommended.

The 3000-D well pump was reinstalled and put in service. 3000-C well was pulled, overhauled, and returned to service during the month. The top motor bearing in 3000-F well failed on 6-17-54. A replacement bearing was obtained on an emergency order and the well was returned to service on 6-22-54. On 6-23-54, 3000-L well pump was reinstalled and returned to service.

Several minor water line leaks were repaired during the month.

On 6-25-54, the river pump at Columbia Field was put in service to supply water to the recharge basin as sufficient water was not available from the irrigation canal system.

DOMESTIC WATER

	Well Production Million Gallons	Average Daily Production	Total Consumption Million Gallons	Av. Daily Consump.
Richland	136.4200	4.5473	532.5027	17.7500
North Richland	399.5950	13.3198	56.9378	1.8979
Columbia Field	99.8342	3.3278		
300 Area			45.5012	1.5167
TOTAL	635.8492	21.1949	634.9417	21.1646

Maximum daily consumption was 30,666,500 gallons on June 29, 1954.

SEWERAGE SYSTEM

Normal operations were continued throughout the month. 135,000 gallons of sludge was pumped to the drying beds. The mixers are still out of #2 Treatment Plant primary digestor awaiting delivery of repair parts.

SEWAGE

	Total Flow Million Gallons	Average Daily Flow Million Gallons
Plant No. 1	33.280	1.109
Plant No. 2	71.114	2.370
TOTAL	104.394	3.479

IRRIGATION SYSTEM

On June 22 the irrigation canal system was treated with 25 barrels of weed killer to clear the canal of aquatic weeds that had reduced the canal flow to a point that insufficient water was available for recharge and irrigation systems. The treatment was very effective and the canal flow increased immediately.

COMMUNITY OPERATIONS SECTION
RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
JUNE 1954

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	2-1/2
New Hires	0	2
Terminations	0	1/2
Transfers - In	0	0
Transfers - Out	0	0
End of Month	3	4

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of June 30, 1954:-

Administration	7
Principals and Supervisors	14
Clerical	24
Teachers	304
Health Audiometer	0
Cooks	41
Bus Drivers	1
Maintenance	20
Operations	46
	457

CLUBS AND ORGANIZATIONS

As of June 30, 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

RECREATION AND CIVIC AFFAIRS UNIT JUNE 1954

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business, Professional, Service, & Governmental		18
Churches and Church Organizations		31
Civic Organizations		7
Schools, P.T.A., and Alumni Groups		25
Fraternal Organizations		25
Political Organizations		7
Recreation and Social Clubs -	Arts, Crafts & Hobbies	8
	Dramatics	1
	Dance	6
	Nature & Outing	7
	Music	8
	Social	13
	Sports	19
Veteran and Military Organizations		14
Welfare Groups		11
Youth -	Boy Scouts	20
	Girl Scouts	49
	Campfire Girls	36
	Miscellaneous	16
		321

RECREATION

The regular meeting of the Parks and Recreation Board was held on June 3, 1954. The Board was advised that the Lutheran Church re-located the play equipment at Stevens playground on May 22, and that trees would be planted in the new area in November.

The next regular meeting of the Board is scheduled for July 20, 1954.

The summer recreational program sponsored by the Unit, began on June 8th., and is to operate thru August 21st., with play-leader assigned to direct activities at Riverside Park and Columbia Playfield. The summer program is to include Dramatics, Tumbling, Story Telling, and the Community Band concerts.

Attendance Statistics - June, 1954

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
A. Community House					
I. Rec. Unit Supervised Programs					
Games Room Activities	26	2 139	341		2 480
II. Affiliated Programs					
Hi-Spot Club (Teen Age)	5	1 812	26		1 838
Rec-A-Teers (Young Adults)	1		35		35
Fencing	1		2		2
Int'l. Folk Dancers	5	5	83		88
Rich. Rod & Gun Club	1	25	115		140
Y.W.C.A. Supper Club	2		44		44
Jr. Sportsman Club	2	16	4		20
Allied Arts Assn.	1		5		5
III. Rec. Unit Special Events					
None					
IV. Non-Unit Special Events					
None					
V. Other Comm. House Bookings	20	65	403		468
Sub-Totals	64	4 062	1 058		5 120
B. Parks and Playgrounds					
I. Rec. Unit Supervised Programs					
Juvenile Fishing	30	380	120		500
General Play-Riverside	30	3 000	2 068		5 068
General Play-Columbia	30	527	464		991
Play-For-Fun League	3	256	24	116	396
Triple-O-League	5		480	185	665
Dramatics - Riverside	5	128	5		133
Story-Telling-Riverside	3	223	3		226
Tumbling - Riverside	6	62	6		68
Wading Pool - Riverside	30	950			950
II. Affiliated Programs					
Tennis Clinic	2		16		16
Jr. Baseball League	14	420		700	1 120
Amer. Little League (Jeff)	18	540	144	1 425	2 109
Jr. Softball League	15	450	60	600	1 110
Rich. Softball Assn.	26		1 200	1 691	2 891
Lakeshore League	3		60	150	210

RECREATION AND CIVIC AFFAIRS UNIT — JUNE, 1954

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
III. Rec. Unit Special Events					
Community Band Concert	1		30	400	430
Baseball Pitch Contest	1	22	2		24
IV. Non-Unit Special Events					
None					
V. Baseball & Softball Bookings					
All Fields	260	4 220	932		5 152
VI. Estimated Use of Non-Supervised Playgrounds					
Neighborhood Playgrounds	30	8 100	2 190	____	10 290
Sub-Totals	512	19 278	7 804	5 267	32 349

SUMMARY OF STATISTICS

	No. of Sessions	Youth	Adults	Spectators	Sub-Total
Community House	64	4 062	1 058	-0-	5 120
Parks & Playgrounds	512	19 278	7 804	5 267	32 349
Total June Attendance	576	23 340	8 862	5 267	37 469

Grand Total for June 37 469
Cal. Year Total To Date 149,497

COMMUNITY OPERATIONS SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
June 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	22,355
Magazines	440
Pamphlets	63
Records	1,006
Inter-Library Loans	28
Grand Total	23,892

Current Book Stock

Books added this month	653
Books withdrawn this month	0
Grand Total	30,614

Registration

Adult	253
Juvenil	314
Total	567
Total Registered Borrowers	16,761
Children's Story Hour Attendance	190
Meetings in North Hall	17

The total registration for the children's summer reading program "Build Your House in Bookland, Washington" is 583. Of this number, 222 children have reported on at least one book, 47 have finished five books and 5 have completed the required ten books to become winners in this year's reading club.

Drapes were installed in the North Hall of the Library this month. This makes it possible to use the room to show films and slides without the use of paper over the windows as has been used in the past.

The librarian attended the annual conference of the American Library Association Conference held in Minneapolis, Minnesota, June 20 through June 26, 1954.

COMMUNITY OPERATIONS SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
JUNE 1954

ORGANIZATION	Exempt	Non-Exempt
Employees - Beginning of Month	17	33
Transfers In	0	0
Transfers Out	0	2
New Hires	0	0
Terminations	0	1
Total - End of Month	17	30

GENERAL

We received notification this month that Richland has been awarded a special citation for "superior pedestrian protection efforts" in the 15th annual American Automobile Association's Pedestrian Protection Contest. This award was made on the basis of general activities in connection with Richland's pedestrian protection program.

We also were notified this month that this department received an honorable mention award in the International Association of Chiefs of Police Traffic Law Enforcement competition for 1953, for outstanding law enforcement. Enforcement sections of the Annual Inventory of Traffic Safety Activities were considered in the judging for this award.

Lt. E. E. Miller and Capt. C. F. Kleppe: attended the South Central Washington Safety Conference held in Yakima on June 1.

On June 23, Sgt. T. J. McGuire, of this department, made a talk before a group of Boy Scouts which covered the following subjects: The Police Department and the youth of the community; explanation of how the Police Athletic League functions and its purpose; respect for other peoples' property; and the danger of petty thefts.

A new three phase traffic signal light was installed this month at the intersection of Jadwin and Symons. A new actuating pedal for the traffic light at Van Giesen and George Washington Way was received and has been installed at this location, making it possible for this light to again be operated on an actuated basis.

New radio equipment was installed in 12 police automobiles this month. This was necessary in order to make a change-over to a new frequency so that community equipment could be operated on a single frequency separately from the plant facilities. Accordingly, the plant radio transmitter and station formerly utilized by the police on the old frequency will be discontinued prior to July 1. New call letters have been assigned to the Richland Police radio station and are KGB 513, Station 5.

Three new police vehicles were obtained during June and have been placed in operation. Also, three vehicles have been equipped with shield-shaped decals on the doors of the vehicles, reading "Police, City of Richland".

A new bicycle rack has been installed near the Richland Jail which will accomodate approximately 24 bicycles.

TRAFFIC

	1954 May	1954 June	1953 May	1953 June	1954 Total To Date	1953 Total Same Period
Reportable accidents	20	11	18	23	122	133
Property damage accidents	16	10	12	19	106	114
Injury accidents	4	1	6	4	16	18
Total persons injured	4	1	12	5	16	26
Fatal accidents	0	0	0	0	0	1
Accidents-Daylight hours	16	11	14	20	85	89
Darkness	4	0	4	3	37	44
Accidents-Business dist.	5	3	6	8	33	51
Residential "	11	7	7	9	71	62
Other "	4	1	5	6	18	20
Accidents investigated	13	9	13	16	72	87
Criminal complaints filed	9	9	12	13	52	70
Violations contributing to accidents:						
Negligent driving	2	2	3	2	23	19
Fail.to yield r.o.w.	8	7	5	9	33	48
Following too closely	2	1	2	4	23	21
Drunk driving	1	0	0	2	2	3
Pedestrian violation	3	0	1	0	3	3
Inattention to driving	0	0	0	0	0	1
Reckless driving	0	0	1	0	3	4
Speeding	0	0	0	1	1	3
Unsafe speed	1	0	2	2	20	7
Improper backing	2	1	3	1	7	10
Disregarding stop sign	0	0	1	0	0	4
Hit and run	0	0	0	0	0	1
Improper passing	0	0	0	0	0	2
Improper turn	0	0	0	2	1	2
Failure to signal	0	0	0	0	1	0
Wide right turn	0	0	0	0	1	0
Wrong side of road	0	0	0	0	0	0
Defective equipment	0	0	0	0	0	0
Bicycle violation	1	0	0	0	2	0
North Richland:						
Reportable accidents	8	6	8	13	48	55
Property damage accidents	5	6	4	11	40	45
Injury accidents	3	0	4	2	8	10

Richland	1954 May	1954 June	1954 Ave.Per Accident May	1954 Ave.Per Accident June	1953 Ave.Per Accident May	1953 Ave.Per Accident June
Accident property damage	$3520.00	$2092.00	$176.00	$190.19	$345.98	$220.22

TRAINING

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction was as follows:

38 Caliber Revolver ½ Hour
Total number of men reporting at the range 17
Number of men fired over the Army-L Course 17

Qualifications on the Army-L Course as follows:

Sharpshooter	6	35%	Expert	2	12%
Marksman	7	41%	Unqualified	2	12%

ACTIVITIES AND SERVICES	May		June	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	6	6	7	7
Bicycles impounded	7	0	4	1
Bicycle violations	0	0	0	0
Bicycles registered	48	0	127	0
Children lost or found	17	2	10	1
Complaints investigated (no enforcement action)	44	11	31	2
Deaths reported	0	0	0	0
Dog, cat, loose stock complaints	7	0	9	0
Dogs, cats, reported lost or found	10	1	6	4
Doors, windows found open in facilities	46	9	33	4
Emergency messages delivered	13	102	16	103
Fires investigated	9	2	10	2
Guns registered	3	0	4	0
Law enforcement agencies assisted	5	0	1	0
Letters of inquiry	71	0	112	0
Miscellaneous escorts	7	3	5	4
Persons injured by dogs	3	0	0	0
Plant departments assisted	15	2	21	2
Prisoners processed through Jail	19*	18	21**	17
Private individuals assisted	19	2	18	4
Property lost or found	20	5	16	6
Records inquiries	105	0	95	0
Reports processed through Records	223	185	250	149
Street lights out reported to Electrical	93	27	107	22
Traffic safety meetings (June attendance - 150)	10	0	5	0
Total	800	375	908	328

*Two prisoners handled for Security Patrol

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
JUNE 1954

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST -	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART I								
1. Criminal Homicide								
a. Murder & Non-Neg. Mans.								
b. Mans. by Negligence								
2. Rape								
3. Robbery	-	2	-	1	-	-	-	1
4. Aggravated Assault	1	-	-	-	1	-	-	-
5. Burg.-Break. & Entry	2	-	-	-	-	-	8**	-
6. Larceny Over $50.00	1	3	-	-	-	-	-	1
Under $50.00	15	13	-	-	3	1	2	-
7. Auto Theft	-	4	-	1	-	1	-	1
TOTAL PART I CASES	19	22	-	2	4	2	10	3
PART II								
8. Other Assaults	3	3	-	-	-	-	3	3
9. Forgery & Counterfeit	5	-	-	-	-	-	11**	-
10. Embezzlement & Fraud	3	-	-	-	-	-	2	-
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons:Carry:Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	1	-	-	-	-	-	1	-
15. Offenses Ag.Fam.& Child	-	-	-	-	-	-	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	10	7	-	-	-	-	10	7
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	2	-	-	-	-	-	2	-
21. Gambling	-	3	-	-	-	-	-	3
22. Driving While Intoxicated	8	6	-	-	-	-	8	6
23. Viol. Rd. & Dr. Laws:								
Fail. to Stop & Identify	2	3	-	-	-	-	2	3
Speeding	26	7	-	-	-	-	26	7
Stop Sign	13	5	-	-	-	-	13	5

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART II								
Reckless Driving	4	1	-	-	-	-	4	1
Right of Way	6	2	-	-	-	-	6	2
Negligent Driving	21	11	-	-	-	-	21	11
Defective Equipment	1	2	-	-	-	2	1	-
Illegal Passing	2	3	-	-	-	-	2	3
24. Parking	12	42	-	-	3	2	9	40
25. All Other Traffic Viol.	23	7	-	-	-	-	23	7
26. All Other Offenses:								
Malicious Mischief	-	-	-	-	-	-	-	-
Vandalism	2	-	-	-	-	-	-	-
Bike Violations	4	1	-	-	4	1	-	-
Family Disturbance	-	-	-	-	-	-	-	-
Public Nuisance	4	2	-	-	-	-	4	2
Investigation	5	3	-	-	3	3	-	-
Prowler	5	11	-	-	-	-	-	-
Disturbance	1	1	-	-	-	-	1	1
Molesting	1	-	-	-	-	-	-	-
Dog Disturbance	1	-	-	-	1	-	-	-
Viol. of Dog Ordinance	1	-	-	-	-	-	1	-
Arson	1	-	-	-	1	-	-	-
Damage to Property	4	-	-	-	2	-	-	-
Filiation	1	-	-	-	-	-	1	-
Drinking in Public	-	2	-	-	-	-	-	-2
27. Suspicion								
TOTAL PART II	172	122	-	-	15	8	151	103
PART III								
28. Missing Persons	6	3	-	1	5	2	-	-
Lost Persons	13	-	-	-	13	-	-	-
Lost Animals	3	1	-	-	-	-	-	-
Lost Property	43	6	-	-	20	2	-	-
29. Found Persons	-	-	-	-	-	-	-	-
Found Animals	3	1	-	-	-	-	-	-
Found Property	37	1	-	-	26	-	-	-
TOTAL PART III	105	12	-	1	64	4	-	-

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.	1	-						
32. Prop.Dam.M.V.Acc.	10	6						
33. Other Traffic Acc.								
34. Public Accidents)								
35. Home Accidents)	No Accurate Statistics Kept							
36. Occupational Acc.)								
37. Firearms Accidents								
38. Dog Bites								
39. Suicides								
40. Suicide Attempts								
41. Sud. Death & Bod. Found								
42. Sick Cared For								
43. Mental Cases	1							
TOTAL PART IV	12	6						
COMPOSITE TOTALS								
PART I,II,III,IV CASES	308	162	-	3	83	14	161	106

*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. ** Four Burglaries cleared for previous months, and two burglaries cleared for previous year. ** Six Forgeries cleared for previous year.

G8-20

Property reported stolen	Richland	$1,312.96
Property reported stolen	No. Rich.	$3,014.00
Property recovered	Richland	$1,167.22
Property recovered	No. Rich.	$2,030.00

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore. & Calif. Six Months (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 May	1954 June
Murder	.383	.064	-	-	-
Robbery	11.925	1.988	-	-	-
Agg. Assault	9.95	1.659	-	-	1
Burglary	73.55	12.259	19	1	2
Larceny	210.53	35.089	116	15	16
Auto Theft	39.23	6.538	4	-	-

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural dis

State of Washington Six Months (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 May	1954 June
Murder	.371	.062	-	-	-
Robbery	8.43	1.403	-	-	-
Agg. Assault	2.03	.338	-	-	1
Burglary	62.28	10.38	19	1	2
Larceny	188.38	31.397	116	15	16
Auto Theft	34.0	5.667	4	-	-

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953 Jan. - June	Richland 1954 May	June
Robbery	-	-	-
Burglary	28%	-	100%
Larceny	16%	7%	19%
Auto Theft	17%	-	-

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF NORTH RICHLAND)

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

Wash.Ore. & Calif. Six Months (Jan.-June 1953)		One Month Average	1953 Jan. - June	1954 May	1954 June
Murder	.153	.026	-	-	-
Robbery	4.77	.795	-	-	2
Agg. Assault	3.98	.663	1	-	-
Burglary	29.42	4.903	4	-	-
Larceny	84.21	14.035	52	10	16
Auto Theft	15.69	2.615	5	-	4

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 May	1954 June
Murder	.153	.026	-	-	-
Robbery	3.37	.562	-	-	2
Agg. Assault	.81	.135	1	-	-
Burglary	24.91	4.152	4	-	-
Larceny	75.35	12.588	52	10	16
Auto Theft	13.60	2.267	5	-	4

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland 1953 Jan. - June	No. Richland 1954 May	No. Richland 1954 June
Robbery	-	-	50%
Burglary	-	-	-
Larceny	12%	10%	6%
Auto Theft	9%	-	25%

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

MONTHLY REPORT — RICHLAND POLICE DEPARTMENT — JUVENILES INVOLVED — JUNE

OFFENSES	NO. CASES	JUVENILES	SEX	7	9	11	14	15	16	17
RICHLAND										
Larceny	2	5	M			2		1	2	
Damage to Property	2	1	M						1	
		1	F				1			
Attempted Molesting	1	2	M							2
Arson	1	4	M		2	2				
Burglary	1	1	M							1
TOTALS	7	14			2	4	1	1	3	3
NORTH RICHLAND										
Fire Investigation	1	1	M	1						
TOTALS	1	1		1						

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
JUNE 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										$	$ 5.00	$
DISREGARD BARRICADE	8	6	1	1								5.00	30.00	5.00
DRUNK DRIVING	8	7		1			2		7				337.50	
F.T.S. & I.	3	2	1									100.00	40.00	
F.T.Y.R.O.W.	11	4	6		1					1		150.00	55.00	10.00
F.T. OBEY SIGN	1	1											5.00	
FOLLOW TOO CLOSE	1		1									25.00		
ILLEGAL PARKING	10	1	5	3	1							17.50	3.50	3.50
ILLEGAL PASSING	2	1	1									7.50	5.00	
ILLEGAL TURN	1	1											10.00	
ILL. USE OF SPOTLIGHT	1	1											10.00	
INVALID DRIVERS LICENSE	19	9	6	2	1	1				1		33.50	48.50	5.00
INVALID LICENSE PLATES	2	1	1									25.00	10.00	
NEGLIGENT DRIVING	21	14	5	2								125.00	237.50	
NO REGISTRATION	2	2											10.00	
PERMIT UNLIC. OPER. TO DRIVE	1	1											10.00	
RECKLESS DRIVING	3	2		1					2				90.00	
SPEEDING	25	8	15		1	1						157.50	62.50	10.00
STOP SIGN	17	9	7	1						1		60.00	80.00	
DOG ORDINANCE	1			1										
FRAUD	1	1											12.50	10.00
PUBLIC INTOXICATION	11	3	8									102.50	37.50	
PUBLIC NUISANCE	6		3		3							55.00		
RESISTING ARREST	2	2					1						10.00	
THIRD DEG. ASSAULT	4	4					1	1		1			67.50	12.50
VAGRANCY	1	1					1							
TOTAL	163	82	60	12	7	2	5	1	9	4		$863.50	$1177.00	$56.00

ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
JUNE 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
DRUNK DRIVING	4	3			1		1		3			$	$130.00	$
F.T.S. & I.	1				1									
F.T.Y.R.O.W.	4	1	3							1		57.50	7.50	
FOLLOW TOO CLOSE	1	1											15.00	
FOUR IN FRONT SEAT	1	1											5.00	
ILLEGAL PARKING	51	6	22	23								80.50	21.00	10.5(
ILLEGAL PASSING	4	2	2									25.00	15.00	7.5(
ILL. USE OF 1 WAY ST.	1		1									7.50		
INVALID DRIVERS LICENSE	10	7	2	1						1		25.00	37.50	5.0(
INVALID LICENSE PLATES	2	1		1									12.50	
LEFT VEHICLE WITH MOTOR RUNNING	2		2									12.50		
NEGLIGENT DRIVING	13	7	5		1					1		180.00	147.50	
NO REGISTRATION	1	1											10.00	
RECKLESS DRIVING	2	2							2				72.50	
SPEEDING	10	8	2							2		47.50	67.50	
STOP SIGN	8	4	4							1		30.00	25.00	10.0(
GAMBLING	3	3											112.50	
PUBLIC INTOXICATION	10	5	5				2					62.50	35.00	
PUBLIC NUISANCE	2	1	1				1					25.00		
DISTURB THE PEACE	1	1											12.50	10.0(
THIRD DEG. ASSAULT	3	3					2	1					17.50	
VAGRANCY	1	1					1							
TOTAL	135	58	49	25	3		7	1	5	6		$553.00	$743.50	$43.0(

ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.
ONE RECKLESS DRIVING CASE AMENDED TO F.T.Y.R.O.W.
ONE DRUNK DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
JUNE - 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	May	June	May	June	May	June	May	June
Richland	20	11	0	0	0	0	4	1
No Richland	8	6	0	0	0	0	3	0

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken		Other Causes	
	May	June	May	June	May	June	May	June
Richland	2	2	8	7	1	0	9	2
North Richland	3	2	1	0	1	0	3	4

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	May	June	May	June	May	June	May	June	May	June	May	June	May	June
Richland	0	0	0	0	0	3	0	0	0	0	1	0	1	3
No. Richland	0	0	0	0	6	2	0	0	0	2	0	0	6	4

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	
	May	June	May	June	May	June	May	June	May	June	May	June	May	June	May	June	May	June
Richland	19	25	12	16	4	8	4	4	7	10	14	20	14	10	39	41	113	134
No. Rich.	6	8	9	7	0	5	6	2	5	3	7	11	77	51	26	22	136	109

TRAFFIC VOLUME COUNT: 24 Hour Traffic Volume Count on Stevens Drive north of Lee for the week ending June 25, 1954; 5,930 vehicles.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY

COMMUNITY OPERATIONS SECTION
RICHLAND FIRE DEPARTMENT
MONTHLY REPORT
JUNE 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	1	0
Employees - End of Month	66	0

Fire Protection

		Richland	North Richland
Fire Loss (Estimated):	Government	$ 276.00	$ 0.00
	Personal	5523.64	135.00
	June Total	$5799.64	$ 135.00
	Year's Total	$9162.64	$4146.00
Response to Fire Alarms		30	23
Investigation of Minor Fires & Incidents		2	0
Ambulance Responses		36	0
Inside Schools or Drills		33	6
Outside Drills		23	14
Safety Meetings		8	2
Security Meetings		4	2
Fire Alarm Boxes Tested		209	112

The Fire Department provided artificial respiration instructors for five groups totalling 77 employees.

On June 11, Chief Quane and two firemen responded to Kennewick's call for assistance on major ammonia break in Welch Plant.

The Fire Department participated in the June 14 Civil Defense practice alert by dispersing apparatus.

Two 750 gallon-per-minute pumpers, received from Savannah River Plant, were turned over to an Oregon fire apparatus concern for remodelling.

Visitors to the Central Fire Station during June included nine Cub Scouts and 24 pre-school children with four adults.

Captain R. W. Hatfield attended the June 16 class in Effective Human Relations.

Fire hose pressure-tested in June totalled 2450 feet of $2\frac{1}{2}$ inch and 200 feet of $1\frac{1}{2}$ inch.

Richland Fire Department

Fire apparatus stood by at the Atomic Energy Commission Airport on June 30 for the landing and take-off of an Army hospital plane.

Fire Prevention

There were 285 Richland and 116 North Richland fire inspections conducted in June, resulting in 35 hazard reports. Six hundred and eleven fire extinguishers were inspected, 16 required replacement, 20 were installed, 22 recharged, 12 repaired, and 11 relocated.

Investigated fire at Hanna's Malt Shop caused by short in non-code conforming neon sign.

Inspected new 700 Area emergency generator building and equipment and provided suitable fire extinguishers.

Conducted several conferences with Atomic Energy Commission and General Electric Engineering, contractors, and architect while recommending considerable changes in plans and specifications for new High School, Catholic School and Convent in the interest of better fire protection and life safety.

Conferred with Atomic Energy Commission Safety and Engineering Branches regarding plans for Columbia High School fire alarm system, hospital emergency light plant, hospital sprinkler systems and other related planning.

COMMUNITY OPERATIONS SECTION
ENGINEERING UNIT
MONTHLY REPORT
JUNE 1954

PERSONNEL:	Exempt	Non-Exempt	Total
Employees - Beginning of Month	6	3	9
Employees - End of Month	6	3	9

BUILDING PERMITS ISSUED IN JUNE

1. Garage Permit

NEW MUNICIPAL CONSTRUCTION STARTED IN JUNE

1. Replace Tennis Court Fences - Riverside Park
2. Sewer and Water Lines, Richland Heights Baptist Church

NEW PRIVATE CONSTRUCTION STARTED IN JUNE

NONE

ENGINEERING JOBS COMPLETED DURING JUNE

ESR I 90014 Free Methodist Church

ESR I 90104 Plans, Specs., Inspections, Newberry Building

ESR I 90124 Plans, Specs., Inspections, American Legion

ESR I 90154 Plans, Specs., Inspections, Parcell Service Station

ESR I 90614 Legal Description, Parking Lot, Baptist Church, G.W.W.

ESR I 90674 Utility Lines, Plots for Churches

ESR I 90754 Legal Description & Diagrams, Churches

ESR I 90774 Legal Description with utilities and plot drawing, SE corner Lee Blvd. and Wellsian Way

ESR I 90784 Legal Description with utilities, Plot SW Corner Skyline Theater

ESR I 90794 Legal Description with utilities, Junior Chamber of Commerce

ESR I 90814 Legal Description, Plot west of By's Burgers

ESR I 90824 Legal Description, Plot on east side of Wellsian Way

ESR I 90834 Legal Description, Burlin Camp Area

ESR I 90854 Legal Description, Area east of Stevens between Lee and Knight

ESR I 90864 Legal Description, Site A, Corner of Goethals & Williams

ENGINEERING UNIT (Cont.)

ENGINEERING JOBS COMPLETED DURING JUNE (Cont.)

ESR I 90874 Legal Description, Site B, Corner of Goethals & Williams

ESR I 90924 Legal Descriptions, Eat Plot, Lots 1, 2, and 3, Wright and Van Giesen

ESR I 90934 As Builts, Commercial Buildings (Skyline Theater, Rice Rug, Diettrich's Market, and Richland Theater)

ESR I 90954 As Builts, Medical Dental Properties

ESR I 90994 Cost Estimate, Metal Duct Work, Desert Inn

ESR I 91034 Survey - SE corner, Concrete Inc. Property

K-811 Extend Sewer to New Commercial Bldg., Hartfor & Duportail

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED

PROJECTS

CA 570 Replace Raw Water Line, #5 Well to Lee Blvd. - Design 99% complete. To AEC for review June 14, 1954.

CA 577 Improvements to Existing Streets, George Washington Way, FY 1954. Received bids for contract June 25, 1954.

L-004 Guthrie Avenue Sidewalk - Gilmore to Goethals - Received bids June 15, 1954. No award was made.

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 - Received bids June 15, 1954. No award was made.

L-394 Replace Tennis Court Fences, Riverside Park - 10% complete. Wire damaged in shipment, and job is held up until wire is replaced.

L-734 Sewer & Water lines to Richland Heights Baptist Church - 25% complete. Water services installed.

L-884 Relocation of 8" Water Maine on Duane Avenue, Lee Boulevard to Gillespie St. - Contract awarded. Notice to proceed issued June 23, 1954.

IR-165 Parking Facilities, Kadlec Hospital - Received bids June 15, 1954. No award was made.

IR-167 Erosion Control & Development, FY 1953, Part I - Contract awarded. Notice to proceed issued June 23, 1954.

IR-171 Automatic Bar Screens, Sewage Lift Station - Bid opening June 28, 1954. No bids were received. Job to be readvertised.

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED (Cont.)

PROJECTS (Cont.)

IR-173 Air Conditioning, Community House - Bid opening June 28, 1954. Bids being analyzed.

IR-174 Electricity Metering, Richland Domestic Water System - Equipment being ordered.

IR-175 Expansion of Riverside Park - Contract awarded. Notice to proceed issued June 23, 1954.

IR-176 Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park. Design 95% complete.

ENGINEERING SERVICE REQUESTS

I 90024 First Baptist Church (Richmond and Raleigh Streets) - Construction 92% complete. No progress this month.

I 90034 Assembly of God Church - Construction 85% complete. Work progressing very slowly.

I 90044 Alteration Permits - An open active file.

I 90064 Television Antennae - An open active file.

I 90094 Plans, Specs., Inspections, Grace Bacon Roller Rink - Construction 98% complete. No progress this month. Open for business.

I 90114 Plans, Specs., Inspections, Latter Day Saints Storehouse - Construction 99% complete. Final inspection to be made.

I 90184 Plans, Specs., Inspections, Safeway Store - Construction 80% complete. Work progressing slowly. Sprinkler system installation started.

I 90204 Plans, Specs., Inspections, EH Kidwell Service Station - Construction 70% complete. Work progressing on schedule.

I 90234 Inspections and Liaison, Bauer-Day Housing - Project complete and occupied. Minor exceptions being cleared.

I 90244 Plans, Specs., Inspections, Church of Nazarene Addition - 69% complete. Work progressing very slowly.

I 90254 Plans, Specs., Inspections, Seattle First National Bank Addition - 99% complete. Final inspection to be made. Open for business.

I 90264 Plans, Specs., Inspections, Richland Heights Baptist Church - Construction 15% complete. Work progressing on schedule.

I 90324 Design, Engineering, Inspection, Walks and Drives at Columbia Playfield - Received bids June 25, 1954. Under consideration by AEC.

I 90334 Plans, Specs., Inspections, Richland Baptist Church, G.W.W. - Construction 85% complete. Progressing on schedule. Facilities being used.

ENGINEERING SERVICE REQUESTS (Cont.)

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.

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 again progressing after delays for other work prior to start of fiscal year.

I 90604 Inspection 24" Sanitary Sewer, Swift Boulevard - Construction 95% complete.

I 90624 Title III Services, Storm Drain, George Washington Way - Construction 75% complete.

I 90634 Kadlec Hospital Grounds Improvements - Bids opened June 8 - No award was made

I 90684 Plans, Specs., Inspections, LG Cook Building Addition - 99% complete. Final inspection to be made. Open for business.

I 90704 Plans, Specs., Inspections, Christ the King Parish (Catholic) - 15% complete. Construction progressing rapidly.

I 90724 Extension Duane Avenue Shelterbelt - Project prepared and ready for submission.

I 90734 Sewer and Water Connections, Richland Heights Baptist Church, Thayer and Duportail - ESR closed. See project L-734.

I 90764 Plans and inspections, Rest Rooms, Desert Inn - 99% complete. Final inspection to be made.

I 90804 Legal Description, Safeway Building #1 - 95% complete.

I 90844 Plans, Specs., Inspections, Central UP Church - Plans received and reviewed. Bids on construction received by owners.

I 90894 Legal Description, Plot south of Linn Motors - 90% complete.

I 90904 6" Water Main, Stevens Drive Kadlec Hospital to Central UP Church - Project approved. Bid assembly being prepared.

I 90914 Utility Lines, Legal Descriptions, and Diagrams - Churches - 70% complete.

I 90944 Erosion and Dust Control, 300 Area - Project being reviewed by Engineering Department preparatory to submission to AEC.

I 90984 Legal Description, 737 Stevens Drive (former Morning Sun Dairy) - 95% complete.

I 91004 Guthrie Avenue Sidewalk and Street Widening - Gilmore to Goethals - ESR closed into Project L-004. Received bids June 15, 1954. No award was made.

ENGINEERING SERVICE REQUESTS (Cont.)

I 91014 Retirement of Separate Irrigation System - Work in progress on design.

I 91024 Retirement of Irrigation Canal - Scheduled for design in July.

I 91044 Sketch, Review, and Legal Description, Tidewater Associated Oil Company. 50% complete.

COMMUNITY REAL ESTATE SECTION

JUNE 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	135	10	135
Commercial Property Unit				
357	6	5	6	5
	22	159	22	159

Decrease or increase in number of employees 0

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING June 30, 1954
HOUSES OCCUPIED BY FAMILY GROUPS

	Conven	A&J	T	Pre Cut	Ranch	Pre Fab	Dorm Apt.	A&J Apt.	2BR Apt.	4th Hsg.	Tract	Total
G. E. Employees	2228	254	10	384	833	1127	10	54	61	201	38	5200
Comm. Fac.	92	18		29	61	49		5	3	7	2	266
AEC	71	27		21	58	14		5	3	14	3	216
Other Gov't	7	2			3	1					1	14
Post Office	5				2	9				1	3	20
Schools	57			7	9	51			1	1		126
Comm. Activities	9			1	6	4					1	21
Med. Facilities	3	18			3	1				3		28
Chas. T. Main	3			2	5	7				2		19
Kaiser Eng.	6	7			8	1						22
J. A. Jones	2	2			2	1						7
Blaw-Knox	3	2		2	1							8
P. S. Lord	1				2							3
Vitro Corp.	1											1
Vernita Orchards											5	5
Minor Const.					1							1
Commonwealth Inc.						1						1
Basco Const. Co.		1										1
Not Certified	2				3	7					1	13
Total	2490	331	10	446	997	1273	10	64	68	229	54	5972
Assigned Leases Written				1						1		2
Assigned Leases Not Written	4	2		2	2	13			1			24
Available For Assignment	6			1	1	1			1			10
Total	2500	333	10	450	1000	1287	10	64	70	230	54	6008

	Begin Month	Moved In	Moved Out	End of Month	Diff.
Conventional Type	2491	+26	-27	2490	-1
A&J Type	333	+6	-8	331	-2
"T" Type	10	+1	-1	10	
Precut Type	449	+6	-9	446	-3
Ranch Type	999	+8	-10	997	-2
PreFab Type	1285	+27	-39	1273	-12
Dorm Apts.	10			10	
A&J Apts.	63	+3	-2	64	+1
2BR Apts	70	+1	-3	68	-2
4th Housing	230	+2	-3	229	-1
Tracts	54			54	
Total	5994	+80	-102	5972	-22

June 1954

DORMITORY REPORT

Dormitories:

	Beds Available	Vacant Beds	Occupied Beds
Men	477	31	446
Women	381*	82**	299
Total	858*	113	745*

*This includes 2 beds used for Dorm Offices
**This includes 33 vacant beds in Dorm M 13

Waiting Lists

	Single Rooms	Double Rooms
Men	4	0
Women	6	0

The following Dormitories are in Stand-by condition:

W 21	50 beds	W 15	50 beds
W 17	50 beds	M 7	39 beds
W 16	50 beds		

Total beds 239

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	32
R.O.F.	0
Discharge	0
Transfers	9
Retirement	1
Move off project	17
Divorce	2
Death	2
Move to Wherry House	1
Misc.	0
Not eligible	1
Total	65

ALLOCATIONS

Houses allocated to new tenants	27
Exchanged houses	8
Moves(within the village)	35
Turnovers(divorce, death, schools)	9
Total leases signed	80
Total cancellations	117
Wherry house move to G.E. house	1
Houses assigned AS IS	41
Houses sent to renovation	47
Applications pending	306

Removal of 65 Prefabricated Type Houses:

Excess papers have been sent to the Stores Unit on the following number of prefabricated type houses:

	1BR	2BR	3BR	Total
March	4	0	0	4
April	14	6	2	22
May	16	2	0	18
June	8	2	0	10
Total	42	10	2	54

TENANT RELATIONS PROGRESS REPORT

	Orders incomplete as of May 31, 1954	Orders issued 5-31 to 6-30	Total orders Incomplete as of June 30, 1954
Service orders	517	1745	472
Work orders	732	409	787
Service charges		182	
Sewer stoppages due to tree roots		18	

Principal work order loads	Incomplete as of May 31, 1954	Incomplete as of June 30, 1954
Laundry tub replacement	18	26
Bathroom renovations (tub, tile, lino.)	2	0
Tileboard bathroom	7	11
Kitchen floor linoleum	45	53
Kitchen cabinet linoleum	50	101
Shower stall	9	2

---

82 alteration permits were issued, as compared to 98 issued in May.

Install air conditioner	14	Install automatic washer	6
Install automatic dryer	6	Install fence	14
Install porch light	1	Basement excavation	3
Remove partitions	2	Install additional outlets	3
Install patio	8	Construct tool shed	2
Convert to oil	5	Install driveway	1
Install sidewalk & steps	1	Install back door	2
Remove laundry trays	2	Install kitchen cabinets	1
Install clothes poles	1	Install TV	1
Reverse range & refer	2	Install fireplace	2
Install cooling pads in furnace	1	Install porch steps	1
Install additional wiring	1	Install coal stoker	1
Install linoleum in kitchen nook	1		

---

655 inspections were made, as compared to 552 made in May.

Alteration permits	48	Basement	2
Bathroom	2	Doors	4
Fill	6	Floorboards	5
Laundry trays	4	Linoleum	152
Lot lines	2	Porch & steps	9
Recall range & refer	5	Shower stall	1
Shower rod	2	Screens	4
Sidewalks	11	Shakes	2
Sink	2	Toilet	1
Toilet seat	16	Trees	13
Walls	5	Windows	1
Yard	5	Miscellaneous	25
Dormitories	45	Renovations	102
Cancellations	100	Shows (new tenants)	58
Houses to be removed	23		

EXTERIOR PAINT REPORT

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	244	13	24	220
B	288	51	98	190
D	2	0	0	2
E	43	12	22	21
F	115	22	40	75
G	5	0	0	5
H	152	19	43	109
L	39	1	3	36
Tract	20	1	4	16
Total	908 (1440)	119	234	674

560 Houses sprayed.

Est. M.H. B. F.	5638	Actual M.H. B. F.	7321
Est. M.H. This Mo.	6013	Act. M.H. This Mo.	6961
Total Est. M.H.	11,651	Total Act. M.H.	14,282

Total Season Estimate 47,732

PLUMBING SHOP

JOB DESCRIPTION	NO. COMPLETED
Replacements - Major Fixtures:	
Bathtubs	2
Shower Stalls	7
Electric Water Heaters	17
Laundry Tubs	1
Plumbing Work Orders	56
Plumbing for floor tile replacement	2
Cleared major sewer stoppages caused by tree roots	33
Plumbing for sink top replacement	39
Steam work orders	17

Steam inspection once a week on Government owned apartments, dormitories, and commercial buildings.

Excavated with backhoe machine sewer lines, water mains, and all leaking broken underground piping so repairs could be made.

Turned off steam heat in all apartments and dormitories.

SERVICE ORDER CREW

The following is a status report on service orders:

A.	On hand at the beginning of the month	229
B.	Received during the month	1478
C.	Completed during the month	1448
D.	On hand at the end of the month	259

E. A total of 708.7 man hours were spent on work orders.

F. Backlog of service orders by craft:

Electrical	46
Plumbing	82
Carpentry	100
Total	259

RENOVATION AND LABOR CREW

JOB DESCRIPTION	NO. COMPLETED
Renovation orders processed	29
Trash pickups	46
Minor carpenter repairs to housing units	31
Minor carpenter repairs to dormitories	11
Dormitory rooms redecorated	0

Sprayed entire dormitories M-3, M-4, M-6, M-8, and W-9 for silver fish.

All occupied dormitories serviced with linen and janitorial supplies.

MECHANICAL SHOP

A. Millwright Crew:

Service orders	44
Routine furnace inspections	407

B. Sheetmetal Crew:

Gutters and flashings	123
Smoke pipes replaced	4
Coal hatch flashing	3
Window screen repaired	12

C. Truck Drivers and Servicemen:

Tree removal orders	26
Top soil delivered	13
Sidewalks removed	9
Sidewalks repaired	10

CARPENTER AND LINOLEUM SHOP

JOB DESCRIPTION	NO. COMPLETED
Install bathtubs	2
Replace bath wall tile	2
Repair bath wall tile	4
Replace bath floor linoleum	2
Repair bath floor linoleum	1
Replace kitchen floor linoleum	43
Repair kitchen floor linoleum	7
Replace steps and landing linoleum	1
Replace bedroom linoleum	1
Replace utility room linoleum	1
Repair utility room linoleum	1
Replace living room floor linoleum	1
Repair living room floor linoleum	1
Repair floor tile - commercial facilities	2
Repair floor tile - dormitories	1
Replace kitchen sink top linoleum	63
Repair kitchen sink top linoleum	5
Replace work bench linoleum	6
Replace kitchen sinks	2
Drill weepholes	35
Replace sash balances	1
Weatherstrip windows	1
Repair roof - commercial facilities	1
Repair roof - houses	1
Raise slab	1
Repair porches	221
Sidewalk forms	4
Concrete walks	4
Repair thresholds	8
Repair basement wall	3
Repair exterior doors	7
Chempoint - routine orders	6
Chempoint - work orders	64
Paint touch ups	139
Interior carpentry repair - houses	4
Exterior carpentry repair - houses division 7	194
Ranch House window screen repair	366

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION

June, 1954

PERSONNEL - COMMERCIAL PROPERTY UNIT:	June
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
May	1,639	191	120	1	1,759	192
June	1,636	198	120	1	1,756	199
Net Change	-3	+7	0	0	-3	+7

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	52	15	3	0	55	15	70
Bach Charges	1	0	0	0	1	0	1
FY Work Orders	559	207	17	0	576	207	783
FY Back Charges	27	1	4	0	31	1	32

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Lease:

J. R. Parcell - a ground lease covering the construction and operation of a service station to be located in the Light Industrial Area.

2. Supplemental Agreement:

Davis Furniture Company - to provide for the discontinuance of refuse-removal service furnished by General Electric Company.

3. Business Development:

a. Invitations to Bid were forwarded to eighty-five prospective Lessees in connection with the leasing of Building 89-X and the space formerly

occupied by the Washington State Liquor Store in a building at 94 Lee. Seven Proposals were received and these were opened and read on June 24.

b. Invitations to Bid were forwarded to thirty-two prospective Lessees for development of the area containing approximately thirty-eight acres located north of the existing Uptown Business District. Proposals received are to be opened and read September 15.

c. Invitations to Bid were forwarded to fifty-three prospective Lessees for each of the two sites located at the intersection of Goethals Drive and Williams Boulevard. Proposals received are to be opened and read July 7.

d. Invitations to Bid were mailed to sixty-eight prospective Lessees in connection with leasing the plot located at Stevens Drive and Knight Street. Proposals received are to be opened and read July 14.

e. Invitations to Bid were mailed to twenty prospective Lessees in connection with leasing the plot of land fronting on Gillespie Street in the Light Industrial Area. Proposals received will be opened and read July 14.

f. Invitations to Bid were mailed to twenty-five prospective Lessees in connection with leasing the vacant plot of land located south of Linn Motors. Proposals received are to be opened and read July 20.

B. Noncommercial:

1. Sale of Church Property:

a. A deed transferring title to government building and land was executed by the United States Atomic Energy Commission on June 7, 1954, conveying title to Christ the King Catholic Church.

GENERAL:

A. Commercial:

1. Pasco Tri-City Storage, subleasing space in the Spencer-Kirkpatrick Building, terminated.

2. Walla Walla District Engineers, subleasing space in the Spencer-Kirkpatrick Building, terminated.

3. Permission was given to Anderson Motors to assign their Commercial Facility Lease from a partnership to a corporation.

4. P. H. Hager sold his business and assigned his Commercial Facility Lease to L. R. Heaton, for continued operation of the Bus Depot.

5. Final Inspection Report was received on the Richland Realty, Inc. Building, Block 5, Uptown Business District.

6. Final Inspection Report was received on the D & H Texaco Service Building located at Duportail & Hartford Streets.

B. Noncommercial:

1. Three new pasture permits were issued.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland.

Locksmith and Keymaker	Drive-In Barbecue Restaurant
Service Stations	Equipment Rental

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION June, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial:	MAY			JUNE		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Number of Government-owned Buildings	40	8	48	40	8	48
a. Number of Prime Lessee Businesses	38	9	47	38	9	47
b. Number of Sublessee Businesses	17	0	17	17	0	17
c. Total Businesses in Government-owned Buildings	55	9	64	55	9	64
2. Doctors and Dentists in Private Practice	27	0	27	27	0	27
3. Number of Privately-owned Buildings	67	7	74	67	7	74
a. Number of Prime Lessee Businesses	42	6	48	42	6	48
b. Number of Businesses operated by Sublessees	112	1	113	110	1	111
c. Total Businesses in Privately-owned Buildings	154	7	161	152	7	159
4. Privately-owned Buildings under Construction	6	2	8	4	2	6
5. Total Number of Businesses in Operation	209	16	225	207	16	223

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION

June, 1954

SUMMARY OR OCCUPANCY AND EXPANSION STATUS:

B. Noncommercial:

	MAY			JUNE		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Government-owned Buildings						
a. Churches	3			2		
b. Clubs and Organizations	5			5		
c. Government Agencies	2			2		
Total	10		Total	9		
2. Privately-owned Buildings						
a. Completed and in use	10	1	11	10	1	11
b. Under Construction	6	2	8	6	2	8
Total	16	3	19	16	3	19
3. Church Plots and Buildings in Private Ownership				2		2
4. Pasture Land Permits			101			104

RADIOLOGICAL SCIENCES DEPARTMENT

JUNE, 1954

Summary

Twenty informal, 9 Class I and no Class II radiation incidents were recorded.

A substantial fraction of the department's effort was diverted to the various ramifications of the ruthenium contamination problem, ranging from the immediate tasks of particle detection and removal to the development of appropriate biophysical and biological parameters for a firmer appraisal of the specific hazards.

At the end of the month, a further emission of ruthenium spread in a southeasterly direction, and significantly active particles were found in the Tri-City area and near Benton City. The incidence of such particles was sufficiently low that the probability of injury to personnel was minimal. Nevertheless, both in reality and from public relations interest, the contamination situation was probably worse than it has been before in the history of the operation.

Progress by the research and development sections was largely confined to the ruthenium studies. Other items of interest included (1) a more or less satisfactory demonstration that bioassay of urine for tritium oxides is an adequate control whether the primary exposure is due to tritium oxides or tritium gas, and (2) sufficient analysis of water disposal potentialities in the Gable Mountain area to define the high local variability of conditions.

Communications work included a departmental meeting of exempt-roll personnel, and the arrangements for a discussion of the Chalk River reactor accident.

RADIOLOGICAL SCIENCES DEPARTMENT

JUNE, 1954

Organization

The month end force of 372 included 39 supervisors, 88 engineers and scientists, 19 clerical, and 226 other personnel.

Number of Employees on Payroll

Beginning of Month	-	371
End of Month	-	372
Net Increase	-	1

General

There were 20 informal, 9 Class I and no Class II radiation incidents, for an unusually low total.

A substantial portion of the department's effort was given to problems arising from repeated emission of intensely radioactive particles (predominantly Ru^{103} and Ru^{106}) from the Redox stack. Near the beginning of the month, construction work of several subcontractors was interrupted briefly while decontamination of affected areas was completed. Through the cooperation of all organizations having qualified monitoring personnel, as many as 60 were in the field at one time, and the clean-up work progressed at a good pace.

Near the end of the month, the emission pattern was repeated while the Redox plant was shut down to make engineering modifications that should alleviate the contamination conditions. The construction areas were re-infested with active particles, and in addition, one plume moved southeast toward Richland. Active particles were found outside the reserved area in Richland, North Richland, Pasco, Benton City and near Prosser. What at first sight appeared to be a very critical situation was later determined to be more of a nuisance than a major hazard. It happened that all the most active particles were detected in the first quick survey. More extensive surveys, largely conducted in a somewhat furtive fashion to hold public interest to a minimum, failed to reveal additional significantly active particles, although the whole town did show radiation levels measurably above normal background.

In review, it appears possible that the more active isolated particles in the public areas came from private cars that had picked them up inside the reservation. The probability of injury to personnel under these conditions was estimated to be vanishingly small; nevertheless, it would hardly be possible to maintain that damage could not occur, and corrective measures to eliminate such occurrences are imperative.

Some points of interest about the particles are:

1. The activity of individual particles ranged up to 100 μc, and was commonly in the 5 to 10 μc range.

2. While the predominant isotopes were Ru^{103}, Ru^{106} and their Rh daughters, the content of Sr isotopes and other internally hazardous components was sufficient to cause concern if the emissions continue.

3. The highly active particles are large (100 microns or more) and are therefore externally hazardous only.

4. These particles are quite friable, and fragments could be of respirable dimensions.

5. The contact dose-rate of the particles on skin is calculated to be about 20,000 rads per hour for a particle reading 1 rad per hour on conventional survey, and about 50,000 rads per hour for a nominal 20 rad per hour particle. However, with highly localized radiation and sharp fall-off away from the particle, the skin would be expected to tolerate high total doses without significant injury.

6. As an example, a particle reading 400 mrads per hour caused no visible effect on the skin of a pig in 5 days. More active particles produced small necrotic areas.

7. Measurements in serum suggest that particles in the lung would be comparatively soluble so that the limiting hazard would be that of deposition in the critical organ, rather than of localized lung irradiation.

8. The critical organ for ruthenium is taken to be kidney. A private report of some British data showed the bone to be a region of significant deposition in some cases. This would be more troublesome, and investigations on the point are being made.

9. Field surveys of ruthenium particles have to be interpreted with caution. The energy of the beta particles of the rhodium daughter is enough to cause penetration through the normal chamber wall. Gamma ray readings therefore tend to be falsely high. Suitable correction factors are being developed.

10. Apparatus can be made to detect internal depositions of ruthenium isotopes. Preliminary measurements have shown some positive data.

Radiological Sciences Department

During the month, there was a skirmish with the local press as a result of ill-advised publicity on a laboratory radiation incident.

Inventions

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

The U.S.P.H.S. report on Columbia River Studies was reviewed with a representative of that organization. It appeared that appropriate correction of the points prejudicial to the Company's position would be made.

Atomic Energy Commission Radiological Physics Fellows, in the joint program with the University of Washington, arrived at the site for field training.

A general departmental meeting for exempt roll personnel was held.

At the request of the Atomic Energy Commission, the department arranged for a three-hour exposition on the Chalk River reactor accident to interested personnel of all departments by Mr. G. Hatfield.

RADIOLOGICAL ENGINEERING

The Biology Laboratory project was completed. A project proposal for additional facilities to study respiratory hazards of particles was submitted.

A design and operating basis to control shoreline discharge of reactor effluent was established. Short-term overflow from filter backwashing, etc., does not appear to present significant local river problems.

Modifications to the stack sampling equipment at Purex and Redox were recommended as a result of a study of sampler characteristics necessary for isokinetic flow.

An unclassified report was prepared, at the request of the Atomic Energy Commission, on ground disposal of radioactive wastes at Hanford.

Radiological Sciences Department

RADIOLOGICAL RECORDS AND STANDARDS

Radiation Monitoring Unit

	May	June	1954 to Date
Special Work Permits	632	470	3,223
Routine and Special Surveys	1,625	1,334	9,794
Air Samples	1,493	1,142	9,074
Skin Contamination	26	12	108

Extensive ground surveys were made in areas occupied by military, construction, and other collateral contractor personnel. Decontamination of several hundred acres was required and completed.

Widespread alpha contamination on the floors of laboratories, corridors, locker rooms, lobby, and lunchroom of the 325 Radiochemistry Building resulted in shoe contamination of 21 persons. The contamination was so extensive that the source and mechanism of spread were obscured. However, portions of the building occupied by Separations Technology were the most contaminated. (Class I, No. 365)

Forty nine of 337 vehicles monitored at the 700 and 1100 Area garages were found contaminated.

Radiological Standards

Radiation Incidents

Type	May	June	1954 to Date
Informal	36	20	153
Class I	4	9	42
Class II	3	0	10

Four of the Class I incidents involved serious contamination problems, three involved poor radiation monitoring, and two involved inadequacy or disregard of procedure.

Exposure Records

Personnel Meters, and Records and Photometry

	May	June	1954 to Date
Gamma Pencils read	234,374	232,902	1,350,588
Potential overexposures	7	14	67
Confirmed overexposures	0	0	2
Slow Neutron Pencils read	1,598	1,372	6,794
Potential overexposures	0	0	0
Confirmed overexposures	0	0	0
Beta-Gamma Film Badges processed	37,848	40,744	222,808
Potential overexposures	42	187*	480
Confirmed overexposures	0	0	2
Fast Neutron Badges processed	547	575	2,578
Potential overexposures	0	2	4
Confirmed overexposures	0	0	0
Lost readings (all causes)	30	1,246*	1,456

*Most cases reported here were due to fogged film.

Radiological Sciences Department

Bioassay

Plutonium Analyses

	May	June	1954 to Date
Samples assayed	771	625	4,742
Results above detection limit*	35	18	153
Resamples assayed	25	36	222
Results above detection limit*	12	8	62
Maximum d/m/sample	2.27	2.32	2.32

*Detection limit was 0.05 d/m.

Fission Product Analyses

	May	June	1954 to Date
Samples assayed	826	669	5,109
Results above 10 c/m/sample	0	2	12

Resamples for the cases above 10 c/m are in progress.

Uranium Analyses

Results of 298 samples processed this month are tabulated below. This brings the total number of samples processed in 1954 to 1,651.

Sample Description	End of 4th Day Exposure /ug/liter Maximum	Average	Number Samples	End of 2 Days-No Exposure /ug/liter Maximum	Average	Number Samples
Metal Preparation	16.8	2.7	96	8.7	1.5	73
Technical	19.6	6.6	15	5.5	2.8	12
UO_3 Plant	109.7	3.7	97	---	---	---

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	31	0	0	0	0	31	1,484

Thyroid Checks

All thyroid checks reported were below the warning level.

Radiological Sciences Department

Hand Score Summary

There were 32,762 alpha and 45,927 beta scores reported. None of the alpha and about 0.008% of the beta scores were above the warning level. Decontamination of the reported high cases was attempted and was successful.

Calibrations

	Number of Routine Calibrations		
	May	June	1954 to Date
Fixed Instruments	67	33	414
Portable Instruments	3,116	3,530	19,794
Personnel Meters	11,484	18,158	98,485
Total	14,667	21,721	118,693

BIOPHYSICS

Control Unit

Regional Survey

The general findings are summarized in the following table:

Sample Type and Locations	Activity Type	Average Activity Density
		$\mu c/cc$
Drinking Water and Related Materials		
Benton City Water Co. Well	alpha	1.2×10^{-8}
Richland, N. Richland, Benton City Wells	alpha	$(<0.5$ to $1.2) \times 10^{-8}$
100 Areas	beta	$(<0.5$ to $1.3) \times 10^{-7}$
Pasco, Kennewick, McNary Dam	beta	$(<0.5$ to $1.1) \times 10^{-7}$
Backwash Solids - Pasco Filter Plant	beta	$(0.6$ to $7.0) \times 10^{-2}$ $\mu c/g$
Backwash Liquids - Pasco Filter Plant	beta	3.2×10^{-7}
Sand Filter - Pasco Filter Plant	beta	2.5×10^{-5} $\mu c/g$
Anthracite Filter - Pasco Filter Plant	beta	3.0×10^{-5} $\mu c/g$
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	$(<0.5$ to $1.8) \times 10^{-7}$
Columbia River - Hanford Ferry	beta	2.8×10^{-6}
Columbia River - Below Reactors	beta	5.8×10^{-6}
Columbia River - Shore Mud	beta	$(3.1$ to $6.6) \times 10^{-5}$ $\mu c/g$

Radiological Sciences Department

Sample Type and Locations	Activity Type	Average Activity Density /uc/cc
Other Waters and Related Materials (continued)		
Raw Water - Operating Areas	beta	(<0.5 to 2.7) x 10^{-7}
Reactor Effluent Retention Basins to River	beta	13,000 to 20,000 /uc/sec (3.6 to 6.3) x 10^{-3}
**Reactor Effluent Retention Basins to River	alpha	<0.03 /uc/sec <5 x 10^{-9}
I-131 in Farm Wastes to River	I-131	29 /uc/day 5.8 x 10^{-7}
I-131 in Columbia River - Hanford	I-131	6.7 x 10^{-8}
Atmospheric Pollution		
Gross Alpha Emitters	alpha	(<0.4 to 1.1) x 10^{-14}
Gross Dose Rate - Separations Areas	beta-gamma	1.3 to 33 mrads/day
Gross Dose Rate - Residential Areas	beta-gamma	0.3 to 0.8 mrad/day
Active Particles - Separations Areas	beta	(0.3 to 1.4) x 10^{-12}
I-131 Separations Areas	I-131	(0.06 to 1.1) x 10^{-12}
I-131 Separations Stacks	I-131	<0.54 curie/day
*Ruthenium - Separation Stacks	$Ru^{103,106}$	<0.54 curie/day
Rare Earths + Yttrium - Separation Stacks	beta-gamma	No measurements
Active Particles - Wash, Idaho, Ore., Mont.	-	0.03 to 0.26 ptle/m^3
Active Particles - HAPO	-	0.02 to 0.86 ptle/m^3
Tritium (as oxide) - Reactor Stacks	T	0.88 curie/day
Vegetation		
		/uc/g
Environs of Separations Areas	I-131	(0.6 to 1.3) x 10^{-5}
Residential Areas	I-131	<3 x 10^{-6}
Eastern Washington and Oregon	I-131	<3 x 10^{-6}
Non-Volatile Beta Emitters Wash. & Ore.	beta	4.3 x 10^{-5}
Alpha Emitters - Separations Areas	alpha	1 x 10^{-7}
Alpha Emitters - 300 Area	alpha	1.6 x 10^{-7}

*Note: Troublesome delayed emissions from stack coating above the monitors would not be included here.

** The comparable figures for the two previous months have been erroneously reported high by a factor of 1,000. Throughout this period alpha activity density has been at or below the detection limit of 5 x 10^{-9} /uc/cc, which corresponds with 0.014 to 0.03 /uc/sec for the separate reactors.

Radiological Sciences Department

Surveys for ground contamination made during the early part of the month showed significant deposition of radioactive particles in the immediate environs of 200-W and 200-E areas. The particles were found at a frequency of one every 1 to 2 sq. ft. in the 200-W area and one every 50 sq. ft. in the 200-E area with dosage readings as high as 20 rads/hour.* Surveys made near the end of the month revealed further contamination as far away as the highway from North Richland to Prosser Barricade, and near Columbia Camp with dosage readings as high as 200 mrads/hour.

Air filters, removed during the week ending May 21, showed airborne radioactive particle concentrations ranging from 0.1 to 0.8 particles/cubic meter in Pacific Northwest locations with radioactive decay studies of the particles indicating their origin to be bomb fallout.

Activity density of beta particle emitters in Columbia River water at Astoria, Oregon, during low tide on June 22, was on the order of 1 to 2×10^{-8} μc/cc.

*Dose rate readings such as this, made in field surveys, are obtained under standard conditions of monitoring. If the source is actually a small particle, the dose-rate in skin, if the particle were in contact with the body, would be very much higher, and not linearly proportional to the survey dose rate.

	Survey		Skin
As examples,	100 mrads/hr	=	~ 2000 rads/hr
	1 rad/hr	=	~ 20,000 rads/hr
	20 rads/hr	=	~ 50,000 rads/hr

Analytical Laboratory

Routine and special analyses were carried out as follows:

Type Sample	Analyses Completed May	June	1954 to Date
Vegetation	1,234	1,506	7,810
Water	2,003	2,028	12,439
Solids	235	289	1,460
Air Samples	482	501	3,023
Uranium (Fluorophotometer)	471	612	3,403
Oil Fog (Fluorophotometer)	329	375	882
Special Survey Samples (RMSS)	2	21	84
Special Survey Samples (RMU-RS)	30	69	241
Tritium Oxide	519	508	1,351
Total	5,305	5,909	30,693

The current routine radiochemical analytical procedure for the determination of I^{131} on vegetation has been revised to increase the sensitivity of the method by a factor of three through the use of larger sample aliquots.

Radiological Sciences Department

Radiochemical analysis of particles found in the 100-B, 200-W and 200-E areas during the early part of the month revealed similar material in all areas of deposition with over 90 percent of the activity of the particles from ruthenium and rhodium and less than 3 percent of the activity from each of strontium, zirconium, and the rare earth-yttrium group.

Control Services

Comparison of the average activity of gross beta particle emitters in 107 Basin effluent water during the second quarter of 1954 with that during the first quarter revealed that second quarter averages were 20 to 30% higher at 100-C, 100-D, and 100-F and 80% higher at 100-H. Increases could be attributed in part to expected seasonal variations in cooling water quality. Revision of factors for routine calculation of counting room results was continued using improvements noted in the Standard Practices Counting Manual (HW-30492).

Synoptic Meteorology

Type of Forecast	Number Made	Percent Reliability
8 hour production	90	83.8
24 hour general	60	83.1
Special	1110	88.2

The monthly rainfall total, 0.10 inch, was 0.44 inch below normal for June. The over-all monthly temperature average 65.5°F. was 3.9° below normal for June.

Experimental Meteorology

Three different modifications of the anemometer circuitry on the Portable Mast were tested but none corrected the zero drift and signal transient difficulties. Four anemometer groups were therefore fitted with their totalizing dials for use in determining the average wind speed.

A study was commenced of the natural atmospheric particulate background with primary emphasis on the particle size distribution and concentration of atmospheric dust as related to mean wind speed and height above the ground surface.

A study of oil-fog calibration methods indicated that specific fluorescence of the oil decreases as the time interval between generation and sampling increases and that the specific fluorescence of the oil in samples depends somewhat upon the method of sampling. The relationships are under laboratory study.

Collection and analysis of data from the wind station network continued. An estimated annual saving of $2,500 is expected from revision of the method of data transcription to include "mark sensing" IBM cards.

Radiological Sciences Department

Earth Sciences

Studies in the Gable Mountain well system continued to indicate extreme variations in permeabilities and rates of ground water flow; comprehensive prediction of waste disposal possibilities under these conditions will be difficult.

Continued studies with 1st cycle waste evaporator bottoms indicated that one column volume can be safely discharged to ground without significant contamination of the ground water by cesium or strontium.

Studies of soil adsorption of plutonium from salt solutions indicated that the adsorption decreased with an increase in calcium acetate concentration but not with an increase in calcium nitrate concentration.

Industrial Hygiene

Air samples were collected in the canning section of 313 Building to determine the extent of atmospheric lead contamination from the preheat pot melts. No hazard was found although demonstrable quantities of lead were present in all samples.

A study was made at the request of HOO of atmospheric conditions associated with the heliarc welding operations of Kaiser Engineers at White Bluffs. The concentrations of argon and carbon dioxide were found in some instances to be higher than normal; the oxygen content of the air was normal.

At the request of Industrial Medical, charts were prepared showing the noise level findings of certain process buildings for use in evaluating claims of hearing loss filed against General Electric by Hanford employees.

Contributions to the department-wide attack on the ruthenium contamination problem included determinations of particle size and activity.

Methods

Solution rate studies of two ruthenium particles in 0.1 M HCl were completed. The initial solution rate of a 4.8×10^6 d/m particle was 0.29% of the activity per hour with 3.4% in solution after 48 hours. The second particle (4×10^5 d/m) had an initial solution rate of 11% of the activity per hour with 50% in solution after 48 hours. The hydrochloric acid content of the stomach varies from 0.05 to 0.1M; therefore these results give an indication of the fate of particles which enter the gastro-intestinal tract. These two widely different results mean that high solubility in gut will have to be assumed unless the offending particles in a specific case can be more closely categorized as belonging to a relatively insoluble class.

Air and aluminum absorption coefficients and backscatter factors were determined for Pm^{147}. Backscatter factors were determined for Zn^{65}. Self-absorption factors were determined for $Mo^{99}O_3$.

A gas-filled proportional chamber with a beryllium window was fabricated in order to study K-capture isotopes and low energy gamma rays from alpha emitters.

Radiological Sciences Department

Physics

It was shown that in the limit of zero thickness, anthracene scintillators, under study for application to survey instrumentation, have the same response to 1-2 Mev electrons as to beta and gamma rays. At greater thicknesses, the response to equal dose rates of electrons and beta rays is different because of different depth dose distributions, resulting from the different energy spectra in the two cases.

Regular Hanford film badges and badges containing thin gold foils were calibrated with the 400 KVP X-ray equipment at the Swedish Hospital, Seattle, which gives an energy not obtainable with local sources of radiation. The calibration was necessary to define more exactly the energy sensitivity curve for the insensitive film component of the badge.

Scattering measurements were made on Po-B neutrons in the Positive Ion Accelerator Laboratory with the same type source and equipment used in an extensive scattering study made previously. The measurements indicated less scattering in the experiment area than in any other building so far tested.

A scintillation counter system was assembled for use in the detection and measurement of radioactive materials within the body. As normally used, the 90% confidence limits on the counting rate were equivalent to the effect of 0.02 microcuries of Ru^{106} at the center of the body.

Routine progress was made on preparation of equipment for preparing Van de Graaff targets of zirconium filled with deuterium or tritium, measurement of neutron production by the action of X-rays on beryllium, an experiment to shed light on the processes resulting in the aging of GM tubes, and studies basic to a neutron area monitor.

Instrument Development

The survey instrument for monitoring ground contamination from a moving vehicle was completed. It detects gamma radiation with a NaI scintillation counter and achieves a high ratio of sensitivity to background by providing channels which emphasize either I^{131} or $Ru^{103\text{-}106}$ gamma photons; normal, nondiscriminatory operation is also available for general surveys. During a field test conducted in cooperation with Regional Survey, many particles were detected and some were isolated for measurement. Particles causing a C.P. meter to read 100mr/hr when in contact with the chamber could be detected at a distance of three feet by the bumper mounted counter.

Work on the well probe for monitoring Cs^{137} and $Ru^{103\text{-}106}$ in test wells was concentrated on minimizing the effects of probe temperature changes.

Design of all major circuits for the central control station of the radio telemetering system was completed and various elements are being tested continuously. Request was made to the Atomic Energy Commission for assignment of two frequencies for experimental transmission of data between the 329 Building and the Meteorology Tower; these frequencies will be used in the final system.

Radiological Sciences Department

A new two-tape filter sampler-monitor for use by Manufacturing was designed and is being constructed by Technical Shop. Beta counters were added and two tapes used to permit simultaneously monitoring two gas streams for particulates, e.g. up and down-stream of the sand filter.

An electrostatic precipitator was designed for separating particulate plutonium from the air to which experimental animals will be exposed in the Biology Section study of the deposition of plutonium in lungs.

BIOLOGY

Aquatic Biology

Biological Chains

Young salmon fed microorganisms (Daphnia) containing P^{32} retained 69% of the ingested isotope after 24 hours. One week later they still contained 67% and subsequent biological elimination was insignificant.

Highlights of the Columbia River Survey

Activity densities of river organisms declined to about half those of May as the freshet reached its crest. Channeling of 100-H effluent from the emergency flume resulted in abnormally high activity densities near shore immediately downstream.

Selected values of interest were:

Organism	Location	Sample Type	Activity Density (/uc/g)	
			May	June
Minnows (Shiners)	Hanford	Ave.	6×10^{-4}	3×10^{-4}
" "	Below 100-H	"	-	1.2×10^{-3}
Whitefish liver	Hanford	Max.	-	3×10^{-4}
Whitefish flesh	"	"	2×10^{-4}	2×10^{-5}
Plankton	"	Ave.	6.3×10^{-3}	2.4×10^{-3}
Midge Larvae	McNary Reservoir	"	1×10^{-4}	7×10^{-5}

Effluent Monitoring

Subjection of fingerling-sized chinook and sockeye salmon to concentration of area effluent demonstrates that young salmon spawned in tributaries of the Columbia upriver from HAPO will not be adversely affected on their downstream migration even if they should encounter 10% effluent for as long as six weeks. Young chinook salmon of migrating size are also able to tolerate 20° C water for at least 6 weeks.

Radiological Sciences Department

Biology Control Unit

Biological Monitoring

Cliff swallows nesting on the exterior of the 181-B Building used mud having an activity density of 3×10^{-2} μc/g. Specimens of the birds' bones showed 2×10^{-3} μc/g at 100-B to a maximum value of 8×10^{-3} μc/g at 100-F. These figures are about one-tenth those of 1953.

One hundred geese were banded in cooperation with the Washington State Department of Game.

Rodent thyroid activity densities decreased from last month's values. All were unusually uniform through all collection locations, with a mean activity density of 1.8×10^{-3} μc/g.

Clinical Laboratory, Radiochemistry, and Microscopy

Routine supporting services in the Section, and special services in Electron Microscopy for the Industrial Hygiene Unit.

Experimental Animal Farm

Toxicology of I^{131}

Metabolism of sheep fed I^{131}, as evidenced by thyroid radioiodine content, was somewhat lower in both the 5 and 0.15 μc/day groups of adult ewes compared with the values obtained one year ago.

Irradiation of Pig Skin with Radioactive Particles

Seven radioactive specks were applied to the sheared sides of two pigs. The normal field survey dose rates of the particles ranged from 0.4 to 20 rads/hour. (See footnote in Biophysics Section report)

The speck containing the least activity caused no effect after one week of continuous exposure. All other specks caused erythema within five days. The most active specks caused erythema in 15 hours and resulted in focal tissue destruction.

Metabolism

Plutonium Absorption and Metabolism

Although rats fed plutonium acutely show a higher soft tissue concentration of plutonium at sacrifice than do rats fed plutonium chronically, rats sacrificed two, three, five, and seven days after feeding showed no consistent trend of plutonium movement from the soft tissue to bone. These rats excreted 80% of the fed plutonium in the feces during the first five days following feeding; each succeeding day the amount excreted decreased by a factor of approximately 10. Only

Radiological Sciences Department

0.0004% of the plutonium fed occurred in the urine.

Fission Product Absorption and Metabolism

Sr gut absorption and bone deposition in rats was found to be independent of Sr carrier, Cs, Ru, and Y. Bone deposition amounted to 15 to 20% of the administered dose one day after feeding.

Tritium Absorption and Metabolism

Results were obtained which, while not statistically significant, strongly suggest that the percent of tritium administered as the oxide, which is bound into organic compounds of rats, becomes greater at higher tritium levels. This may be an effect of irradiation and will be further investigated.

Studies of bound tritium distribution and retention in rats following exposure to tritium gas indicate that, in general, the amount of bound tritium bears the same relationship to body water tritium as is observed in animals injected directly with tritium oxide. A few tissues do not conform to this general statement, but the conclusion is justified that bioassay results may be given the same interpretation regardless of whether the exposure was to tritium gas or tritium oxide.

Pharmacology and Experimental Therapeutics

Studies on removal of plutonium by combinations of EDTA and Zr were continued.

Plant Nutrition and Microbiology

Absorption and Translocation of Radioelements in Plants

The dichromate ion was found to exert its toxic effect on plants apparently by causing a change in the concentration of reducing sugars in the leaves.

Ambiguous results were obtained in relating the uptake into plants of Zr^{95}, Cs^{137}, and Ce^{144} with the size of soil particles.

Results of tests of mutation rate in barley grown for one year in different concentrations of pile effluent indicate that no more mutations were produced in plants watered with 5 or 100 percent effluent than in those watered with well water.

RBE by Microbiological Methods

It appeared from incomplete studies that bacteria which elongate following radiation are either completely inviable or nearly so. Further tests are under way to determine how soon death occurs and how this relates to evaluation of growth by turbidity.

FINANCIAL DEPARTMENT MONTHLY REPORT
JUNE, 1954

The obligation of funds for the ensuing twelve months was accomplished by the execution on June 28 of Supplemental Agreement No. 27 to the Prime Contract, providing for an additional $114,225,000, representing $17,625,000 for KAPL, $95,145,000 for HAPO and $1,455,000 for the Overhead Allowance. The latter figure represents a 15-months' budget. The total amount now obligated under Contract W-31-109-Eng-52 from its inception to date is $1,008,806,000.

Revision of the Budgets for FY 1956 and FY 1955 was started late in the month, as soon as revised program assumptions were released by A.E.C. It is expected that the A.E.C.'s request for preliminary figures by July 15 will be met.

Department Managers were requested to submit "ceiling" personnel estimates for FY 1955 for consolidation and submission to the General Manager about July 15.

The residual inventory of graphite, amounting to 1,213 tons and valued at $1,071,000, was assigned to the Stores Unit, which has been designated as custodian. Appropriate transfer of funds was made between A.E.C. and General Electric.

A representative of the General Cost Unit attended a meeting of hospital administrators and accountants in Yakima on June 25, the purpose of which was to discuss the present reimbursable cost form used in connection with the Washington State Welfare Medical Care Program and secure, if possible, a more equitable reimbursement to hospitals for services rendered welfare patients. Additional details necessary to adapt Kadlec Hospital costs to this program are being worked out.

A revised method of reporting revenues on water, sewerage, and waste removal was developed by the Community Cost group and subsequently approved by A.E.C., to be effective July 1, 1954. This provides a more equitable distribution of revenues between the units of the Community Operations Section. Community Cost has also developed new liquidation and assessment distribution procedures for use in FY 1955. Expense codes for FY 1955 have been issued and field personnel notified.

Recent changes in production forecasts resulting from the revised program assumptions indicated the need for an immediate revision of the TBP depreciation rate, and a new rate was developed and recommended for adoption as of June 1, 1954.

The following payments were made to courts during the month as a result of judgments in cases involving payments to employees:

Payment of the judgment in the Porter case, involving community firemen, was made to the Clerk of the U. S. District Court, Eastern District of Washington at Yakima in the net amount of $35,051. Settlements have not yet been made in the Canfield and the Rivers cases involving payments to community firemen.

Payment of the judgment in the Connolly and Black case, involving lunch time for plant guards, was made to the Clerk of the Superior Court, Franklin County at Pasco in the net amount of $50,933. This represents the final payment on such cases, a previous settlement having been made in the Lindell case.

Preparations were made for usual year-end entries to book all known costs for the fiscal year and adjust assets and liabilities for the year-end balance sheet. These entries include:

Distribution of costs included in deferred charges
Accrual for materials and services received but not yet billed by vendors
Adjustments of accruals for other liabilities
Adjustments of inventory and depreciation reserves

During June, $300,000 was received from the General Treasury Services Department due to the reduction of the du Pont Annuity Fund. This amount consisted of:

Proceeds from the sale of $150,000 face amount of U. S. Treasury 2½% bonds due 12/15/67		
Principal proceeds	$149 343.75	
Accrued interest	10.25	
		$149 354.00
Withdrawals of cash in Annuity Fund		150 646.00
		$300 000.00

Facilities reclassified as not in service were transferred to the appropriate plant and equipment accounts describing their use status as part of annual closings. Major components of the 234-5 facilities were removed from service and retired from the books. Charges to Extraordinary Depreciation and Obsolescence as a result of reclassification and retirement of equipment were $3,700,000, of which $1,910,000 was applicable to equipment retired and $1,790,000 applied to facilities transferred to Plant and Equipment Not Used or Useful.

The annual physical inventory of excess materials and equipment was taken as scheduled as of June 2. Preliminary results indicated a net shortage of $58,000. Work is still under way to determine reasons for the shortage; it appears that the variance is due to an over-valuation of the physical inventory taken as of June 10 last year.

The transfer of the 2101 Building, graphite inventory, machine tools, instruments and other accessory equipment from Kaiser to G.E. was completed in June.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the A.E.C. during the month amounted to $2,619,000. The most significant appropriations action which took place in June was the receipt of a directive from the A.E.C. authorizing project CG-558, Reactor Plant Modifications for Increased Production. The directive authorized General Electric Company to manage the project and to incur costs in the amount of $26,800,000.

Appropriation requests approved during the month amounted to $147,165.

Liquidations of inactive status SF items were conducted on a particularly successful level in June. The first and only shipment of normal uranium contaminated bronze crucibles was made as a final clean-up of this item, approximately $185,000 in equivalent value being involved. In addition, approximately half of the $170,000 accumulation in UO_3 was recovered and returned to process channels. Release of approximately $100,000 in alloy holdings of Technical Section were released for return to production.

A representative of the SF Accountability Section visited other A.E.C. installations, reporting that receivers are now satisfied with product shipments for buttons, nitrate and shapes. The recovery of plutonium from reduction crucibles indicates that the original estimate of 82% is reasonably confirmed. Casting crucibles appear to present an unexpected problem, the cause of which is under investigation.

The Department Manager concluded in June a series of luncheons with exempt employees of the five sections comprising the department, 90 persons attending the meetings. Each luncheon was followed by a round-table discussion of subjects raised by members of the group. The meetings were held on May 19 and 26, and June 2, 9 and 16.

A representative from the Seattle office of Peat, Marwick, Mitchell and Company, certified public accountants, visited the plant on June 1 to 4 to audit certain transactions in connection with payments from the Administrative Fund.

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 $5,375,000 and $6,850,000, respectively, by the Atomic Energy Commission) for the months of June and May, 1954, is shown below:

Disbursements	June	May
Payrolls (net)	$2 826 513	$2 723 794
Materials and Freight	1 447 231	1 594 320
Payroll Taxes	650 493	768 869
Payments to Subcontractors	547 752	541 075
Group Insurance Premium	265 980	-0-
United States Savings Bonds	188 840	190 308
Pension Plan - Employees' Portion	103 841	99 067
Judgment - Connelly and Black, and Porter Cases	85 983	-0-
Travel Advances to Employees	78 409	72 536
Special Expenses for the Year 1953	-0-	151 620
Judgment in Lindell Case (guards)	-0-	95 193
All Other	104 925	204 422
Total	6 299 967	6 441 204
Receipts		
Group Insurance Experience Refund	151 640	-0-
Rent	132 629	133 647
Hospital	85 347	75 114
Electricity	66 485	81 324
Telephone	58 208	47 525
Sales to AEC Cost-type Contractors	15 610	6 570
Refund of Travel Advances to Employees	12 111	12 572
Sundry Accounts Receivable	8 420	62 371
Bus Fares	7 793	7 308
Refunds from Vendors	1 332	4 364
Other	3 982	3 266
Total	543 557	434 061
Net Disbursements	$5 756 410	$6 007 143

Outstanding advances as of June 30, and May 31, 1954, were as follows:

	June	May
Cash in Bank - Contract Accounts	$2 892 071	$3 273 481
Cash in Bank - Salary Accounts	50 000	50 000
Total	$2 942 071	$3 323 481

AUDITS AND PROCEDURES SECTION
MONTHLY REPORT - JUNE, 1954

Internal Audit

Reports were issued for the following audits:

Bank Account Reconciliations
Deposit Accounts
General Electric Suggestion Plan

A report was being prepared for the audit of cash controls. During the month, audits were begun of the following:

Revenue of the Graduate School of Nuclear Engineering
Material and Package Passes

Nine auditors were assigned during the month to work with the traveling audit staff from Schenectady.

Administrative Planning

A major project for the Administrative Planning group in June was the preparation and editing of Organization and Policy Guides required because of the organization changes scheduled for July 1. Organization and nomenclature guides for the entire organization were written and submitted to the Salary Administration Section for approval. Most of the functions and responsibilities guides required for Unit, Sub-Section and Section level positions have been received and a number, approved for publication, have been sent to the Central Printing office for printing. A revised index and numbering system was to be ready for distribution the first week in July.

Thirteen AEC transmittals were received during the month, of which three required General Electric compliance. The latter cover auditing, safety and fire protection codes and standards, and building codes and design criteria. Local General Electric officials acknowledged these transmittals.

Accounting Procedures

Four more business graduates reported for work in June, increasing to seven the number engaged in the rotational training program. Two of these men came from the University of Idaho, and one each from the Universities of Utah and Washington.

The Accounting Procedures group is making a review of accounts payable procedures to ascertain the feasibility of using vendors' invoices instead of the present voucher form, and of reducing the number of copies required from six to two.

Assistance was given to the News Bureau and the G.E. News in lining up a series of subjects for photographs to be used in the Columbia Basin News and the G.E. News for articles on the Financial Department in these

Accounting Procedures (Cont.)

publications. The G.E. News published its article, a double-page spread including 21 pictures, in the July 2 issue. In addition to the article, the News printed a montage of the functions served by the Financial Department which took up two-thirds of the front page. The Columbia Basin News story will appear in July or August.

Reimbursement Accounting

Seven letter approvals, obtained from the Commission in accordance with OPG 05.4 ("Work or Expenditures Which Require AEC Reimbursement Authorization or Letter Approval"), were received in June. Requests for assistance in the preparation of letters to the Commission and for recommendations on reimbursement problems were more numerous in June than usual.

An analysis of air express and freight shipments for the period from July, 1953, to May, 1954, inclusive, was furnished the Department Manager as a basis for calling the attention of responsible departments to the possibility of unnecessary expense for transportation by this means.

One member of the Reimbursement Accounting group has been temporarily loaned to the Project Section of the Engineering Department on a special assignment involving travel expense policies for the field inspection force. A rotational trainee has been assigned to the group during his absence.

COST AND BUDGETS SECTION - MONTHLY REPORT
JUNE, 1954

At the request of the Special Study Group, a report was prepared by Manufacturing Cost and Consolidations personnel which entailed estimating (1) the cost of operating B, D, and F Reactors after completion of pile modifications, and (2) the costs which would be eliminated if these reactors were placed in a standby or shutdown status.

Reconciliation between the General Electric Plant and Equipment - Projects Budget as submitted to HOO-AEC on April 30, 1954 and the HOO-AEC submission to Washington was completed during June and a document covering the changes was scheduled to be issued early in July.

Consolidations and Budgets Unit

A sample of a Consolidated Report for Employee and Public Relations Department was completed. The report has been adopted and will be issued monthly by General Cost Unit.

A reallocation of FY 1954 funds for procurement of Equipment Not Included in Construction Projects was made to Hanford Atomic Products Operation departments to better utilize available funds.

Engineering Cost Unit

In-Service Projects carried in "Construction Work in Progress" were closed to "Plant and Equipment In Service" during June, and Account 0650 - "Partially Completed Projects in Service" was closed out. An entry was made to reverse the cost of projects CG-488, CG-511, CG-523, K-825 and AEC-118, a portion of which were previously closed to Plant and Equipment in Service and carried in Account 0650 as soon as "Construction Work in Progress" was relieved of the cost.

A meeting was held with representatives of Minor Projects Sub-Section to review the effect of Project CG-558 on standard liquidation rates for Minor Construction. It was decided that all rates could be lowered, effective June 28, 1954. Reviews, based on latest force forecasts and schedules, will be held quarterly during the construction period of CG-558, in order to avoid excessive variances.

During the month, charts showing the financial operations of the Design Section were prepared. The charts show such items as total cost, units produced, cost per unit, number of employees, total salaries, and overtime payments.

Round Table discussions were held with all employees of Engineering Cost during the month.

General Cost Unit

In connection with the end of the fiscal year, a review of accruals, reverse accruals, suspense accounts, etc., was made and action taken to effect necessary adjustments to properly close out the year's business. Preparations are also under way to provide analysis of the full year's activities to the various department managers.

Necessary budget revisions relative to research and development programs are in process and are being discussed with the section managers involved. Budget revisions are also contemplated to reflect recent organization changes in the Employee and Public Relations Department, including the Community Operations Section, and in the Electrical Utility and Telephone Sections.

Income statements pertaining to community utilities operated by the Plant Auxiliary Operations Department and also by the Community Operations Section are being prepared for possible use in connection with the disposal of Richland Village. These statements will be retained in our files but will be available for future reference. Utilities reported on are telephone, bus, electricity, and water.

A new policy established by the Atomic Energy Commission in connection with the disposal of construction generated excess or scrap materials and equipment will have a profound effect on operating costs of the Purchasing and Stores Section. Possible adjustments to the budget of this section are being studied, and estimated savings are being calculated for submission to the AEC in accordance with their written request. These savings will be discussed with responsible operating personnel and will be submitted to the Manager - Plant Auxiliary Operations Department. Preliminary estimates indicate an annual saving of not less than $150 000 when compared with the current going rate.

Manufacturing Cost Unit

A major portion of this month's activity centered around the preparation and issuance of new Servicing Unit, Customer Unit and Account Classification codes to conform with organization changes within the Manufacturing Department. Revised code lists were issued, a number of meetings were held with Manufacturing Department personnel in the three sections, code changes on approximately 6000 work orders were begun with budget personnel assisting, a schedule for processing code changes through Computing was arranged, new IME rates were established, and revised operating report forms were prepared.

Year end adjustments were made in the inventory of essential materials to reflect physical inventory changes and to revise the valuations at June 30. Major adjustments were made in Nitric Acid, Aluminum Nitrate Nonahydrate and Helium. With the exception of Aluminum Nitrate Nonahydrate and Nitric Acid, the adjustment for which amounted to $31,400 (revised June 30 contract to date prices), the adjustment amounted to $11,700 representing 0.3% of charges to cost for the year.

The June month end inventory of essential materials was witnessed at D and DR Reactors. Conditions which required corrective action as indicated in the previous month's report had all been corrected. It was particularly noticed that the materials were very well segregated and identified.

In the Separations Section, a study of the present system of distributing the landlord cost was made to determine if the reorganization would effect the present method of distribution. The inequities found from this review were corrected and an improved method of distributing the cost on the basis of the new organization was devised.

At the request of the AEC, a cost transfer was made to include in 231 Building year-to-date costs the value of a quantity of SF Material purchased by the AEC from the Atomic Energy of Canada Limited. This amount will be shown as a line item on the 231 Building operating report, as this building was the physical point of entry into our product stream.

The Tank Farm SF Material inventory was revalued as of June 1, 1954, the value being based on the current UO_3 billing price less estimated recovery costs including depreciation, and a journal entry was prepared crediting prior year's cost and charging Work in Process Inventories. The 234-5 Inactive SF Material inventory was also reviewed and revalued in line with current billing prices as of June 1, 1954.

Overliquidations of product shipments billed at standard rates has been reduced to a negligible amount and any variance remaining as of June 30, 1954 will be absorbed in finished product inventory.

In order to test our theory that the last-in first-out inventory principles would result in a unit cost very close to the calculated current unit costs used in our monthly reports, the Product Cost Report (Top Secret) for the month of April was recast on this basis. The unit cost of Pu Nitrate resulting from this recast was within a .5% of the calculated current cost for the same period.

With the concurrence of the Reactor Section Manager, an expense account system of reporting maintenance costs in the Reactor Section was established to be effective July 1, 1954. This system has also been adopted by the Metal Preparation and Separations Sections.

GENERAL AND PERSONNEL ACCOUNTING SECTION
MONTHLY REPORT - JUNE, 1954

NARRATIVE REPORT

General Books Unit

At the close of June, unexpended advances received from the Commission amounted to $2,942,071, compared with the May 31 balance of $3,323,481. This decrease reflects a decision to reduce average cash on hand to approximately $2,500,000. Advances of $6,150,000 were requested at the end of June to cover July expenditures.

Prior to July, all cash received has been deposited in the Seattle-First National Bank. Deposits to other bank accounts were, therefore, transfers from the Seattle-First National Bank. During July, advances from the Commission will be received weekly as two checks; one for deposit in the National Bank of Commerce and one for deposit in the Seattle-First National Bank.

During June, $300,000 was received from the General Treasury Services Department due to the reduction of the du Pont Annuity Fund. This amount consisted of:

Proceeds from the sale of $150,000 face amount of U. S. Treasury 2½% Bonds due 12/15/72-67		
Principal proceeds	$149 343.75	
Accrued interest	10.25	
		$149 354.00
Withdrawals of cash in Annuity Fund		150 646.00
		$300 000.00

The reduction was possible due to terminations of former du Pont employees who would have become eligible to receive annuities had they completed 15 years of combined service.

Preparations were made for usual year-end entries to book all known costs for the fiscal year and adjust assets and liabilities for the year-end balance sheet. These entries include:

Distribution of costs included in deferred charges.
Accrual for materials and services received but not yet billed by vendors.
Adjustments of accruals for other liabilities.
Adjustments of inventory and depreciation reserves.

During the month of June 532 travel and living expense reports totaling $86,471 were booked as compared with 344 reports in May totaling $67,492 and is the largest number and amount booked in any one month in fiscal year 1954. Total charges for Travel and Living Expense Variation and Conference Expenses are shown below:

	June	May
Travel and Living Expense Variation	$ 786	$1 515
Conference Expenses	1 477	132 cr
Total charges to overhead allowance	$2 263	$1 383

Procedures were established during the month to provide adequate records and control over the securing of endorsements to automobile liability insurance policies by employees using personal cars on Company business.

Accounts Payable Unit

On June 29 and 30 special emphasis was given to the recording of all invoices received through the end of the fiscal year. Also preliminary work was performed in connection with the accrual to cost for the value of material received but not invoiced.

Vouchers processed during the month reached a new high for recent years, 5189 vouchers were recorded during June which exceeded the number booked in any one month since June of 1951.

Cash discount earned during the month amounted to $5,690; the total for the fiscal year ended June 30, 1954 was $40,691.

There was a further reduction in the Deposit Account - Returnable Containers during June, the balance as of June 30 was $25,002 as compared to the May 31 balance of $28,475.

Open contract commitments, excluding requirement contracts, amounted to $1,747,275 for the month of June of which $1,721,745 were contracts handled by Accounts Payable and $25,530 were consultant agreements reported by General Books. Disbursements relative to requirements contracts for the month amounted to $490,516.

Accounts Receivable Unit

Gross accounts receivable balances were reduced $5,432 during the month. Details of the decreases and increases are shown below:

Decreases:	
Hospital	$30 822
Cost-Type Contractors	9 495
Electricity	4 249
Telephone	2 594
Others	385
Total decrease	47 545
Increases:	
Sundry (principally tenant service)	29 978 (1)
Rent	10 632 (2)
Safety Shoes	1 503
Total increase	42 113
Net decrease	$ 5 432

(1) Includes debit accounts payable vouchers amounting to $20,857 transferred to accounts receivable at June 30, 1954.
(2) Excludes credit accounts receivables amounting to $9,579 transferred to accounts payable at June 30, 1954.

During the month, accounts determined uncollectible amounting to $1,411 were written off and assigned to the Atomic Energy Commission. Of the total, $1,048 represented uncollectible Kadlec Hospital Accounts, and $363 represented rental, tenant service and utility accounts. Collections on accounts previously written off amounted to $186, resulting in a net charge to the Reserve for Bad Debts of $1,255.

The General Ledger balance of Accounts Receivable - Kadlec Hospital decreased $30,822 during the month resulting in a balance of $97,753 at June 30. This represents the lowest balance in this account since January 31, 1949 when the General Ledger balance was $94,700. This reduction is due primarily to continuing good collections, and a considerable reduction in the Hospital census during May and June, 1954.

Personnel Accounting Unit

Traveling auditors from the Auditing Services Department audited the reconciliations of Salary Bank Account No. 2, the base rates of approximately 500 monthly-paid employees including two-platoon firemen, and exempt overtime worked in March and paid in April.

Comparative statistics concerning employees on the payroll and off the payroll for lack of work as of June 30, 1953 and 1954 were supplied to Schenectady.

With respect to the general salary increase of June 10, 1954, the following items were accomplished:

a. Current payment of the increase was made to all non-unit nonexempt personnel and to members of Local 21 of the International Guards Union of America in salary payments for the week ended June 13, 1954.

b. Current payment of the increase, with the retroactive adjustment for the period June 10 through June 13, was made to members of the Building Service International Union in salary payments for the week ended June 20, 1954.

c. New rates were established and are being maintained in a duplicate IBM master file to apply both current and retroactive payment of the increase to members of the unions in the HAMTC as soon as Modification No. 4 to the Agreement between the HAMTC and General Electric Company has been ratified by the unions composing the HAMTC.

d. Current payment of the increase was made to all exempt employees in salary payments for the month of June.

e. New rates for all nonexempt jobs were calculated and verified with Wage Rates.

f. Base rates of all exempt employees as of May 31, 1954, and new pay rates were verified with Salary Administration.

The estimated annual cost of the general salary increase amounts to $1,221,000, exclusive of overtime, or an over-all hourly increase of $0.068. Increased annual cost of overtime, based on the preceding 11 months' overtime experience, is estimated at $33,000.

In the Community Firemen legal cases:

a. Payment of the judgments in the Porter case in the net amount of $35,051 was made to the Clerk of the United States District Court, Eastern District of Washington, at Yakima on June 30, 1954.

b. Individual calculations of salaries of $12,000 in the Canfield case were given to the Legal Department on June 4, 1954.

c. The calculations in the Rivers case were completed.

In the Guards legal cases:

a. Payment of the judgment in the Connolly and Black case in the net amount of $50,933 was made to the Clerk of the Superior Court, Franklin County, Washington, at Pasco on June 8, 1954.

The following Reimbursement Authorizations were received during the month of June:

R. A. No.	Subject
226	Revision of R.A. No. 177 - Exempt Overtime
227	Additional classification of Graphic Designer 3.
228	Patent Bonus Payments
229	General Salary Increase - Exempt Employees
230	General Salary Increase - Nonexempt Employees

The following revised Organization and Policy Guides covering payroll matters were issued:

OPG No.	Subject
13.1	Vacations
18.7	Overtime

Office Letter No. 198, issued June 28, 1954 on the subject "Independence Day Holiday" covered instructions on the time card schedule for the week ended July 4 and weekly salary check distribution for that week.

Round-table discussions were held by supervisors with nonexempt employees during the month of June.

STATISTICS

General Books Unit

	June	May
Travel Advance Account		
Cash Advances - Beginning of Month	$82 915	$91 105
Advances During the Month	78 408	72 536
Expense Accounts Submitted	86 784 Cr.	67 492 Cr.
Adjustments	-0-	662 Cr.
Cash Refunded	12 111 Cr.	12 572 Cr.
Cash Advances - End of Month	$62 428	$82 915
Outstanding Travel Advances		
Current	$57 953	$72 026
Over 30 Days	4 475	10 889
Total	$62 428	$82 915
Travel and Living Expenses		
Actual Expenses	$82 146	$65 980
Billed to Government	79 884	64 589
Balance in Variation Account at End of Month	-0-	5 286 Dr.

Accounts Payable Unit

	June	May
Accounts Payable Balance-Beginning of Month	$ 576 987	$ 509 047
Vouchers Entered During Month	3 687 903	3 590 677
Vouchers Paid During Month	3 284 614 Dr.	3 527 101 Dr.
Cash Receipts	1 332	4 364
Year End Accruals J.E.'s 6115, 6062, 6043, 6022	190 022	
Accounts Payable Balance - End of Month	$1 171 630	$ 576 987
Number of Vouchers Recorded	5 189	4 327
Number of Checks Issued	2 611	2 987
Number of Freight Bills Paid	1 669	1 546
Amount of Freight Bills Paid	$ 425 483	$ 385 537
Number of Purchase Orders Received	2 483	2 370
Amount of Purchase Orders Received	$1 528 913	$1 867 356

Accounts Receivable Unit

Account	Balance 5-31-54	Net Charges	Collections	Balance 6-30-54	Number of Bills Issued During Month
Hospital:					
Active	$118 707	$ 60 166	$ 91 906	$ 86 967	1 478
Collection Agency (70 Accounts)	9 868	939	21	10 786	
Sundry:					
Active	29 172	37 941-a)	8 874	58 239	393
Collection Agency (112 Accts) -c)	5 362	911		6 273	
Rent	27 287	409 975-b)	399 343	37 919	6 896
Electricity	41 266	62 783	67 032	37 017	3 909
Telephone	35 843	56 881	59 475	33 249	6 381
Equipment sales to Facilities (1 acct)	25 826		349	25 477	
Cost-Type Contractors	24 072	6 115	15 610	14 577	31
Safety Shoes	1 378	4 438	2 935	2 881	278
Loans to Employees (4 accounts)	670		36	634	
Sub-total	$319 451	$640 142	$645 581	$314 019	19 366
Reserve for Bad Debts	26 468 Cr.			30 050 Cr.	
General Ledger Balance	$292 983			$283 969	

(a- Includes debit accounts payable vouchers amounting to $20,857 transferred to accounts receivable at June 30, 1954.

(b- Excludes credit accounts receivables amounting to $9,579 transferred to accounts payable at June 30, 1954.

(c- Includes all utility and rental accounts

Personnel Accounting Unit

Number of Employees Changes During Month	Total	Monthly Payroll	Weekly Payroll
Employees on Payroll at beginning of month	8 605	2 308	6 297
Additions and transfers in	201	7	194
Removals and transfers out	(115)	(16)	(99)
Transfers from weekly to monthly payroll		15	(15)
Transfers from monthly to weekly payroll		(1)	1
Employees on Payroll at end of month	8 691	2 313	6 378

Overtime Payments During Month	June Number	June Amount	May Number	May Amount
Weekly-Paid Employees	5 308	$100 261-a)	5 421	$ 79 145-a)
Monthly-Paid Employees	341	28 677	375	24 734
Total	5 649	$128 938	5 796	$103 879

Number of Changes in Salary Rates and Job Classifications	June	May
Temporary changes	270	71
Retroactive changes	41	3
Normal changes	838	669
Total	1 149	743

Gross Payroll Paid During Month	June	May
Engineering	$ 798 682	$ 783 564
Manufacturing	1 733 289	1 652 347
Plant Auxiliary Operations	819 002	813 779
Other	704 099	685 628
Total	$4 055 072-a)	$3 935 318-a)

(a- Payments to weekly paid employees are for four week periods.

Employee Benefit Plans Participation in Benefit Plans at Month End	Number Participating June	Number Participating May	June	May
Pension Plan	7 951	7 924	97.8%	97.7%
Insurance Plans				
Personal Coverage	8 612	8 519	99.1	99.0
Dependent Coverage	5 997	5 949	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 268	4 242	49.1	49.3
Savings Plan	1 109	1 109	12.8	12.9
Both Plans	4 862	4 845	55.9	56.3

Pension Plan	June	May
Number Retired	4	8
Number who became eligible for participation	84	44
Number who applied for participation	79	43
Number who elected not to participate	5	1

Insurance Plan - Number of Claim Payments		
Employee Life Insurance	3	1
Employee Accident & Health Insurance	545	499
Dependent Accident & Health Insurance	487	513
Total	1 035	1 013

	June	May
Good Neighbor Fund		
Number Participating	5 777	5 715
Percent of Participation	66.5%	66.4%
Suggestion Awards		
Number of Awards	13	2
Total amount of Awards	$ 410	$ 735
Preferential Rates		
Number (eliminated) or added	(28)	(5)
Number Currently in Effect	587	615
Number of Military Allowance Payments		
Number	8	2
Number of Payroll Deductions - Other than Taxes		
Barracks Rent	10	15
Dormitory Rent	497	520
Good Neighbor Fund	9 689	9 696
Hospital	448	505
House Rent	5 052	5 112
Insurance	8 444	8 504
Pension	25 200-a)	24 400-a)
Safety Shoes	452	450
Savings Bonds	14 892	15 043
Trailer Space	144	144
Union Dues	1 900	1 847
Other	176	163
Total	66 904	66 399

(a- Approximate numbers.

Plant Accounting Unit

Facilities reclassified as not in service were transferred to the appropriate plant and equipment accounts describing their use status as part of annual closings. Major components of the 234-5 facilities were removed from service and retired from the books. Amounts transferred and retired from plant and equipment in service are summarized as follows:

(In Thousands)

	TRANSFERRED TO			
	HELD FOR FUTURE USE	NOT USED OR USEFUL	RETIRED	TOTAL
200 North Areas (N and P)	$	$ 1,117	$	$ 1,117
200 East Area				
Portions of B Plant	4,014			4,014
Heat Treating Facilities	72			72
Fire Headquarters		42		42
234-5 Equipment	2,124	1,258	2,601	5,983
Totals	$ 6,210	$ 2,417	$ 2,601	$ 11,228

The portion of B Plant transferred to plant and equipment held for future use includes: 224-B - Bulk Reduction Plant; 271-B - Chemical Preparation; 291-B - Exhauster Building; and 292-B - Stack Monitoring Facility and all related equipment.

Charges to extraordinary depreciation and obsolescence as a result of reclassification and retirement of equipment was $3,700,000, of which $1,910,000 was applicable to equipment retired and $1,790,000 applied to facilities transferred to plant and equipment not used or useful.

Total depreciation expense for the month of June was $4,032,000, as compared to $6,291,000 for the month of May. The reduction in June depreciation expense resulted from revision of the rate of depreciation applicable to TBP facilities.

The cost of projects which were in service or in the hands of operations at June 30, 1954, were closed to plant and equipment in service even though the projects were not physically or financially complete. Major projects transferred were: Hanford Works Laboratory Area, Biological Laboratory in 100-F, and Stores Receiving Warehouse. Final unitization of TBP facilities was completed and costs were distributed to classified plant and equipment in service.

Rates of accruing depreciation on the TBP facilities were revised during the month to conform to the remaining usefulness of the facilities. Depreciation accruals in the future, based on revised rates, will approximate one third the amount of past accruals.

Plant Accounting Unit (Continued)

Two separate reports listing total square foot area of real property at Hanford were completed during the month. A report to AEC, based on facilities in use December 31, 1953, reported a total of 9,751,000 square feet. Included in this amount was total space occupied for office, institutional, community residences, storage warehouses, industrial and service facilities. The report issued to Manager-Manufacturing Plant Utilization in Schenectady summarized a total of 4,474,000 square feet representing industrial facilities only. The amount reported to AEC exceeds the amount reported to General Electric by 5,277,000 square feet. General Electric figures exclude areas applicable to community real property (5,391,000) and include industrial areas to be placed in operation by July 2, 1954.

Reserve for depreciation accounts was reviewed and adjustments in the amount of $110,437 were made in all cases where reserve accruals exceeded recorded first cost. A reserve for spare equipment held in storage was established at the close of the fiscal year in the amount of $383,000, representing twenty-five percent of first cost.

Plant and equipment increased by $14,092,000 over last month's balances, resulting principally from expenditures applicable to new construction. Changes in construction work in progress are as follows, as reported by -

	(In Thousands) LAST MONTH	CURRENT MONTH	NET CHANGE
Kaiser Engineers	$ 93,142	$100,653	$ 7,511
Blaw-Knox	23,086	27,851	4,765
Atomic Energy Commission	33,102	18,437	(14,665)
General Electric Company	29,947	31,916	1,969
Total	$179,277	$178,857	$ (420)

The total plant and equipment at June 30, 1954, is summarized as follows:

	(In Thousands) ASSET	RESERVE	NET
Completed Plant and Equipment	$735,503	$275,080	$460,423
Construction Work in Progress	31,916		31,916
Total Cost Recorded (GE Books)	767,419	275,080	492,339
AEC and Other Contractor Costs			
Land and Land Rights	5,476		5,476
Construction Work in Progress	146,941		146,941
Total	$919,836	$275,080	$644,756

During the month one employee was transferred to Manufacturing Department-Separations Section, one employee terminated and two new hires were added, resulting in a total of 36 employees at June 30, 1954, comprising 6 exempt and 30 non-exempt.

Inventory Accounting Unit

The annual physical inventory of excess materials and equipment was taken as scheduled as of June 2, 1954. Preliminary results indicated a net shortage of $58,000. Work is still under way to determine reasons for the shortage, but it appears that the variance is due to an over-valuation of the physical inventory taken last year, as of June 10, 1953. Tentative results of this inventory are summarized below:

	Excess Materials	Excess Equipment	Total
Physical Inventory	$1,282,526	$2,013,000	$3,295,526
Reconciled General Ledger Balance	1,340,872	2,012,928	3,353,800
Net Overage (Shortage)	$ (58,346)	$ 72	$ (58,274

Report covering final results of this inventory is expected to be issued some time in July, 1954, after Internal Audit Unit has completed its audit of the physical inventory reconciliation and working papers.

Following is a schedule and results of all other physical inventories which have been completed to date:

	Date Taken	Reconciled Book Value	Physical Inventory Value	Over (Under) Book Value
Fuel and Lubricants	1-20-54	$ 15,603	$ 15,545	$ (58)
Coal (all)	3-31-54	1,969,930	2,023,838	53,908
Essential Materials (Excluding Coal)	4-31-54	1,594,443	1,551,958	(42,485)
Electrical & Telephone (Excluding Service Trucks)	5-20-54	74,278	85,445	11,167

Reports on the above physical inventories have been completed and issued to personnel concerned.

Preliminary arrangements were made with Transportation Section to take physical inventory of railroad materials on July 28, 1954. This included meetings with personnel from Transportation Section to establish time schedules, procurement of necessary manpower, and location of materials. The meeting also included a discussion concerning the anticipated transfer to general supplies of all general use items currently booked as spare parts.

Arrangements were completed for the transfer of approximately 2,500,000 pounds of graphite from construction work in progress to inventories - special materials. A. M. Waggoner's letter, subject "Valuation of Graphite Inventory," recommended that graphite inventory be priced at $ .4405 per pound, and also stated that, if at some future date the inventory proves valueless, it may be written off to prior years costs.

Inventory Accounting Unit (Continued)

A new policy with regard to the handling of excess material and equipment and the reserves therefor was established by AEC during the month of June. Kaiser and Blaw-Knox will handle their own excess material and equipment, and no charges generated by these contractors in handling or disposing of their excess material and equipment will be charged to the General Electric reserve.

Effective June 1, at the request of the Commission, General Electric Company will maintain on its books the reserve for loss on excess materials and equipment for all of the Commission requirements except Kaiser and Blaw-Knox; prior credits on the books of the Commission are to be transferred before the end of fiscal year 1954.

The reserve for excess materials and equipment was adjusted at June 30, 1954, to 80 percent of the gross book value, and spare parts and equipment reserve adjusted to 25 percent of the gross book value. During the year excess materials and equipment have been reserved at 100 percent and spare parts reserve was established last year at 30 percent of the gross book value. Prior to June 30, 1954, there was no reserve for spare equipment held in storage.

Spare parts inventory was written down $6,500 during the month as a result of the continued study, based on current market values, of spare parts fabricated by General Engineering Laboratory, in connection with spares for the RMA and B lines. Total write down, to date, as a result of this study, has been $58,500. In addition, electrical materials classified as general-use items, valued at $52,400, which were booked as spare parts inventory, were transferred to general supplies.

Following is a summary showing inventory account balances for the months of May and June, 1954, together with the amount of change:

	(In Thousands) Book Balance		Increase
	5-31-54	6-30-54	(Decrease)
Current Inventories			
General Supplies	$ 976	$ 1,334	$ 358
Fuel and Lubricants	71	71	-0-
Essential Materials	3,404	3,568	164
Total Current Inventories	4,451	4,973	522
Special Materials	357	1,424	1,067
Spare Parts	2,578	2,648	70
Excess Materials	1,356	1,359	3
Total Inventories - Gross	8,742	10,404	1,662
Less: Spare Parts Inventory Reserve	(485)	(662)	177
Excess Inventory Reserve	(1,355)	(1,087)	(268)
Total Reserve	(1,840)	(1,749)	(91)
Total Inventories - Net	$ 6,902	$ 8,655	$ 1,753
As a Memo:			
Spare Equipment Held in Storage	$ 1,609	$ 1,534	$ (75)
Excess Equipment	2,128	2,208	80
Excess Equipment Reserve	(2,111)	(1,766)	(345)
Spare Equipment Held in Storage Reserve	-0-	383	383

Inventory Accounting Unit (Continued)

The increase of $1,662,000 in gross value of inventories during the month over the value at the end of the previous month is primarily due to the transfer of graphite from construction work in progress, accrual for materials received and not billed on General Electric and Atomic Energy Commission purchase orders, and the increase booking of purchases at the close of fiscal year 1954.

The addition of two employees during the month increased total personnel to 9 non-exempt and 4 exempt, aggregating 13. One of the new employees is a replacement for an employee who is terminating the second week in July.

Property Management Unit

Work on the lay-up of the machine tools in the 2101 Building has been completed. However, the Engineering Department now has under consideration a project to reopen about one third of the line to meet certain Technical Section requirements.

A review is being made of the condition and use of all plant buildings and their facilities in order that our property records may reflect the correct plant category and condition status. As a result of this review, it appears desirable to establish a plant policy in regard to the control of equipment in laid-up facilities. A tentative Organization and Policy Guide has been prepared on this subject and presented to interested management for comment.

Seventy-five requests for the disposal of property were investigated, processed and approved during the month.

Thirty-one appropriation requests totaling $147,165 were approved during the month.

Appropriations Unit

Project proposals and informal requests which were processed by the Appropriations Unit and directives issued by the Commission during the month of June are shown in the following list:

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 and authorization to proceed with construction of the facility was approved by the AEC. Work authority dated June 8 authorized GE $64,000.

CA-548 - New VSR Tower

Project proposal requesting $95,000 to provide testing facilities for vertical slot equipment was forwarded to the AEC June 14.

Appropriations Unit (Continued)

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

Project proposal requesting $240,000 for design engineering, procurement and site preparation of the RMA Line which is located in Rooms 232-233 of the 234-5 Building was approved by the AEC April 29, 1953. Revised proposal requesting total funds of $500,000 for this project was forwarded to the AEC June 9.

CG-558 - Reactor Plant Modification for Increased Production

AEC directive dated June 15 authorized GE to manage the project and to incur costs in the amount of $26,800,000. In general the directive authorized all necessary design work for installation of instrumentation for all six piles and water plant modifications for the five older piles, procurement of instrumentation equipment for all six piles and water pumping equipment for B, D, and DR, and the installation and construction work.

CG-572 - Particle Problem - Animal Exposure

Due to the complexity of the inhalation problem, the project was divided into two phases. Phase I requested $22,500 for installation of small animal exposure facilities. Phase II requested additional funds in the amount of $57,500 for installation of large animal exposure facilities. Project proposal requesting total funds in the amount of $80,000 was forwarded to the AEC June 18.

CG-573 - Hanford 3X Program - 300 Area

Proposal requesting $800,000 for initiation of project was approved by the AEC January 15. Revised proposal presenting a complete description of the new scope, justification for the work completed and remaining, and a request for additional funds in the amount of $160,000 (total funds $960,000) was approved by GE June 10 and forwarded to the AEC. Directive dated June 25 authorized $860,000 to complete the project in accordance with a further revised scope which excluded iridite facilities for can preparation prior to hot pressing, facilities for recovery of SF material from process solution, and ultrasonic bond test equipment.

CG-576 - General Improvements to Laboratory Area Building

Project proposal requesting $60,000 to provide facilities necessary to carry out the adjusted programs as presently established for Pile Research and Development Building was approved by the AEC February 19. Revised proposal requesting additional funds in the amount of $205,000 to correct inadequacies of the Laboratory Area facilities resulting from work program changes for the Technical Section, space reassignment and design deficiencies was approved by the A & B Committee April 12 and forwarded to the AEC. The revised proposal was returned unapproved by the AEC June 23 with the request that another proposal be submitted which is consistent with recommendations contained in their attached six page report setting forth comments, suggestions and objections to a number of specific items of work.

Appropriations Unit (Continued)

CG-584 - Moisture Monitoring System for Detection of Leaking Process Tubes - 105-C

Proposal requesting $59,000 for design, fabrication and installation of moisture monitoring equipment in the 105-C Building to automatically detect, record, and signal the presence of water in the reactor gas system was approved by the AEC June 29.

CA-586 - First Capacity Increase - 230 KV Line

Project proposal requesting $1,390,000 (GE $65,000) to supplement the existing 230 KV electrical transmission system with an additional transmission line, including necessary breakers and terminal equipment, from the Bonneville Power Administration Midway Station to the Hanford Production Areas, was forwarded to the AEC June 2.

CG-588 - Ammonia Scrubbers, Redox

Proposal requesting $175,000 (including $10,000 authorized for initiation of design) to provide ammonia scrubbing equipment in the Redox plant for the purpose of minimizing the emission of contaminated ammonia nitrate particles from the stack was forwarded to the AEC June 8.

CG-589 - Dejacketing and Ultrasonic Equipment Metal Examination Facility - 105-C

Project proposal requesting $152,000 to provide chemical dejacketing and ultrasonic grain size determination equipment in the Metal Examination Facility in the 105-C Building was forwarded to the AEC June 2.

CA-590 - Fly Ash Collection Equipment - 384 Building

Proposal requesting $33,500 to install equipment for collecting the fly ash from the induced draft fan exhaust and to transport it to the base of the existing 150 foot natural draft stack where it will be sluiced away was forwarded to the AEC June 14.

CA-591 - Fire Detection and Alarm System - 234-5 Building

Project proposal requesting $87,000 for design, procurement and installation of a fire detection and alarm system in the 234-5 Building was forwarded to the AEC June 16.

CG-592 - 300 Area Laboratory Supply Space - 325 Building

Proposal requesting $56,000 for storage facilities for Caption 10, Laboratory Supplies and Chemicals, was forwarded to the AEC June 18.

CG-593 - Discharge Area Viewing Facilities - 100-B Area

Project proposal requesting $35,500 for installation of a closed circuit television system to provide operating personnel with a means of viewing the discharge face of the reactor from the Control Room and the front face elevator was forwarded to the AEC June 18.

SF ACCOUNTABILITY SECTION
MONTHLY REPORT - JUNE, 1954

The revised Normal Uranium Account control was placed in operation on June 1, 1954. Further development of accounting controls include a proposed Standard Journal Entry System for 234-5 Building (Metal Fabrication) and for internal reports covering production data for the same process.

Manual revisions include a new Normal Uranium Section now 95% complete and scheduled for release in July 1954. Concurrent with the final release of this manual section, the SF Accounting portions of the 234-5 Process have been completed and are now being typed. The Measurement Methods portion of this manual have already been completed as well as Isolation Building (231). Measurement Method's data for Redox is now under development.

Liquidation of Inactive Status items were conducted on a particularly successful level in June. The first and only shipment in ten years of Normal Uranium contaminated Bronze Crucibles was made as final clean up of this item. Approximately $185,000.00 equivalent value was involved. In addition, approximately half of the $170,000.00 accumulation in UO_3 was recovered and returned to process channels. Release of approximately $100,000.00 in alloy holdings of Technical Sections were released for return to Production.

Two items associated with Inactive Status Plutonium were also developed to the point where early liquidation now appears feasible. Reduction crucibles contribute the major dollar value. Of much lower monetary value but presenting Security aspects of importance - the adjustment tank A.T. Samples have been a continuing problem. It now appears feasible to eliminate this item by product recovery.

Metal Recovery operations continued at 234-5 Building with recovery at a cumulative level of 98.65%. Recent operations have caused the increase in percentage recovery to rise one to two tenths per month. In view of the diverse nature of the material present status is particularly satisfactory.

Trip report of C. J. Shortess, Jr., indicates Receivers are now satisfied with product shipments for Buttons, Nitrate and Shapes. The recovery of plutonium from Reduction Crucibles indicates the original estimate of 82% is reasonably confirmed. Casting Crucibles appear to present an unexpected problem, the cause of which is currently under investigation.

Restriction of the Mint Program has drastically altered 300 Area activities with 100 Area movements tapering off for ultimate elimination.

Two important control procedures were placed in operation covering (a) Separations Performance - a Measurement Method evaluation program and (b) SF Process Flow ratios which have now been extended to cover all major process flows.

SF Physical Inventory audit activities were conducted on an increased level during June, specifically directed towards cooperative activities with the US AEC - Hanford Operations Office in conjunction with Survey #11. In addition, Engineering Inspection functions were placed in operation while cooperative activities were provided to General Electric Internal Auditors and to members of the Traveling Auditors staff.

A major change in procedure was completed relative to routing of SF invoices necessitated by the organizational change within the US AEC. This change related to the transfer of functions from the New York Operations Office to Oak Ridge.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION
JUNE 1954

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning of month	369	373
Additions and transfers in	19	4
Removals and transfers out	(13)	(8)
Employees at end of month	375	369
Personnel by Unit at Month-End		
General	7	7
Audits and Procedures Section		
Accounting Procedures	2	1
Administrative Planning	3	2
Internal Audit Unit	14	15
Reimbursement Accounting	3	3
	22	21
Cost and Budgets Section		
Consolidations and Budgets Unit	8	7
Engineering Cost Unit		
General	5	6
Design Section Costs	7	7
Project Section Costs	16	17
Technical Section Costs	11	10
General Cost Unit		
General	2	1
Community Operations and Real Estate	8	8
Medical	3	3
Plant Auxiliary Operations	16	17
Radiological Sciences and others	8	7
Manufacturing Cost Unit		
General	2	2
Analysts	10	10
Budgets and Control	15	16
Records and Reports	14	14
	125	125
General and Personnel Accounting Section		
Accounts Payable Unit	33	33
Accounts Receivable Unit	20	22
General Books Unit	20	19
Personnel Accounting Unit		
General	2	2
Confidential Payroll Records	7	7
Employee Benefit Plans and Payroll Reports	20	19
IBM Procedures	1	1
Preparation and Employee Records	28	28
	131	131

	Current Month	Prior Month
Property Accounting Section		
Appropriations Unit	5	5
Inventory Accounting Unit	13	11
Plant Accounting Unit	34	36
Property Management Unit	3	3
Work Review Committee	2	2
	57	57
SF Accountability Section		
Measurement Methods Unit	5	5
Process Flow Unit	4	2
SF Accounting Unit	3	4
SF Records and Reports Unit	14	14
	26	25
Rotational Trainees	7	3
	375	369

PLANT PROTECTION SECTION

MONTHLY REPORT - JUNE 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	98	98 (a)		
Security and Patrol	499	496		3 (b)
Fire Protection	137	136		1 (c)
Office Unit (Laundries, Clerical and Records Control)	190	206	16 (d)	
TOTALS	926	938	16	4

NET INCREASE: 12

(a) - Administration Area Maintenance
- 2 - New Hires
- 1 - Reactivated
- 3 - Transferred out

(b) - Security and Patrol
- 2 - Rehires
- 4 - Transferred in
- 7 - Transferred out
- 2 - Terminations

(c) - Fire Protection
- 1 - Termination

(d) - Laundries
- 1 - New Hire
- 1 - Reactivated
- 1 - Transferred in
- 1 - Transferred out

Clerical Services
- 31 - New Hires
- 1 - Transferred in
- 1 - Reactivated
- 15 - Transferred out
- 1 - Deactivated
- 3 - Terminations

FIRE PROTECTION UNIT

There were five operations fires during the month including two grass fires. Damages amounting to $1600 to tires and wiring were incurred on a tank truck engaged in fighting a grass fire on June 20, 1954. Losses in other fires were negligible.

Eleven fire calls to construction areas were answered, eight of which were false alarms. The majority of false alarms were caused by malfunctioning alarm system in construction area.

Officers of the Fire Protection Unit held 20 meetings on artificial respiration which were attended by 377 operations employees.

Drills held during June

Outside drills held	126
Inside drills held	115
TOTAL	241

Fire Extinguishers

Inspected	1,335
Installed or relocated	10
Tested	664
Delivered to new locations	8
Seals broken and not reported	14
Serviced	725
Weighed	706

Gas Masks

Inspected	35
Serviced	9

OFFICE UNIT

Laundries

200-West Laundry	May	June
Pounds Delivered	247,803	237,751
Pounds Rewashed	14,084	14,212
Total Dry Weight	261,887	251,963

Monitoring Section - 200-W Laundry	May	June
Poppy Check - Pieces	222,445	241,408
Scaler Check - Pieces	319,647	340,501
Total Pieces	542,092	581,909

700 Area Laundry

Flatwork - Pounds	39,528	31,584
Rough Dry - Pounds	54,204	38,197
Finished - Pounds	2,522	2,163
Total Weight	96,254	71,944
Estimated Pieces	126,092	94,246

Clerical Services

Central Mail and Addressograph

Inter-office mail showed a slight increase in volume and postal mail decreased slightly.

The 300 Area Mail room was moved from 3760 Building to 3703 Building with no interruption in service.

Addressograph work has been exceptionally heavy during the past period due to the release of Organization and Policy Guides and numerous news releases.

Types and Pieces of Mail handled	June	May
Internal	3,525,188	3,326,071
Postal	81,951	90,092
Special	2,349	1,994
Registered	1,250	1,414
	3,610,738	3,419,571
Total postage used	$3,463.03	$3,520.10
Total teletypes handled	2,995	2,904
Total Store Orders handled	828	847

Addressograph

Type of List	June Number of Runs	June Total Copies	May Number of Runs	May Total Copies
Plant name list	115	163,326	113	159,398
Housing list	28	83,562	26	63,250
Payroll list	11	37,235	14	29,855
Total new plates		1,985		2,643
Total Corrected plates		4,365		4,421
		6,350		7,064

Office Equipment-Furniture

Purchase orders for office furniture and cafeteria equipment required for new transportation facilities, Project AEC-114, have been placed to cover those items not available from warehouse stock. Delivery schedules have been requested for September 1, 1954.

Office furniture and machines in 2101 Building were picked up and returned to stock for reassignments. Eighteen machines were returned from this unit.

Activity in office furniture during the month was as follows:

Item	Received by Credit S.O.	Issued	Salvaged
Blackboard	0	6	1
Bookcase	2	7	0
Chair	125	94	24
Costumer	3	4	1
Card Files	23	3	0
Cabinet	69	100	3
Desk	97	43	8
Table	44	23	1
Misc.	187	131	0
Vault Type safe	0	1	0
Total	550	412	38

The 38 pieces of furniture salvaged consisted of chairs, desks, tables and filing cabinets that have been worn through fair wear and tear.

Appropriation Request 54-S-56 was issued and approved. This appropriation was the last request for FY-54 operational requirements. Appropriation Request 54-S-42 was issued and approved for office furniture requirements in 100-K Area facilities. Requisitions have been issued to cover those items not available from Hanford stocks.

Office Machines

Two Burroughs Sensimatic bookkeeping machines were received. One will be assigned to Accounts Receivable for posting telephone billings and one will be assigned to General Accounting to replace two Underwood Elliott Fisher machines which will be excessed.

Six machines destroyed in Blaw-Knox fire were processed on P.D. form by AEC and machines were retained in warehouse to salvage spare parts before destroying.

There were fifty-four machines issued and seventy-two machines returned to stock from service during the month.

Office Machine Repair

A total of fifty-two office machines damaged in the recent Blaw Knox fire have been repaired and returned to the Blaw-Knox Company during June. Blaw-Knox work load in the 200-East Area has decreased considerably due to the moving of a section of their operation to the 3000 Area Building 87.

Instrument maintenance men completed the relocation of all 706 Bio-Assay Laboratory instruments to their new building in the 700 Area.

Central Printing

GE Security was invited to observe and evaluate a method of removing photographic images from metal plates which appears to work out satsifactorily. The thought behind the demonstration being that classified information can be deleted from metal plates which if approved by responsible authorities, could save much valuable file space at Classified Files and do away with the presently employed burning method by Security Personnel.

A large printing and collating job was completed for Housing during June, consisting of a 300-page Vacant Lot Survey.

Work Completed	June	May
Orders received	361	372
Orders completed	369	300
Back log	99.8	76
Copies printed	1,506,719	1,064,904
Negatives masked	870	668
Negatives processed	946	700
Photo copy prepared	182	140
Litho plates processed	1,035	813

Stenographic Services

Transcription of twelve tape recordings for AEC of Congressional Hearing before the Joint Committee on Atomic Energy was started on June 22. It is expected that this assignment will be completed by June 30.

Numerous Organization and Policy Guides on functions and responsibilities were typed throughout the month for various sections.

Twenty-nine new employees were assigned to the Stenographic Pool in June. Twenty-six of these are 1954 high school graduates and are classified Stenographer-Typists. Fourteen transfers were effected during the month.

Loan assignments, due to vacation relief requests, were unusually heavy and due to influx of new employees, it was possible to fill thirty-nine of these requests.

Breakdown of Hours	June	May
Dictation and Transcription	0	3.0
Machine Transcription	38.5	55
Letters	34	19
Rough Drafts	198	91
Dittos, Duplimats and Xerography	427.5	431
Miscellaneous	462	372
Holiday Time	64	0
Training Time	372.5	102.5
Absentee Time	13.5	4
Unassigned Time	211	27
Total	1,821	1,104.5
Employees on loan to other units	1,520	816.5
Grand Total	3,341	1,921

Area Mail and Duplicating

Arrangements completed this month will make possible the installation of improved Xerographic equipment in Duplicating, 703 Building. The new unit successfully handles transfers from originals on which there are large solid areas, or half-tones. It also provides a more efficient storage arrangement for supplies, which should reduce waste.

On June 21, an exhaust fan was installed in the 1704-H Duplicating Office in the 100-H Area. This fan is of new design, permitting it to be turned 180 degrees, and used to improve air circulation within the room when necessary.

Orders have been placed for an additional Verifax Printer and an office type Ozalid contact printer to be installed in the 3760 Building Duplicating Office in the 300 Area. This equipment will be used to duplicate copies of documents needed subsequent to their original issuance by Classified Files. The procedure will enable Technical Information to effect considerable savings, since the need for vault space, presently used to store extra copies of documents will be greatly reduced. Floor space for the additional equipment has been made available by moving mail handling equipment to 3703 Building.

All vehicles assigned to Area Mail operations have been equipped with window decals identifying them as carriers of mail. It is believed that this step will eliminate confusion, and enable members of Security Patrol to more easily recognize such trucks and to assure constant security control.

Duplicating and Mail Statisitics	June	May
Orders received	3,234	3,047
Orders completed	3,167	3,000
Orders on hand	67	42
Offset plates	15,128	17,497
Offset copies	862,222	850,010
Stencils	254	1,064
Stencil copies	2,906	75,574
Ditto masters	247	491
Ditto copies	4,795	11,284
Verifax masters	1,447	1,362
Verifax copies	4,493	3,206
Xerox plates	1,837	1,320
Internal Mail	451,081	185,981

Records Control

Quantity of records received, processed and stored:

Employee and Public Relations Department	1	Standard	Storage	Cartons
Engineering Department	67	"	"	"
Financial Department	97	"	"	"
Manufacturing Department	47	"	"	"
Plant Auxiliary Operations Department	75	"	"	"
Radiological Sciences Department	9	"	"	"
Sub-Contractors				
Vitro Corporation	6	"	"	"
TOTAL	302	Standard	Storage	Cartons

Persons provided records service: 705

Cartons of records destroyed: 19

Records Cartons issued: 316

Percentage of Records Service Center vault (exclusive of North Richland) occupied by records is 85.4%.

Twenty-two requests for file cabinets were received; 16 requests were filled; six requests were cancelled. No requests are pending. Seven combination locked cabinets and fourteen key locked cabinets were picked up with no exchange and returned to stock for reissue.

One "Request for Authorization for Records Disposal" was submitted to the Atomic Energy Commission for approval. Twenty-three requests for authorization for records disposal were returned approved by the Atomic Energy Commission.

Uniform filing was established in two offices during the month. A total of 483 offices have installed the system to date. Eight rechecks were made on established files.

ADMINISTRATION AREA MAINTENANCE UNIT

AEC-114 New Transportation Facilities: Scheduled completion 92%, actual completion 76 %.

Main Shop Building: Wall panel placement complete; block wall laying 80% complete; floor slab placement 90% complete; roof framing and sheathing complete; built-up roofing 50% complete; hoists in heavy equipment and light maintenance shop installed and tested; jib cranes in heavy maintenance and motor room areas installed; hoist posts for paint room installed (contractor has adked for 120 day extension in this area); overhead door installation 75% complete; light fixtures are being hung in Units "B" and "C".

Dispatcher Building: Building complete except for spackling, painting, plumbing, lighting fixture installation and glazing.

General Area: Finish grade for blacktop 70% complete; blacktop 35% complete; fence erection in bus loading and unloading lanes 90% complete.

CA-561 713 Building Alterations: AEC contract award issued to Lewis Hopkins Company on June 28.

IR-169 Alterations, Warehouse #13, Stores Yard No. 2: Contract work complete. Physical closing notice issued June 17.

CA-533 Official Telephone Exchange: Contract award on structure issued by AEC.

IR-179 703 Basement Alterations, Fifth Wing, North: Returned unapproved, based on AEC opinion that existing photographic facilities are adequate to serve all present needs.

-- Additional Office Space - Central Stores Warehouse: Project proposal in rough draft form.

Monorail and framing adjacent to former 715 Building site have been removed.

Final Fy '54 shipment of Hauserman material, consisting of 465 lineal feet of partitioning and 12 doors, was received on June 24.

Partition installations during June required use of only four lineal feet from stock, the remaining requirements have been obtained from partitions removed from Legal offices.

Eighteen office moves were made in June.

Lawn rehabilitation and sidewalk replacement adjacent to 761-62 Buildings is in progress by contractor, following installation of new sewer line in this area.

General Maintenance

Sheetmetal strips at bottom and top of compressed gas cylinder storage at Central Stores were removed to provide increased ventilation and escape of hazardous gases.

The south end of Warehouse #12 in Excess Yard was ventilated. Holding rails and chains were provided for storage of empty compressed gas cylinders.

Accoustical ceiling tile was installed in a few rooms of 703 Building, Fifth Wing, to assist in controlling noise.

Several miscellaneous items of work were performed at the new 747 Building, following occupancy by Radiological Sciences.

The time of two carpenters was required in connection with the excess shipping program.

Repainting of corridors, stairwells and offices on second floor of third wing of 703 Building was completed.

New type slip-ring assembly was installed on No. 1 air raid siren. The same type of contact will be installed on two additional sirens.

Fluorescent light fixtures are being installed in north portion of 713-A to replace inadequate incandescent lights.

Connections in all electrical panels at Central Stores were found loose and required tightening.

Several 110-V and 200-V circuits were installed for various tenant equipment.

Expanded metal screens were installed on second floor windows of both the north and south vaults of 703 Building, for pigeon control purposes.

Desert cooler and duct work was installed on Warehouse #13 to cool office space recently provided for housing excess shipping personnel.

The underground steam line, north of 761 Building, recently removed to aid contractor in laying sewer line, has been reinstalled.

Sewer line is installed and plumbing 75% complete for installation of men's restroom in 744 Building.

The replacement of nipples in steam radiators has been completed in 770 and W-10 Buildings.

All six 5HP motors for refrigeration compressor serving surgery at the hospital were overhauled as a result of drenching from broken water line in the fan room.

Windows were washed in 770, W-10, 713, 760 and 705 Buildings by day shift building service employees.

Janitor service was provided as a special service for five days at Chief Joseph Junior High School in connection with Classified Files changeover.

Routine electrical inspections were made on elevator at Meteorlogical Tower.

Offices in 713-A Building were enclosed to ceiling.

Steam Operation

No. 2 boiler was in operation at the beginning of the month, with Nos. 3 and 4 in reserve and No. 1 undergoing annual overhaul.

On June 6, accidental breakage of cooling water line on No. 2 boiler stoker bearing necessitated removal of that unit from service and the placing of No. 4 boiler in operation.

On June 10, No. 2 boiler was again placed in service. No. 4 was taken off the line and its coal hoppers were emptied in preparation for maintenance work on the feeder mechanism of the stokers. Boiler remained in reserve for the balance of the month.

Two leaking tubes were replaced on No. 3 boiler during the middle of the month in order to maintain this boiler in a ready-reserve status.

A tube leak developed on No. 2 boiler while in service, requiring removal of that unit from the line, with No. 3 boiler then being placed in operation to carry the load for the remainder of the month.

At the close of the month Nos. 2 and 4 boilers were in reserve, with No. 1 still undergoing overhaul.

The quantity of steam generated at the 784 plant was 2.2% greater than for the same period of the previous year.

The normal extensive summer maintenance program of 784 Plant and Distribution System is in progress.

On June 24, a boiler inspector from the Travelers Insurance Company inspected No. 1 boiler and the electrically-heated domestic hot water tank at 784 Plant. Also inspected on the saem date were the following items at Central Stores: Boiler, steam heated fuel oil heater, steam heated domestic hot water heater, air compressor receiver and electric hot water heater. (All of the foregoing items are located in the boiler room). In addition the electric hot water heater located in covered storage warehouse was inspected.

Coal consumed: 843.20 net tons (entirely from stockpile).

Steam generated:	12,007.5 M. Lbs.
Steam leaving plant:	10,449.9 M. Lbs.
Steam delivered:	8,361.9 M. Lbs.
Total water softened:	1,663,000 Gallons
Total soft water sent to Kadlec Hospital:	92,580 Gallons
Total soft water sent to 784 Heating Plant:	1,570,420 Gallons

SECURITY AND PATROL UNIT

Document Report

Number of classified documents and prints unaccounted for as of June 1: 354
(124 of the above 354 documents are chargeable to E. I. du Pont de Nemours & Co.)

Number of classified documents and prints reported as unaccounted for during June: 5

Number of classified documents and prints either recovered or downgraded during June: 24
(There were ten documents and ten prints located, and two documents and two prints downgraded)

Number of classified documents and prints remaining unaccounted for as of July 1, 1954: 335
(124 of the above 335 documents are chargeable to E. I. du Pont de Nemours & Co.)

The Non-Technical Document Review Board held two meetings during June and reviewed a total of 77 documents and prints. Of this number -

22 had their classification retained,
36 were downgraded to "Official Use Only",
18 were declassified, and
1 was not within the scope of the Board.

Security Education

Six items which appeared in the Works NEWS were concerned with the subject of security.

There were 339 security meetings held and attended by 4,454 General Electric employees. 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 thirteen meetings, each with an average attendance of 24 employees.

"The Calculated Risk" was shown at two meetings, each with an average attendance of 37 employees.

The security poster with the slogan "Match Face to Badge" was distributed during June:

450 large copies to buildings and offices and the Community,
200 copies of the bus size poster were posted in the busses.

Security reminders bearing the slogan "Did You Lock Your File?" were distributed during the month to file custodians throughout the plant.

Organization and Policy Guide 15.1.3 entitled "Security Clearances and Identification" was distributed to plant personnel during this reporting period.

The "Management News Bulletin" issued to all supervisory personnel, dated June 25, 1954, covered the subject "Self-Inventorying of Security and Confidential Documents.

A copy of a set of instructions issued by the Technical Information Section entitled "Those Pesky Undocumented CONFIDENTIAL Documents!" was distributed to all document custodians during the month.

Two representatives of the Security Unit and one of the employees of the Classified Files met with similar representatives from Knolls Atomic Power Laboratory, the General Engineering Laboratory, and Aircraft Nuclear Propulsion Project at Evendale, Ohio, June 15 and 16, 1954, for discussions of mutual security problems and standardization of security and document control procedures in force at their installations. Future similar joint discussions are being planned.

There were 114 employees of the General Electric Company who received a "Q" security orientation talk from either a representative of the Security Unit or a Security Patrol Supervisor during the month of June.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-W	300
Pat Searches	99	99	50	0	0	0	1
Escorts	12	4	9	44	1	31	59
Ambulance Runs	1	1	5	7	0	3	1
Passes issued:							
One day temporary	105	10	7	13	0	54	71
Travel	0	0	0	0	0	0	62
Red Tag	133	102	46	26	0	590	112
Telephonic	0	0	0	0	0	0	9
Supervisor's Post Contacts	407	245	297	268	494	853	589

Other Security Patrol Activities (Computed by hours):							300 & 700
Security File Check	192	265	156.4*	375.25	465	631	1,518
Building Check	335	33			498	700	792

*In the 100-F Area, the Security File Check and Building Check are combined into one figure.

Arrest Report

Violation	Number of Violations	Cases Cleared	Fined
Speeding	2	2	2
Negligent Driving	1	1	1
No Driver's License in Possession	1	1	1
Total	4	4	4

Citation Tickets issued: 4
Warning Tickets issued: 114

Security Patrol Training Activities:

106 Security Patrolmen received classroom instruction during the month
161 Security Patrolmen received firearms training during the same period.

Training courses were as follows:

Safety Class	1/4 hour
Security Class	3/4 hour
Operations Class	1 hour

Security Patrol Post Changes

On June 1, 1954, the 105-KE "X" level rover post, 100-K Area, was discontinued.

The Main Badge House post, 300 Area, was discontinued at 12:01 A.M. June 12, and moved to the 300-L Badge House.

On June 16, the 105-KE "X" level post was discontinued at 100-K Area.

On June 9, a temporary post known as the Boneyard post was established at 100-K Area.

The Boneyard post, 100-K Area, was discontinued June 17, 1954.

Unaccounted for Document Status as of June 28, 1954

Material	Classifications			Total
	Top Secret	Secret	Confidential	
Documents	0	123	16	139
Drawing Schedules	0	2	0	2
Prints	0	144	36	180
Specifications	0	6	1	7
Tracings	0	2	0	2
Totals	0	277	53	330

Security Administration

Daily Badge Log Entires	2,450
"Q" Clearances	114
Formal "P" Clearances issued	37
"P" approval clearances issued	84
Category access granted	42
Category access withdrawn	43

Rephotographing Project for June, 1954

Number of "A" badges processed	36
Number of "B" badges processed	261
Photos for passes	48
Total	345

HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING JUNE 30, 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							
D. W. McLenegan	Recruit technical and	K. R. Van Tassel	6-1-54	6-25-54	X		
to: Knolls Atomic Power Lab.	scientific personnel	K. R. Van Tassel	6-25-54	7-2-54	X		
Schenectady, New York							
D. W. McLenegan	Engineering and personnel	D. R. Shoults	6-21-54	6-22-54	X		
to: Aircraft Nuclear Propulsion	discussions	D. P. Johnson					
Cincinnati, Ohio							
K. V. Stave	Recruit technical and	L. D. Wright	6-1-54	6-4-54	X		
to: White Sands Proving Ground	scientific personnel						
White Sands, New Mexico							
ENGINEERING DEPARTMENT - ENGINEERING ADMINISTRATION SUB-SECTION							
I. Visits to other Installations							
Marsaelle G. Freidank	Attend joint Security-	G. F. Hamby	6-15-54	6-16-54	X		
to: Aircraft Nuclear Propulsion	Document Control						
Evandale, Ohio	Conference						
C. G. Stevenson	Attend joint Security-	G. F. Hamby	6-15-54	6-16-54	X		
to: Aircraft Nuclear Propulsion	Document Control						
Evandale, Ohio	Conference						
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visitors to this Works							

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
P. D. Bylo General Electric Company Schenectady, New York	Discuss design and fabrication of reactor components	V. D. Nixon J. R. Woolcott	6-22-54	6-25-54	X		100-B 105-B, 105-C 300-L 303
G. M. Clifton General Electric Company Pasco, Washington	Discuss design and fabrication of reactor components	V. D. Nixon J. R. Woolcott	6-22-54	6-25-54	X		100-B 105-B, 105-C 300-L 303
D. Eldred General Electric Company Schenectady, New York	Discuss design and fabrication of reactor components	V. D. Nixon J. R. Woolcott	6-22-54	6-25-54	X		100-B 105-B, 105-C 300L 303
H. E. Grantz General Electric Company Schenectady, New York	Discuss design and fabrication of reactor components	V. D. Nixon J. R. Woolcott	6-22-54	6-25-54	X		100-B 105-B, 105-C 300-L 303
W. A. Hartman General Electric Company Schenectady, New York	Discuss design and fabrication of reactor components	V. D. Nixon J. R. Woolcott	6-22-54	6-25-54	X		100-B 105-B, 105-C 300-L 303
II. Visits to other Installations							
V. D. Nixon to: Knolls Atomic Power Lab. Schenectady, New York	Inspect West Milton, discuss reactor design and development	F. E. Crever	6-28-54	6-30-54	X		
V. D. Nixon to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss reactor pumping, condensers and circulating water systems	J. Ellet	7-7-54	7-9-54	X		
C. A. Pursel to: Argonne National Lab. Chicago, Illinois	Inspect experimental breeder reactor	R. C. Hageman J. M. West P. A. Lottes	6-28-54	6-29-54	X		
J. H. Snyder to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss reactor pumping, condensers and circulating water systems	J. Ellet	7-7-54	7-9-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visits to other Installations							
C. W. Harrison to: Knolls Atomic Power Lab. Schenectady, New York	Interview regarding possibility of transfer	K. R. Van Tassel	6-14-54	6-16-54	X		
ENGINEERING DEPARTMENT - TECHNICAL SECTION							
I. Visitors to this Works							
R. F. Baddour Mass. Institute Tech. Cambridge, Massachusetts	Solvent extraction, PPT methods and fuel fabrication	V. R. Cooper	6-14-54	6-15-54	X		200-W Redox, 221-U 300-L XXX
P. E. Brown Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss inline instrumentation for process control	A. H. Bushey W. N. Carson, Jr. R. E. Tomlinson	6-21-54	6-23-54	X		200-W 222-S, 221-U 300-L XXX 200-E XXX
L. H. Chase Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss inline instrumentation for process control	A. H. Bushey W. N. Carson, Jr. R. E. Tomlinson	6-21-54	6-23-54	X		200-W 222-S, 221-U 300-L XXX 200-E XXX
J. M. Ciborski National Lead Company Fernald, Ohio	Attend Metal Quality Working Committee Meeting	W. T. Kattner	6-15-54	6-17-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
C. E. Bussert National Lead Company Fernald, Ohio	Attend Metal Quality Working Committee Meeting	W. T. Kattner	6-15-54	6-17-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
D. O. Darby Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss inline instrumentation for process control	A. H. Bushey W. N. Carson, Jr. R. E. Tomlinson	6-21-54	6-23-54	X		200-W 222-S, 221-U 300-L XXX 200-E XXX

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
B. W. Dunnington E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metal Quality Control Meeting	E. A. Eschbach W. T. Kattner	6-15-54	6-17-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
T. C. Evans E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metal Quality Control Meeting, discuss canning, irradiation experience	E. A. Eschbach W. T. Kattner E. W. O'Rorke	6-15-54	6-18-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
J. A. Fellows Mallinckrodt Chemical Works St. Louis, Missouri	Attend Metal Quality Control Meeting	E. A. Eschbach W. T. Kattner	6-15-54	6-17-54	X	100-B 105-B, 105-C 300 303
D. J. Fisher Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss inline instrumentation for process control	A. H. Bushey W. N. Carson, Jr. R. E. Tomlinson	6-21-54	6-23-54	X	200-W 222-S, 221-U 300-L XXX 200-E XXX
M. T. Kelley Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss inline instrumentation for process control	A. H. Bushey W. N. Carson, Jr. R. E. Tomlinson	6-21-54	6-23-54	X	200-W 222-S, 221-U 300-L XXX 200-E XXX
W. M. Leaders Mallinckrodt Chemical Works St. Louis, Missouri	Attend Metal Quality Control Meeting	E. A. Eschbach W. T. Kattner	6-15-54	6-17-54	X	100-B 105-B, 105-C 300 303
N. P. Pinto Sylvania Electric Products Pittsburgh, Pennsylvania	Observe canning processes	E. A. Eschbach	6-15-54	6-16-54	X	100-B 105-B, 105-C 300 303; 700
R. C. Reid Mass. Institute Tech. Cambridge, Massachusetts	Solvent extraction, PPT Methods and fuel fabrication	V. R. Cooper	6-14-54	6-15-54	X	200-W Redox, 221-U 300-L XXX
T. C. Runion National Lead Company Fernald, Ohio	Consultation on uranium and thorium	R. B. Richards V. R. Cooper	6-29-54	6-30-54	X	100-D 105 200-E XXX 200-W Redox, 221-U 300-L XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
H. A. Saller Battelle Memorial Institute Columbus, Ohio	Attend Metal Quality Control Committee Meeting	W. T. Kattner	6-15-54	6-17-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 300- 303; 700
L. Squires E. I. du Pont de Nemours & Co. Wilmington, Delaware	Attend metallurgical meeting	O. H. Greager	6-29-54	6-30-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 200-E XXX 200-W XXX 300 303; 700
J. C. Woodhouse E. I. du Pont de Nemours & Co. Savannah River Plant Augusta, Georgia	Attend Metallurgy Advisory Committee Meeting and discuss metallurgy problems	G. E. McCullough	6-27-54	7-1-54	X	100-B 105-B, 105-C 100-D 105 100-F 105 300 303; 700

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II. Visits to other Installations

J. M. Atwood to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Attend AEC Corrosion Symposium	D. E. Thomas	6-15-54	6-16-54	X	
J. M. Atwood to: Knolls Atomic Power Lab. Schenectady, New York	Discuss recirculation loop operation	H. E. Coplan	6-17-54	6-18-54	X	
A. G. Blasewitz to: Ames Laboratory Ames, Iowa	Fuel element development discussion	F. H. Spedding	6-7-54	6-8-54	X	
A. G. Blasewitz to: Battelle Mem. Institute Columbus, Ohio	Fuel element development discussion	H. R. Nelson	6-9-54	6-10-54	X	
A. G. Blasewitz to: Knolls Atomic Power Lab. Schenectady, New York	Fuel element development discussion	D. W. White	6-11-54	6-14-54	X	

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
L. P. Bupp to: North American Aviation Downey, California	Discussion on graphite	W. Eatherly	6-28-54	6-30-54	X		
L. L. Burger to: Argonne National Lab. Lemont, Illinois	Discuss Separations Chemistry	S. Lawroski	6-30-54	6-30-54	X		
L. L. Burger to: Knolls Atomic Power Lab. Schenectady, New York	Discuss Radiation and separation chemistry	J. F. Flagg	6-28-54	6-29-54	X		
A. H. Bushey to: Knolls Atomic Power Lab. Schenectady, New York	Coordinate chemistry research programs	J. F. Flagg	6-1-54	6-4-54	X		
J. C. L. Chatten to: Knolls Atomic Power Lab. Schenectady, New York	Employment interview and consultation on reactor technology, SIR and SAR	F. E. Crever	6-15-54	6-18-54	X		
N. Endow to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Employment interview	J. R. Rosselot	6-2-54	6-3-54	X		
N. Endow to: Knolls Atomic Power Lab. Schenectady, New York	Employment interview	C. E. Weber	6-4-54	6-4-54	X		
S. Goldsmith to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Attend AEC Corrosion Symposium	D. E. Thomas	6-15-54	6-16-54	X		
S. Goldsmith to: Knolls Atomic Power Lab. Schenectady, New York	Discuss recirculation loop operation	H. E. Coplan	6-17-54	6-18-54	X		
N. D. Groves to: Westinhouse Atomic Power Pittsburgh, Pennsylvania	Present paper at AEC Corrosion Symposium	D. E. Thomas	6-15-54	6-16-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class	Restricted Data Unclass.	Areas
C. Groot to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Attend AEC Corrosion Symposium	D. E. Thomas	6-15-54	6-18-54	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		
W. T. Kattner to: Bridgeport Brass Co. Adrian, Michigan	Consultation on uranium metallurgy	S. R. French	4-20-54	10-20-54	X		
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. Cirborski	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		
K. R. Merckx to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on stress problems	L. F. Coffin	6-10-54	6-11-54	X		
S. L. Nelson to: Knolls Atomic Power Lab. Schenectady, New York	Observe SIR and consult on reactor problems	E. P. Lee	6-23-54	6-23-54	X		
W. J. Ozeroff to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Attend Reactor Physics Conference	J. B. Philipson	6-14-54	6-17-54	X		
J. W. Riches to: Battelle Memorial Inst. Columbus, Ohio	Consultation on uranium metallurgy	H. A. Saller	4-23-54	9-23-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
J. W. Riches to: Bridgeport Brass Co. Adrian, Michigan	Consultation on uranium metallurgy	S. R. 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		
J. W. Riches to: National Lead Company Fernald, Ohio	Consultation on uranium metallurgy	J. M. Ciborski	4-23-54	9-23-54	X		
J. W. Riches to: Ames Laboratory Ames, Iowa	Consultation on uranium metallurgy	F. H. Spedding	4-23-54	9-23-54	X		
M. J. Sanderson to: Battelle Mem. Institute Columbus, Ohio	Consultation on reactor fuel materials	H. W. Russell	6-11-54	6-11-54	X		
R. J. Sloat to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Process consultation	M. H. Wahl	6-21-54	6-23-54	X		
R. J. Sloat to: National Lead Company Fernald, Ohio	Process consultation	T. C. Runion J. Breitenstein	7-1-54	7-2-54	X		
A. E. Smith to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Neutron counting meeting and process and inspection	I. B. Venable E. J. Walko	6-16-54	6-18-54	X		
A. E. Smith to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Neutron counting meeting and process and inspection	I. B. Venable E. J. Walko	6-21-54	6-25-54	X		

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OFFICIAL USE ONLY

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. F. Snoeberger to: National Lead Company Fernald, Ohio	Attend Thorium Metal Quality Working Committee Meeting	T. C. Runion	6-3-54	6-4-54	X		
M. J. Szulinski to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Process discussion for continuous denitration	C. D. Harrington	6-7-54	6-7-54	X		
M. J. Szulinski National Lead Company Fernald, Ohio	Process discussion for continuous denitration	C. Runyon	6-8-54	6-9-54	X		
M. J. Szulinski to: Catalytic Construction Philadelphia, Pennsylvania	Process discussion for continuous denitration	W. E. Kelley R. E. Bener H. Bulkowski	6-10-54	6-11-54	X		
M. J. Szulinski to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Process discussion for continuous denitration	W. M. Leaders C. D. Harrington	6-21-54	6-21-54	X		
M. J. Szulinski to: National Lead Company Fernald, Ohio	Process discussion for continuous denitration	T. C. Runion	6-22-54	6-23-54	X		
M. J. Szulinski to: Oak Ridge National Lab. Oak Ridge, Tennessee	Process discussion for continuous denitration	W. K. Eister	6-23-54	6-25-54	X		
M. J. Szulinski to: Catalytic Construction Philadelphia, Pennsylvania	Process discussion for continuous denitration	W. E. Kelley R. E. Vener	6-28-54	6-28-54	X		
M. J. Szulinski to: Standard Oil Development Linden, Bayway, New Jersey	Process discussion for continuous denitration	F. W. Schumacher R. M. Shepardson	6-29-54	6-29-54	X		
C. D. Wilson to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Attend AEC Corrosion Symposium	D. E. Thomas	6-15-54	6-16-54	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
C. D. Wilson to: Aluminum Company of America New Kensington, Pennsylvania	Discuss corrosion problems	R. H. Brown R. D. Williams	6-17-54	6-17-54			
E. C. Wood to: U. S. Atomic Energy Comm. Washington, D. C.	Obtain briefing for visit to A.E.R.E.	B. R. Byrne	6-29-54	7-16-54	X		
E. C. Wood to: Harwell, England	Hold technical discussions at Atomic Energy Research establishment	P. McDaniel	7-12-54	7-16-54	X		
I. Visitors to this Works(cont'd)							
W. Davis U. S. Atomic Energy Comm. Savannah River Plant Augusta, Georgia	Attend metallurgy meeting	G. E. McCullough	6-29-54	6-30-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
F. Dowling U. S. Atomic Energy Comm. Oak Ridge, Tennessee	Attend metallurgy meeting	G. E. McCullough	6-29-54	6-30-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
M. R. Fenske Pennsylvania State College State College, Pennsylvania	Consultation on reactor processes	R. B. Richards	6-15-54	6-18-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
C. D. Harrington Mallinckrodt Chem. Wks. St. Louis, Missouri	Attend metallurgy meeting	G. E. McCullough	6-29-54	6-30-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700
A. J. Vander Weyden U. S. Atomic Energy Comm. Washington, D. C.	Attend metallurgy meeting	G. E. McCullough	6-29-54	6-30-54	X		100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700

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OFFICIAL USE ONLY

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass. Areas
C. L. Wheelock North American Aviation Co. Downey, California	Consultation on reactor safety element	J. A. Berberet R. L. Dickeman A. B. Carson	6-28-54	6-29-54	X	100-H 105 300-L
G. Wunder National Lead Company Fernald, Ohio	Attend metallurgy meeting	G. E. McCullough	6-29-54	6-30-54	X	100-B 105-B, 105-C 100-D 105, 189 100-H 105 300 303; 700

FINANCIAL DEPARTMENT

I. Visits to other Installations

K. G. Grimm to: Knolls Atomic Power Lab. Schenectady, New York	Review of financial information	W. W. Smith R. Turner	6-28-54	6-30-54	X	
J. W. Harris to: Oak Ridge National Lab. Oak Ridge, Tennessee	Confer on Property Management policies and procedures	F. P. Trent	6-22-54	6-25-54	X	
J. W. Harris to: Argonne National Lab. Lemont, Illinois	Confer on Property Management policies and procedures	J. H. McKinley	6-28-54	6-29-54	X	
C. J. Shortess to: Oak Ridge National Lab. Oak Ridge, Tennessee	Exchange SF Account-ability information	W. H. Lewis	6-28-54	6-28-54	X	
C. J. Shortess to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Exchange SF Account-ability information	L. R. Drake I. B. Venable	6-25-54	6-25-54	X	

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RADIOLOGICAL SCIENCES DEPARTMENT

I. Visitors to this Works

G. J. Briscoe Oak Ridge National Lab. Oak Ridge, Tennessee	AEC Fellowship Program	H. M. Parker	6-22-54	three months	X	100-B 105-B, 105-C 100-D 105, 100-F 105 100-H 105; 200-W 221-T, 231, Redox, 221-U; 200-E XXX; 300

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
W. D. Claus U. S. Atomic Energy Comm. Washington, D. C.	Program discussion on radiation	D. W. Pearce	6-21-54	6-21-54	X		
M. S. Friedman Argonne National Lab. Lemont, Illinois	River sampling	D. W. Pearce H. J. Paas Z. E. Carey	6-15-54	6-15-54	X		300 XXX
G. W. Hatfield Atomic Energy of Canada Chalk River, Ontario	Biophysics discussions	D. W. Pearce M. L. Mickelson	6-15-54	6-15-54		X	300 XXX
M. Knapp University of California Berkeley, California	Employment interview	J. DePangher F. Clagett	6-29-54	6-30-54		X	300 XXX
W. F. Neuman University of Rochester Rochester, New York	Confer on special materials and handling methods	M. L. Mickelson F. E. Adley H. A. Kornberg	6-21-54	6-23-54	X		100-B XXX 200-W Redox 100-F 108 300 XXX
R. C. Palange U. S. Public Health Service Washington, D. C.	Review Columbia River Water Studies	D. W. Pearce H. J. Paas	6-16-54	6-17-54	X		300 XXX
D. Peppard Argonne National Lab. Lemont, Illinois	River sampling	D. W. Pearce H. J. Paas Z. E. Carey	6-15-54	6-15-54	X		300 XXX
W. Singlevich U. S. Army Air Force Washington, D. C.	River sampling	H. J. Paas	6-15-54	6-15-54	X		300 XXX
M. L. Smith Oak Ridge National Lab. Oak Ridge, Tennessee	AEC Fellowship Program	H. M. Parker	6-22-54	three months	X		100-B 105-B, 105-C 100-D 105; 100-F 105 100-H 105; 200-W 221-T, 231, Redox, 221-U; 200-E XXX; 300 303; 700

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OFFICIAL USE ONLY

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
C. Spiegl University of Rochester Rochester, New York	Confer on special materials and handling methods	M. L. Mickelson F. E. Adley H. A. Kornberg	6-21-53	6-23-54	X	100-B XXX 100-F 108 Redox 200-W 300 XXX
M. H. Studier Argonne National Lab. Lemont, Illinois	River sampling	D. W. Pearce H. J. Paas Z. E. Carey	6-15-54	6-15-54	X	300 XXX
J. W. Taylor Oak Ridge National Lab. Oak Ridge, Tennessee	AEC Fellowship Program	H. M. Parker	6-22-54	three months	X	100-B 105-B, 105-C 100-D 105; 100-F 105 100-H 105; 200-W 221-T, 231, Redox, 221-U; 200-E XXX; 300 303; 700
R. H. Wilson University of Rochester Rochester, New York	Confer on special materials and handling methods	M. L. Mickelson F. E. Adley H. A. Kornberg	6-21-54	6-23-54	X	100-B XXX 100-F 108 200-W Redox 300 XXX

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II. Visits to the other Installations

E. E. Donaldson to: University of California Berkeley, California	Discuss alpha, beta, gamma and neutron radiation dosimetry	M. Knapp	6-1-54	6-3-54	X	
D. E. Warner Atomic Energy Project West Los Angeles, California	Discuss large animal research and special instrumentation	B. M. Brundage	6-1-54	6-2-54	X	
D. E. Warner to: University of California Berkeley, California	Discuss large animal research and special instrumentation	J. G. Hamilton	6-3-54	6-4-54	X	

MANUFACTURING DEPARTMENT

I. Visitors to this Works

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
R. C. Mann Aircraft Nuclear Propulsion Lockland, Ohio	Interview personnel and attend instrumentation conference	J. E. Kaveckis	6-7-54	6-12-54	X	200-E XXX 200-W 221-U, Redox 300 XXX; 700
II. Visits to other Installations						
J. E. Maider to: General Electric Company Schenectady, New York	Review GE Management training problems	R. L. Fegley	6-8-54	6-8-54	X	
J. E. Maider to: U. S. Atomic Energy Comm. Washington, D. C.	Combined Operations Meeting and also second meeting of same	F. K. Pittman F. K. Pittman	6-10-54 6-17-54	6-11-54 6-18-54	X X	
J. E. Maider to: Rocky Flats Laboratory Denver, Colorado	Discuss production allocation shipments	F. H. Langell	6-14-54	6-15-54	X	
J. H. Warren to: Knolls Atomic Power Lab. Schenectady, New York	Review SIR Reactor Control and Instrumentation systems	E. P. Lee	6-29-54	6-30-54	X	
J. H. Warren to: E. I. du Pont de Nemours Savannah River Plant Augusta, Georgia	Discuss reactor operation and safety matters	W. S. Church	6-28-54	6-28-54	X	
PLANT AUXILIARY OPERATIONS DEPARTMENT - PLANT PROTECTION SECTION						
I. Visits to other Installations						
C. C. Haelsig to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Attend joint security-document control meeting	G. F. Hamby	6-15-54	6-16-54	X	
R. E. Jaynes to: Aircraft Nuclear Propulsion Cincinnati, Ohio	Attend joint security-document control meeting	G. F.Hamby	6-15-54	6-16-54	X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
PLANT AUXILIARY OPERATIONS DEPARTMENT - OPERATIONS ANALYSIS							
I. Visits to other Installations							
D. O. Richards to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Discuss statistical application to metal quality	W. M. Leaders	6-7-54	6-8-54	X		
D. O. Richards to: U. S. Atomic Energy Comm. St. Louis, Missouri	Discuss statistical application to metal quality	Mr. Osterwald	6-9-54	6-11-54	X		
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT (cont'd)							
I. Visitors to this Works							
G. W. Giddings Research Laboratory Schenectady, New York	Unclassified discussions with Rad. Sc. and Tech. personnel	R. E. Curtis	6-29-54	6-29-54		X	300 303
W. G. Urbon Knolls Atomic Power Lab. Schenectady, New York	Salary Project Meeting	W. I. Patnode	6-21-54	6-23-54		X	700

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PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY JUNE 1954

STATISTICAL AND GENERAL

The design of aluminum dummies is being changed again and discussions are being held concerning metal specifications. Additional orders will be placed when firm designs and specifications are available.

The delivery schedule of extrusion towers from the Pacific Coast Engineering Co. fell behind the vendor's original promise. By assigning an expediter to the vendor's plant the schedule was improved enough to meet the shutdown date for installation of this equipment.

On shipments of the above mentioned fabricated towers from Alameda, Calif., we were successful in getting the rail carrier to expedite dilivery to meet plant site requirements without paying premium freight charges of $1700 which had been authorized.

Arrangements were made through the New York office of the Apparatus Dept. for personnel from the Design Section to meet with executives of the Lumus Corp. and the M. W. Kellog Co. to discuss design and fabrication of a Nitric Acid Vacuum Fractionator for Purex. The meeting was held to determine the interest of these companies in this work and their ability to perform.

A further reduction in back orders was realized during June. As of June 25 back orders on hand were 412 compared with 662 as of May 28. Of the 412 back orders, 100 were for stainless steel. The 412 back orders cover 220 line items which represent 1.2% of the 18,300 line items in General Supplies inventory.

During the month 8721 receiving reports were written, which represents the highest number of reports ever writtenin one month. In spite of this exceptional load a large percentage of the material is processed on the same day it is delivered and the paper work is being kept current.

Warehousing and record keeping responsibilities for 1214 tons of pile graphite and 86 tons of non-contaminated scrap graphite were transferred from the Engineering Dept. to the Spare Parts Units.

The Commission suspended receipts of incoming scrap, salvage, and excess material from construction contractors in line with its policy to have these contractors dispose of their own inventories.

The Major portion of General Supply materials have been ordered for the start-up of the "K" East and "K" West areas.

During June material and equipment valued at $57,990 were withdrawn from the Excess Accounts for use on the Project.

Organization and Personnel	5-31-54	6-30-54	Change
Employees on Roll	282	293	+11

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
JUNE 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.

June 1954

Cost Category	Government Agency	Small Business	Big Business	Educational and Other
$0 - $ 24.99	$ 13.50	$ 5,309.58	$ 2,456.04	$ 146.70
$25 - $ 499.99	790.45	121,225.98	65,202.42	429.00
$500 - $ 24,999.00		323,483.40	401,183.33	
$25,000 - $ Up		96,844.00	439,166.00	
	$ 803.95	$ 546,862.96	$ 908,007.79	$ 575.70
Number of Actions	8	1604	860	21

Vendors Contacts	252
Claims Processed	2
Damage Reports Processed	11
Over & Short Reports Processed	1
Accounts Payable Request Handled	299
Difference Slips Processed	95
Clearance Slips & Purchase Order Change Approvals	411
Material Exception Reports	394
Return Orders Issued	175

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.

States	Manufactured	Shelf	Total
Washington	$ 763,447.57	$ 228,346.64	$ 991,794.21
Oregon	175,013.97	85,850.83	260,864.80
Idaho		775.50	775.50
Other	98,658.03	104,157.86	202,815.89
	$1,037,119.57	$ 419,130.83	$1,456,250.40

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

Items Processed	Items Received	* Value of Items Rec'd.	** Cost of Items Rec'd.	Savings to H.A.P.O.
253	432	$12,480.17	$5,065.59	$7,414.58

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

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT

Requisitions on hand 6-1-54	G	D	Total
Operations Procurement	798	0	798
Construction Procurement	0	244	244
A.E.C. Procurement	237	109	346
Total	1035	353	1388
Requisitions Assigned during June			
Operations Procurement	2042	0	2042
Construction Procurement	0	599	599
A.E.C. Procurement	448	107	555
Total	2490	706	3196
Requisitions Placed during June			
Operations Procurement	2022	0	2022
Construction Procurement	0	587	587
A.E.C. Procurement	466	140	606
Total	2488	727	3125
Requisitions on hand 6-30-54			
Operations Procurement	818	0	818
Construction Procurement	0	256	256
A.E.C. Procurement	219	76	295
Total	1037	332	1369

Purchase Orders Placed	HW	HWC	Total
Operations Procurement	1695		1695
Essential Material	29		29
Construction Procurement		583	583
Local Purchase	14		14
Total	1738	583	2321

Value of Orders Placed			
Operations Procurement	$ 481,589.94	$	$ 481,589.94
Essential Material	557,560.37		557,560.37
Construction Procurement		311,159.88	311,159.88
Local Purchase	78.24		78.24
Total	$1,039,228.55	$ 311,159.88	$1,350,388.43

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	71	33	9	113
Essential Material	7	1	1	9
HWC Construction	38	17	10	65
Total	116	51	20	187

Value of Alterations Issued	Increase	Decrease	Total
HW Operations	$ 3,520.91	$ 4,887.66	$ 8,408.57
Essential Material	57,357.15	6,597.92	63,955.07
HWC Construction	60,953.40	4,388.35	65,341.75
Total	$ 121,831.46	$ 15,873.93	$ 137,705.39

Government Transfers	OR	ORC
	2	0

Organization and Personnel	5-31-54	6-30-54	Change
Employees on Roll	20	23	+ 3

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
JUNE, 1954

Arrangements were made through the New York office of the Apparatus Dept. for personnel from the Design Section to meet with executives of the Lumus Corp. and the M. W. Kellog Co. to discuss design and fabrication of a Nitric Acid Vacuum Fractionator for Purex. The meeting was held to determine the interest of these companies in this work and their ability to perform. Upon receipt of the requisition for this Fractionator negotiations will be made by Letter order with the chosen vendor. All negotiations to date have been approved by A.E.C. whose representatives have attended the Richland meetings.

We have received a directive from the A.E.C. on CG-558 Water Plant Improvement Program. We are working very closely with the Engineering Department and are obtaining copies of their work schedules showing design time, requirement time and construction time for the total job, as well as the areas. It is our intention to set-up controls that will obtain the material for this project as required by the work schedule.

In order to expedite delivery of copies of the purchase order to Receiving and Inspection, copies of purchase orders will be picked up by Stores messengers from the procurement units.

Purchase Order HWC-3231 covers extrusion towers ordered from the Pacific Coast Engineering Co.of Alameda,Calif. Since the delivery schedule on the towers fell behind the vendor's original promise, it was necessary to put an Expediter in the vendor's plant to obtain the towers for a scheduled plant shutdown. The Expediter was able to assist the vendor in improving his schedule to meet the scheduled shutdown date.

The following figures depict the work load trend of this Unit:

	1954						
	Feb.	Mar.	Apr.	May	4 Month Average	June	% Change
Requisitions assigned	365	475	550	549	484	599	24
Requisitions placed	318	486	488	556	462	586	27
Requisitions on hand	200	189	251	244	221	256	16

Orgainzation and Personnel	5-31-54	6-30-54	Change
Employees on Roll	22	24	+ 2

Mr. C. C. Hill and Mr. W. B. Johnson were added to this unit to assist in procuring material for the CG-558 Project.

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
JUNE -- 1954

Statistical and General

The present supply of Aluminum caps and cans is adequate and present orders are being altered to provide for the indexing marks required by Metal Preparations. The design of Aluminum dummies is again being changed, and discussions are being held concerning the metal specifications. Additional orders will be placed as soon as firm designs and specifications are available.

Information received from Manufacturing indicate that our requirements for Nitric Acid will be substantially increased over present levels, and discussions are being scheduled to clarify the situation and lay the necessary groundwork to assure an adequate supply of Nitric Acid at all times.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate - approved by the vendor and the Company; submitted to the Commission for approval.

2. Dry Aluminum Sulphate - completed and in force.

3. Tributyl Phosphate - completed and in force.

4. Nitric Acid -- partial -- This is the DuPont contract and has been completed and is in force.

5. Steam Coal - Bids have been received on both the one-year and the three-year basis and are being studied.

Organization and Personnel	5-31-54	6-30-54	Change
Employees on Roll	34	34	-0-

PURCHASING AND STORES SECTION
STORES UNIT
JUNE 1954

STATISTICAL AND GENERAL

A further reduction in back orders was realized during June. As of June 25 back orders on hand were 412 compared with 662 as of May 28. Of the 412 back orders, 100 were for stainless steel. The 412 back orders cover 220 line items which represent 1.2% of the 18,300 line items in General Supplies inventory.

During the month 8721 receiving reports were written, which represents the highest number of reports ever written in one month. In spite of this exceptional load a large precentage of the material is processed on the same day it is delivered and the paper work is being kept current.

The physical inventory of Excess Materials was completed on schedule. Although the dollar adjustment figure is not known, it appears that it will be favorable.

Warehousing and record keeping responsibilities for 1214 tons of pile graphite and 86 tons of non-contaminated scrap graphite were transferred from the Engineering Dept. to the Spare Parts Units.

The first spare parts procured by a construction contractor as operational spares were received by the Spare Parts Unit during the month. These consisted of about 145 items from Kaiser Engineers for K Project.

The Commission suspended receipts of incoming scrap, salvage, and excess material from construction contractors in line with its policy to have these contractors dispose of their own inventories.

Our safety shoe program has been reviewed by the Safety Unit together with Stores and orders have been placed for our fall line of safety shoes. We have on hand and on order approximately 1,500 pairs of safety shoes which is considered adequate for good coverage. Safety shoes were established in the 100-H Area Store.

The major portion of General Supply materials have been ordered for the start-up of the "K" East and "K" West areas.

We have completed our new stationery catalogue which will be issued for plant use in July. At this time the bin stock is being arranged in the same sequence as the material is listed in the catalogue. This arrangement will speed up filling of the store orders.

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

Disbursements by store order	$ 52,425
Transfers to inventories and Plant Accounts	5,565
Offsite shipments	228,718
Receipts	537,162

Organization and Personnel	5-31-54	6-30-54	Change
Employees on Roll	193	199	6

PURCHASING & STORES SECTION

TRAFFIC UNIT

June, 1954

STATISTICAL AND GENERAL

On a recent purchase of fabricated towers from Alameda, California, we were successful in getting expedited delivery on all towers to meet plant site requirements without paying premium transportation charges of $1,700.00 which has been authorized by the field.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of June amounting to $300.91. This makes a total savings from September 1, 1946 to date of $1,767,459.16.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for June, 1954	Savings from 9-1-46 thru May, 1954	Savings from 9-1-46 to date
Liquid Aluminum Sulphate	Portland, Ore.	$300.91		
		$300.91	$1,767,158.25	$1,767,459.16
2. Freight Bill Audit		$1,723.91	122,763.38	124,487.29
3. Loss and Damage & Overcharge Claims		620.96	137,738.50	138,359.46
4. Ticket Refund Claims		946.98	39,159.97	40,106.95
5. Household Goods Claims			17,641.85	17,641.85
		$3,592.76	$2,084,461.95	$2,088,054.71

Work Volume Report

Completed Travel Requests		205
Reservations resulting from above:	Rail	103
	Air	266
	Hotel	230
Expense Accounts Checked		276
Household Goods & Automobiles	Movements Arranged Inbound	2
	Movements Arranged Outbound	7
	Insurance Riders Issued	2
Ticket Refund Claims	Filed	17
	Collected - Number	25
	Collected - Amount	$946.98

PURCHASING & STORES SECTION
TRAFFIC UNIT
JUNE, 1954

Work Volume Report (cont.)

Ticket Refund Claims	Filed	6
	Collected - Number	6
	Collected - Amount	$620.96
	Over and Shorts Processed	37
	Damage Reports Processed	8
Freight Bill Audit Savings		$1,723.91
Freight Shipments Traced		33
Quotations	Freight Rates	233
	Routes	229
Bills Approved	Air Freight	3
	Air Express	33
	Boat	3
	Carloading	151
	Express	150
	Rail	1,046
	Truck	297
Carload Shipments	Inbound	1,025
	Outbound	19

Report of Carloads Received

Commodity	CMSTP&P	NP	UP	Total
Aluminum Sulfate	2	3	4	9
Anhydrous Hydroflouric Acid			1	1
Asphalt		3		3
Caustic Soda	20	43		63
Chlorine	4	1	1	6
Coal	119		750	869
Firebrick			1	1
Furnaces			2	2
Limerock	1		1	2
Methanol		1		1
Methyl Isobutyl Ketone			1	1
Nitric Acid		12	13	25
Partitions			1	1
Phosphoric Acid	1		1	2
Potash			1	1
Salt		2		2
Silicate of Soda	3	4	3	10

PURCHASING & STORES SECTION
TRAFFIC UNIT
JUNE, 1954

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	Total
Soda ash	1	2	3	6
Steel			1	1
Steel Drums			1	1
Steel Pipe		1		1
Sulphuric Acid		4		4
Sulfate of Alumina		3		3
Tanks			1	1
Transformer Oil			1	1
Merchandise & Stop Cars	1	1	6	8
	152	80	793	1,025

Organization & Personnel	5-31-54	6-30-54	Change
	9	9	0

TRANSPORTATION SECTION
MONTHLY REPORT
June 1954

Transportation Section personnel forces increased from 485 to 491 by thirteen new hires, one transfer in, three terminations, and five transfers out.

Recasted budgeted personnel requirements for FY 1955 and FY 1956 to conform to the revised organizational units with no change in section totals.

Key personnel of the Transportation Section Civil Defense organization participated in the test of June 14.

Completed financial arrangements with respect to the expenditure of funds for the emergency flood control assistance at Bonners Ferry, Idaho from May 21 through May 25, 1954. The following is a summary of the charges which were billed to the Atomic Energy Commission:

Labor services	$12,075.20
Equipment rental (HO units)	2,994.10
Equipment maintenance service (non HO)	230.46
Living expenses	692.58
	$15,992.34

Conducted a tour of the shop and related facilities in the 1131 Area on June 25 for the benefit of G.E. auditors headed by Mr. Welcome Retz of the traveling staff from Schenectady, N. Y. Functional operations were generally discussed and a check of records relating to equipment maintenance and repair parts is in progress.

Completed the receipt of 132 new 1954 model Chevrolet sedans on June 7. Eight of these units will be for Minor Construction, 14 for Major Construction, and the remaining 110 for Operations of which 50 have already been placed in service on a replacement basis.

Completed the fiscal year end physical inventory of Plant owned HO equipment during the last half of June. The physical inventory disclosed that all units were properly accounted for and also served as an assignment and cost code check.

Safety rules for each equipment maintenance facility were brought up to date and approved. Copies have been furnished to supervisory personnel and display holders are being fabricated to comply with Plant safety regulations.

The decontamination center in 200-West Area operated intermittently throughout the month and 39 units of HO equipment were released by the Radiation Monitoring Unit during the reporting period. Work is being performed by Transportation Section personnel under special work permit conditions on special work orders from the Manufacturing Department.

Effective June 1 daily inspections of the locomotive stored overnight in the 700 Area and the incoming and outgoing commercial cars at the two classification yards were discontinued. This action permitted the transfer of a Diesel Electric Locomotive Mechanic Journeyman from the Heavy Equipment Garage in the 1100 Area to the Riverland Roundhouse.

Completed a review of repair parts in the area garages and Riverland which reduced inventories by $644.60. Overstocked and obsolescent materials are

being returned to the Stores Unit or excessed. Pontiac spare parts will be transferred to Construction with the Pontiac sedans.

Construction of the Consolidated Transportation Facility progressed from 66% on May 21 to 76% on June 25 compared to the scheduled 90%. It appears extremely doubtful that the scheduled completion date of 8-2-54 can be realized.

Two tank truck units sustained estimated damages of $9,076.25 while engaged in fighting a grass fire on June 20. A 4,000 gallon unit turned over when the driver failed to negotiate a turn. The tractor (68D-4999) incurred extensive damages and the trailer (64-4196) was a total loss. The second unit (68D-4798) became stuck in a sandy gully and was caught by the fire before it could be removed. Prompt investigation, followed by a comprehensive report, has been duly completed. Two 1,500 gallon tanks have been mounted on a tractor-trailer unit (68E-2959 and 64-2722) at a cost of $380.27 to provide the Fire Protection Unit with temporary equipment until the damaged units can be repaired or replaced.

Developed revised unit rates for the Road Materials Inventory (0420-930) to become effective on June 28, 1954. Rate increases averaging nearly 15% were required because of higher labor and equipment rental. This represents the first change in rates since May 1952 and is necessary to re-establish and maintain a more appropriate relationship between the physical inventory value and the general ledger balance.

Preliminary plans for the forthcoming physical inventory of Railroad Materials (0410-85) were developed on June 23 by representatives of the Property Accounting Section and the Transportation Section. The formal physical inventory is scheduled for July 26 and 28.

Developed revised rental rates for all types of HO equipment for the new fiscal year to become effective on June 28, 1954.

Railroad carloads of commercial materials during June decreased by 203 cars or 7.96% under May due to lower receipts of construction materials for the 100-K Area and certain essential materials. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	944	34	38	959
A.E.C.	50	0	0	45
A.E.C. Kaiser (cement)	29	0	0	32
Blaw Knox	35	0	0	34
Bumstead Wolford	2	0	0	2
Gaasland Construction Co.	0	0	0	1
L. A. Hopkins Co.	5	0	0	5
Kaiser Engineers	25	0	0	43
Sound Construction Co.	1	0	0	1
U. S. Army	32	0	0	31
	1,123	34	38	1,153

Railroad process service during June required 345 overtime hours and was 72 cars or 40% under May due to a maintenance shutdown of the Redox Facility and increased capacity per car. A heavy loading program inaugurated a few months ago was fully attained in June and with the newly modified cars (three well) increases the capacity per car by 125%. Over-all work load was not significantly reduced because of special movements between the 100 Areas and special services connected with the shutdown. The graveyard shift for process service was temporarily abandoned with the train crew being assigned to the day shift to assist in these special movements.

The Plant Bus System transported 3.29% fewer passengers in June than in May. The following statistics indicate the magnitude of service rendered:

Passenger volume	140,064
Revenue - bus fares	$ 7,003.23
Earnings - transit advertising (May)	$ 103.40
Bus trips	6,786
Bus miles - passenger carrying	191,442
Passenger miles	4,436,746

Effective June 12 all bus service to the 300 Area was routed via the 300-L Badge House as the old badge house is being deactivated.

The Richland Bus System transported 28% fewer passengers in June than in May. The substantial decrease in passenger volume is due to the completion of the public school term and compares with a decrease of 24% in June 1953. The following statistics indicate the volume of service rendered:

Total passengers including transfers	8,786
Revenue - bus fares	$ 613.13
Earnings - transit advertising (May)	$ 4.61
Bus trips	1,194
Bus miles - passenger carrying	6,328
Passenger miles	23,641

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 141 which were rendered to the following locations as indicated:

Benton City, Washington	13
Grandview, Washington	2
Hinkle, Oregon	10
Kennewick, Washington	19
Pasco, Washington	41
Pendleton, Oregon	9
Prosser, Washington	3
Spokane, Washington	1
Sunnyside, Washington	15
Walla Walla, Washington	7
West Richland, Washington	8
Yakima, Washington	13

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

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	47,945	20,295	10,500	612	137
Received during month	108,926	25,000	30,500	2,456	318
Dispensed during month	123,146	23,160	31,800	776	64
Stock at end of month	33,725	22,135	9,200	2,292	391

[redacted]

Transportation Section

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

Motor Overhauls	62
Class A Inspections and repairs	112
Class B Inspections and Lubrications	1,215
Semi-monthly Inspections - Buses	162
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	49
Other routine maintenance repairs and service calls	1,968
Accident Repairs and Paint Jobs	43
Tire Repairs	477
Wash Jobs	540
	4,628

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

Code	Type	No. of Units	Total Mileage
1A	Sedans	336	554,723
1B	Buses	98	203,008
1C	Pickup Trucks	460	257,670
1D	Panel,Carryall,Sta.Wagon	154	134,883
1E	Armored Car	1	127
1G	Jeeps	2	380
68 Series	Trucks	208	79,166
		1,259	1,229,957

Completed a non-skid single seal coat application on eight miles of Richland streets (based on 20' roadway) requiring approximately 1,400 cubic yards of mineral aggregate, 30,000 gallons of asphaltic material and 1,256 man-hours.

Maintenance of primary roads required 307 man-hours; secondary roads 16 man-hours; and walkways, parking facilities, and related ground maintenance in the Manufacturing Areas 48 man-hours.

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

	MC 3	MC 5
Stock at start of month	48.98	69.97
Received during month	38.27	116.25
Used during month	12.87	106.76
Stock at end of month	74.38	79.46

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

	3/4" to 0 Pre-mix Tons	¼" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	154	213.5	4,232	3,836	2,236
Made during month	0	0	1,320	0	0
Used during month	80	25	1,978	0	10
Stock at end of month	74	188.5	3,574	3,836	2,226

July 7, 1954

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

June, 1954

GENERAL

The Section total work force was one hundred and sixty-seven (167) as of June 30, 1954, a decrease of one from last month.

Plant electrical peak demand for June is reduced because the North Richland load was transferred to a separate contract:

Date	Demand KW	May Comparative KW Demand
6-1-54 (2:30 PM-3:00 PM)	115,300	119,616

Contract for construction of the HW official telephone exchange building (Project CA-533) was awarded to the Lewis Hopkins Company of Pasco on June 22. The award stipulates that the building be completed within 180 calendar days.

Final information was furnished to the publisher of the Richland telephone directory for the July, 1954 edition which is scheduled for delivery on July 10.

The Section completed the FY 1954 with total operating costs approximately 3% under the budgeted $3,788,000. The underrun was divided evenly between controlable salary expense and the non-controlable purchased electricity costs.

The following performance is reported on the bogeys which were established for FY 1954.

	FY 1954 Bogey	Reported FY 1954
Telephones		
Monthly cost per subscriber station	$4.30	$3.93
Net return on investment (Village only)	7.0%	11.9%
Electricity		
Average KW/month cost (Plant only)	$1.92	$1.97

GENERAL (Continued)

The substantial betterment of the Telephone goals was obtained through a combination of favorable occurences such as customers' willing acceptance of four party service which added 600 accounts, the telephone rate increase of May 1, and operational methods which deferred the planned hiring of six additional personnel. The electricity bogey figure was predicated on the assumption that the 10,000 KW of "K" test power would be obtained on the plant operational contract thus effecting a lower unit cost by spreading fixed charges. However, the separate "K" test power contract which was negotiated does not influence the plant contract.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

Line splices in the 115 KV transmission line section through Richland were changed over to high compression type sleeves eliminating the automatic type sleeves, one of which failed last month and caused a thirty-five minute outage.

Doble tests located a cracked bushing in the 230 KV tie breaker, A-324, in the 151-B-C substation on June 21. The bushing was replaced and the breaker returned to service on June 24.

Numerous power surges due to lightning on the BPA electrical system occurred during the month. No loss in plant production resulted from these faults.

System Expansion and Planning

Initial energization of the 230 KV tie line and the K West substation is scheduled for July 16.

The two new underground cables to the 313 Building were run in the vault, high potted and tested for energization on July 1.

TELEPHONE UNIT

Maintenance and Operation

Equipment was installed in the Richland exchange to give an alarm signal when a called party, in some of the busiest hundred groups, fails to release the connector for a predetermined period (4 to 6 minutes) after the calling party has hung up. This feature provides a better method of restoring accidentally held switching equipment to normal service.

As a result of fire damage to the communication system in the McVickers Building on June 5, 1954, it was necessary to provide temporary wiring in order to re-establish service. Permanent wiring in this building is awaiting completion of building renovation work.

Grounds were installed at each end of the new Richland-North Richland tie cable and connected the cable sheath to these grounds in order to eliminate induction noise on cable circuits.

TELEPHONE UNIT (Continued)

System Expansion and Planning

Installed a private branch exchange switchboard in the 141-M Building, 100-F area, for use by the Biology Section, Radiological Sciences. This switchboard has three trunk lines and seven stations connected.

Drawings were prepared to show layout of the 100-K area telephone distribution cable and the 100-K telephone cable vault splicing arrangement. These layouts were made as a guide in coordinating the activities of various AEC contractors doing telephone cable work.

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	6102	999	17	347	4062
N.Richland	570	267	76	38	466
Process Areas	23	1848	332	--	1720
Total	6695	3114	425	385	6248

Richland-North Richland four-party service:

	June 20, 1954	May 20, 1954
Number of subscribers	1497	1485
Number of vacant sides	207	211

Fifty-nine (59) new requests for telephone service in Richland were received, making the backlog two hundred and fifty (250).

Service orders during the month were as follows:

Residential and commercial	332
Official (permanent)	225
Official (temporary)	61
Total	618

RB Britton by MAW

ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

RB Britton:MAW:ag

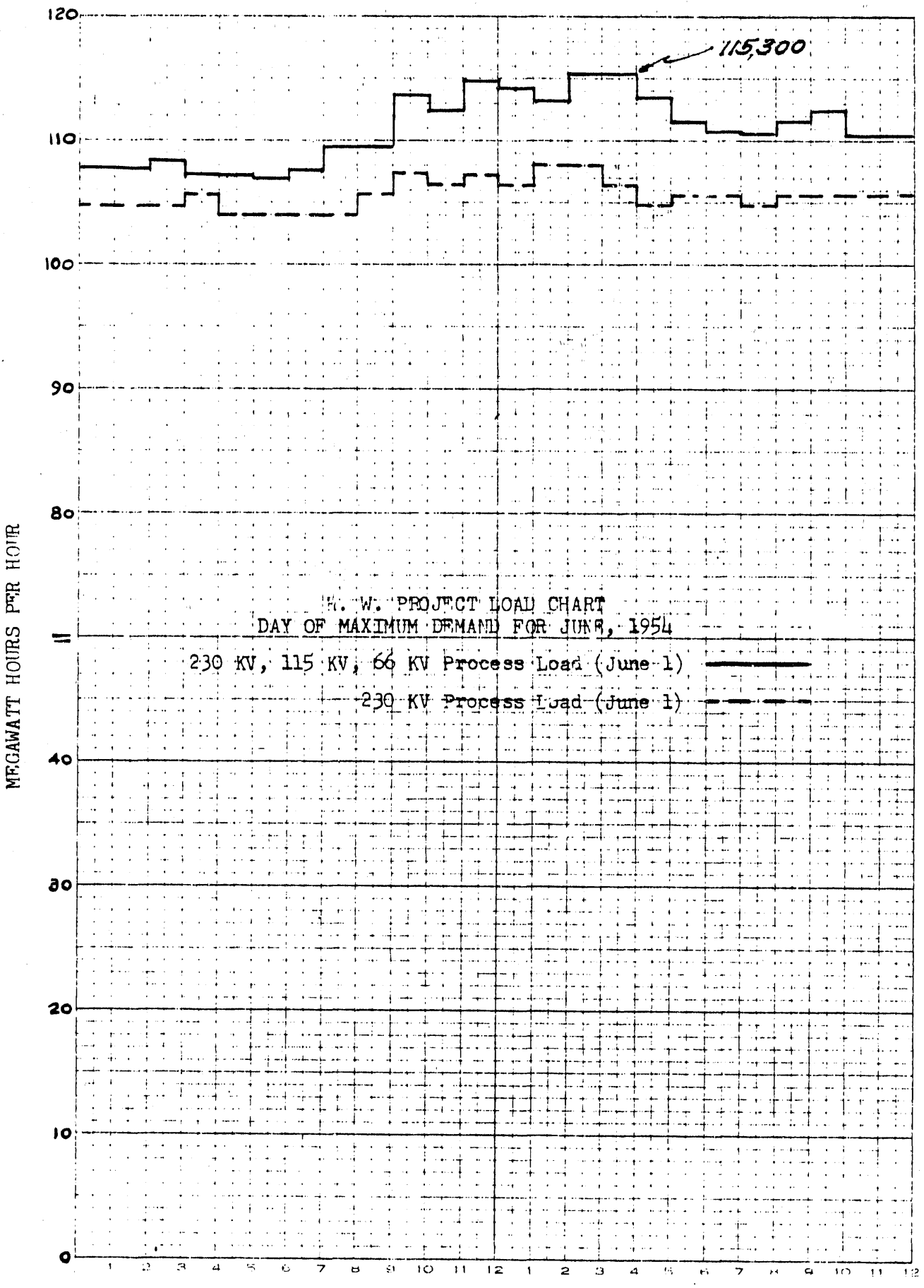
POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING JUNE 30, 1954

	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)	28750	28120	48700	47600	79.3	82.0
A-4 Out (100-D)	16860	16260	26000	25200	87.2	89.6
A-5 Out (100-H)	8370	9950	14500	14600	77.6	94.7
A-6 Out (100-F)	7890	8340	14000	12600	75.8	91.9
A-8 Out (200 Area)	5770	5420	9300	9100	83.4	82.8
TOTAL OUT	67640	68090	112500**	109100**	80.8	86.7
MIDWAY IN	68236	68481	108000*	107200*	84.9	88.7
115 KV System						
B1-S4 Out (N. Rich.)	1675	1459	3629	3110	62.0	65.1
B1-S5	144	151	691	734	28.0	28.6
Richland	8418	7688	17280*	15680*	65.5	68.1
BB3-S4 Out (300 Area)	1816	1808	6400**	3440*	38.1	73.0
TOTAL OUT	12053	11106	28000**	22964**	57.9	67.2
Benton In	12220	11300	32800*	29200*	50.1	53.7
So. Richland In	100	60	16400*	7200*	8.1	11.6
TOTAL IN	12320	11360	49200**	36400**	33.6	43.3
66 KV System						
B9-S11 Out (100-K)	1680	1596	3000	3120	75.3	71.1
B7-S10 Out (W.Bluffs)	417	369	1215	1125	46.1	45.5
Hanford Out	55	31	300**	300**	24.7	14.3
TOTAL OUT	2152	1996	4515**	4545**	64.1	61.0
HANFORD IN	2298	2457(1)	12400*	12800(2)	24.9	26.7
Project Total						
230 KV Out	67640	68090	112500**	109100**	80.8	86.7
115 KV Out	12053	11106	28000**	22964**	57.9	67.2
66 KV Out	2152	1996	4515**	4545**	64.1	61.0
TOTAL OUT	81845	81192	145015**	136609**	75.9	82.5
230 KV In	68236	68481	108000*	107200*	84.9	88.7
115 KV In	12320	11360	49200**	36400**	33.6	43.3
66 KV In	2298	2457(1)	12400**	12800**(2)	24.9	26.7
TOTAL IN	82854	82298(1)	169600	156400(2)	65.7	73.1

* Denotes Coincidental Demand
** Denotes Non-Coincidental Demand
(1) Includes 402 MWH of "K" test power
(2) Includes approximately 8320 KW of "K" test demand

Average Power Factor-230 KV System 90.0
Average Power Factor-115 KV System 87.4
Average Power Factor- 66 KV System 74.8

[redacted]



H. W. PROJECT LOAD CHART
DAY OF MAXIMUM DEMAND FOR JUNE, 1954

230 KV, 115 KV, 66 KV Process Load (June 1) ——————

230 KV Process Load (June 1) — — — —

[redacted]

PLANT AUXILIARY OPERATIONS DEPARTMENT
OPERATIONS ANALYSIS SECTION

MONTHLY REPORT - JUNE, 1954

Personnel Statistics

Following is the month end summary of personnel:

Operations Analysis Section

	As of 5-31-54			As of 6-30-54			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	19	4	23	18	4	22	-1	0	-1
Computing	6	44	50	6	47	53	0	+3	+3
Graphics	1	9	10	1	10	11	0	+1	+1
Procedures	12	3	15	12	3	15	0	0	0
TOTAL	39	61	100	38	65	103	-1	+4	+3

Applied Mathematics Unit

	As of 5-31-54			As of 6-30-54			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	2	3	1	2	3	0	0	0
Statistical Analysis	8	0	8	8	0	8	0	0	0
Mathematical Analysis	3	0	3	2	0	2	-1	0	-1
Numerical Analysis	7	2	9	7	2	9	0	0	0
TOTAL	19	4	23	18	4	22	-1	0	-1

P. M. Anselone was granted a leave of absence until August 16 to attend summer school at Oregon State College.

D. O. Richards attended the eighth annual national convention of the American Society for Quality Control held in St. Louis, Missouri on June 9, 10, and 11. In addition, several meetings were attended with personnel of Mallinckrodt Chemical Works and a member of the St. Louis office of the A. E. C. Statistical techniques and their results pertaining to uranium quality were discussed.

Two papers were presented by members of the Unit at the regional meeting of the American Chemical Society which was held in Richland on June 11 and 12. The first paper gave some rapid approximate statistical procedures for analyzing chemical data. (Mimeo: "Some Rapid Approximate Statistical Procedures for Analyzing Chemical Data," by C. A. Bennett and D. W. Gaylor). The other concerned recent developments in the theory of curve fitting. (Mimeo: "Recent Techniques in the Theory of Curve Fitting," by J. L. Jaech and E. M. Kinderman).

[redacted]

Computing Unit	As of 5-31-54			As of 6-30-54			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	19	20	1	21	22	0	+2	+2
Machine Processing	3	20	23	3	21	24	0	+1	+1
TOTAL	6	44	50	6	47	53	0	+3	+3

One tabulating machine operator was transferred to the Graphics Unit effective 6-14-54. Two tabulating machine operators, one key punch operator, and one clerical working leader were added to the roll for the month.

Graphics Unit	As of 5-31-54			As of 6-30-54			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	5	5	0	7	7	0	+2	+2
Graphic Designers	0	2	2	0	1	1	0	-1	-1
TOTAL	1	9	10	1	10	11	0	+1	+1

Two graphic illustrators were hired and one graphic illustrator was transferred from the Computing Unit to the Graphics Unit. One graphic designer terminated as of 6-11-54 and one graphic illustrator terminated effective 6-25-54.

Procedures Unit	As of 5-31-54			As of 6-30-54			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	11	0	11	11	0	11	0	0	0
TOTAL	12	3	15	12	3	15	0	0	0

[redacted]

FOR THE MANUFACTURING DEPARTMENT

Progress Report # 1 has been issued on the Production Scheduling Operations Research Program. This report presents a mathematical model that illustrates the kind of decisions that can be set up on a mathematical basis, and how this is done. This work will become the basis of the cooperative program with the Manufacturing Department for further study and adaptation of mathematical techiques to aid in the planning and scheduling of Hanford production. Preliminary discussions have already been held between the Manufacturing Department and the Operations Analysis Section. The formulation does not consist of the usual purely linear program commonly found in Operations Research literature, nor, because of the inherent nature of the separations process, does it appear possible to describe plant production in terms of such a model. Since the programming is not of a standard type, one of the following alternatives may be adopted after further study has been made: (1) The "quadratic" character of the program can be circumvented by the similtaneous treatment of a large number of purely linear problems. Such a procedure might prove to be time consuming and costly. (2) Adopt (if possible) those few methods of quadratic programming which are in existence at the present time. These are specialized and exhibit considerable mathematical structure and hence are of limited applicability. (3) Develop by means of mathematical research a new technique for solving this particular problem.

On June 6, B-reactor began operating on a Process test which permitted operation under corrosion temperature limits. As this limit is higher than that allowed for many tubes from boiling considerations, it was necessary to calculate the boiling limit of each tube before startup. The calculation was actually performed three times. The first calculation yielded boiling limits under present operating conditions, thereby indicating to operations personnel which tubes were exceeding the boiling limit or were about to exceed this limit. The remaining calculations were carried out on the hypothesis that the automatic trip mechanisms had been adjusted above and below the present settings by a small amount, thereby yielding boiling limits which could be expected if the adjustments were actually made. By making the indicated adjustment on dangerous tubes, two significant gains may be made: (1) the pile can be made to operate more safely; i.e., by making the trip mechanism more sensitive to plugging conditions; and (2) the pile can be made to operate safely at a considerably higher power level. These calculations will be made routinely. It is generally accepted that the reactor could not be operated in this fashion without these calculations.

A machine procedure for the routine recording, analysis, and reporting of panellit gauge information is presently being developed. When a reactor is operating under boiling limits, it is imperative that the gauge bases for all gauges be readily available to operating personnel. The present method of maintaining a card file in the reactor control room is believed to be too inconvenient and error-prone for efficient monitoring and control of the boiling limits. As a consequence, a new system utilizing punched-card equipment has been proposed and will be put into effect, first at B-reactor and later at D-reactor. Under the new system, all panellit gauge calibrations and adjustments will be recorded on a data sheet and forwarded to the Computing Unit. Once each week an up-to-date listing of tubes and associated panellit gauge information will be prepared for use in the reactor

control room. The gain in accuracy and accessibility provided by this sytem will be especially valuable at D-reactor, where a considerable number of gauges will be calibrated or replaced in the coming weeks prior to the reorificing outage.

The further analysis of attitude survey data for the Separations Section has been completed. Attitudes of employees in twenty-two separate groups, each comprised of one personnel class within a sub-section, were analyzed. In addition to the comparisons of attitudes of a personnel class within a sub-section with those of all employees in that class, comparisons of the attitudes of similar workers within one personnel class in the three sections of the Manufacturing Department were made. A summary of all comments employees in this section wrote on their questionnaires is attached to the report. (Report: "Attitude Survey Results - Separations Section." to R. S. Bell.)

Plant Engineering requested Graphics assistance in illustrating their industrial engineering studies on heat losses in boiler furnaces. Subject matter to be illustrated covers the complete handling of coal from coal car to furnace. Studies on incomplete combustion, causes of piling, gradation, clinkering, aggregate distribution, air and smoke patterns, and coal trajectory patterns from the stoker will be delineated. A graphic illustrator was sent to the area to prepare on-site study sketches and further development of detailed illustrations is now in progress.

Work continued in the fabrication and construction of cell equipment to be installed in the Redox Building Model. This project is scheduled for completion in July and will be delivered to the Separations Section for permanent location within the Redox Plant.

A series of thirteen colored lecture charts were prepared for the Manufacturing Department to use in a recent lecture to Area Operating Personnel.

Other graphic services for the Manufacturing Department included posting current data to and publication of department control charts.

For the Manufacturing Department 3 routine IBM reports and 8 non-routine IBM jobs were completed for a total of 11 IBM service requests.

FOR THE ENGINEERING DEPARTMENT

As a result of some difficulties experienced during irradiation of 25 M material, the Engineering Department has requested that a comparison of the chemical properties of Hanford recast uranium and that cast at Mallinckrodt Chemical Works. Results of this study will be furnished to the Uranium Development Group of the Pile Fuels Sub-Section upon completion of the comparison.

A study of the dimensional changes of 6 M material due to irradiation was completed. (Secret Rough Draft: "Dimensional Changes of 6 M Metal Due to Irradiation", to H. R. Gardner). All significant changes for both the triple dipped standards and the lead dipped slugs at various exposures and pile positions were given with confidence limits on each.

The report on the study of the quality of uranium metal produced at both Mallinckrodt Chemical Works and Feed Materials Production Center was issued. (HW-31246: "Summary of FMPC and MCW Metal Quality - July 1953 Through April 1954".)

A great number of variables are known to affect the quality of a slug. Since it is physically impossible to test all variables by determining slug behavior in the pile for a given set of variables, certain other tests relating to slug quality are conducted. One such test conducted by the Fuel Experimentation Group involves determining the set of conditions when hot-pressing slugs which will give optimum results in testing the bond strength of the slugs. A sequential type experiment is being designed in an attempt to locate these optimum conditions.

The relationship of the distance between atomic planes in graphite and the amounts of exposure of the graphite were determined from experimental data collected by the Pile Materials Unit of the Pile Technology Sub-Section. Weighted regressions were used since all of the measurements were not obtained with equal precision. (Letter: "Relationship Between the Change in Distance Between Atomic Planes in Graphite With Exposure", to J. R. Townsend.)

Zirconium has some desirable properties which may make it useful as an alloy for process tubes. One of its undesirable properties is its brittleness. It has been found that the addition of hydrogen to zirconium reduces this brittleness. A small preliminary experiment was designed in order to test the effects of hydrogren as well as a number of other variables on brittleness. The purpose of this preliminary study is to eliminate collecting future data on factors which show no significant effects. Depending on the results of the pilot study, a statistical design including the important factors will be set up for obtaining information on the effect that different methods of adding hydrogen have on brittleness. The work is for the Applied Research Sub-Section.

Another important undesirable factor in considering zircoloy for process tubes is the growth of the alloy. At a fixed temperature, zircoloy will expand over a period of time. Most metals expand only as the temperature is raised. Since process tubes have to meet rather close tolerances, it is important to know how much growth occurs over long periods of time at various temperatures. Six regressions are being obtained from experimental data collected by the Applied Research Sub-Section in order to predict growth.

Data from the diffusion length tests in KE-Reactor graphite were received this month and processed. A procedure similar to that used for processing data from the KW-Reactor experiment was used. In addition to computing quantities from which the diffusion length of neutrons in these graphite assemblies can be inferred, certain computations were made to assist in the statistical evaluation of the measurements. A novel feature of this computation was the large number of natural logarithms which had to be evaluted. A table look-up operation on computing equipment was used for this purpose, using one of the punched card tables kept on permanent file in the Computing Unit.

Calculations leading to an expression for the weight loss in aluminum by corrosion have been completed. On the basis of certain experimental data, analytical curves were fit by three essentially independent methods. In addition, auxiliary calculations were carried out to assist in a statistical evaluation of the curve fits. The work is part of the continuing study of the corrosion of aluminum.

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Sufficient flow lab data were collected under similar conditions at zero flux by the Pile Coolant Group to enable an estimation to be made of the variation associated with a calculated corrosion rate. Using further flow lab data, a preliminary investigation was made relating corrosion rate to surface temperature for fixed time periods. On the basis of these results, an experiment was designed in an attempt to firm up indicated trends.

A further analysis of the results of Production Test 519, relating to corrosion studies with water type 40, is being made for the Pile Coolant Group. It is known that temperature and time are two variables which strongly affect corrosion rate, but thus far, attempts to find an adequate relationship have failed.

Heat transfer coefficients were calculated for several small groups of data by solving linear equations. The work was done for the Heat Transfer Group.

In the over-all slug rupture program, it is difficult to determine the distribution of slug quality because only the exposure at failure of the "worst" slug in a tube is relevant, and further, the number of tube ruptures observed is comparatively small. However, it is possible to make inferences about the slug quality curve corresponding to a given hypothesis about the rupture rate curve, and vice-versa. This was done at the request of the Advance Technology Sub-Section in three cases, assuming a Weibull and exponential distribution for tube-wise rupture rates, and a normal distribution for the slug quality curve. The intent was to determine if the distribution curves fitted to experimental data gave rise to logical slug quality curves.

Additional procedural work was carried out on the processing of reactor data for the power and exposure study. This study is being made in the continuing effort to correlate slug rupture with observable manufacturing and reactor variables, and is an extension of the original Group Nine Metal Study. Flow charts have been drawn and certain calculator panels wired. At this writing, three months' data are waiting to be processed.

A more general approach to the problem of estimating pile parameters on the basis of buckling measurements has recently been devised. The feasibility of the method was proved by a number of pilot calculations carried out during previous months. In the present method, the buckling of a certain size and type lattice cell is expressed as a function of four essentially independent parameters, which are in turn combinations of basic pile parameters. This expression is then expanded in a Taylor series about an arbitrary point specified by the original guesses at the parameters, and only the first order terms retained. A linear system in four unknowns is thus generated, which can be solved to find the second approximations to the parameters. These are substituted back into the original equations and the process repeated, until satisfactory convergence is obtained. The linear systems are being solved by inverting matrices, since the elements of the inverse are needed to estimate the precision of the parameters, once they have been determined. While the method is straightforward, it appears that computational problems arise over the extreme range of numbers being encountered.

Work is in progress on the computation of heavy isotope concentrations in a thorium slug coated with a jacket of Uranium 235 as a function of exposure. Machine techniques developed earlier for the calculation of isotope concentration in the thorium-uranium network are being used in this problem, with an additional refinement. Instead of assuming a constant flux level throughout the entire exposure period, this period is broken into a number of short intervals. At the end of each interval, the flux is recomputed on the basis of a constant tube power and the concentration of the various isotopes at the end of that interval. In this manner, the actual pile conditions are more accurately represented. In addition to the concentrations, the blackness and the multiplication constant of the assembly are also being computed. A number of preliminary curve fits were necessary to represent certain relations in computable form.

An experiment is being conducted by the Applied Research Sub-Section which will attempt to determine the optimum pile flux level which will result in the smallest percentage of Pu_{240} in the final product. The data collected will consist of a series of decay curves taken at different energy levels, and made up of Np_{240} plus fission products. The statistical analysis will attempt to sort out the various components of each decay curve, and then combine results to estimate the amount of Np_{240} initially present, in addition to making a precision statement about this estimate.

Numerical work on the solution of Wilkin's integral equation is proceeding. Due to the nature of this kernel, straight-forward evaluation was impossible because of the introduction of large computational errors. However, by the use of some of the special properties of the functions involved, a satisfactory method of evaluation has been selected. The range of the integral appearing in this equation was divided into two regions, and the asymptotic form of the solution used to approximate the true solution in one of the regions. The other region was further subdivided, and a numerical integration technique of high accuracy used to evaluate the integral over this range. A 12 x 12 linear system of equations resulted from this operation. Fortunately, this sytem has the property of having a dominant diagonal, and so an iterative method of solution was proposed and programmed. Solutions to the equation have been obtained, but because of the large range of numbers involved, it appears likely that further analysis of the techniques used and their accuracy will have to be made.

At the request of the Experimental Physics Group of the Pile Technology Sub-Section, the error in a numerical integration is being determined. The integration fits a Bessel function to experimental data by equating the two end points and the area under the curve. It is then assumed that the error between the two is experimental error and that the other errors are negligible.

Work completed several months ago on the theory and computation of the change in "blackness" (and hence reactivity) brought about by the melting of hollow slugs during a reactor runaway has been checked with data obtained in a series of experiments conducted by the area physicists. Since the changes predicted by the theory were in good agreement with those actually measured in the experiments, it was decided to submit for publication in the Journal of Reactor Science and Technology a paper describing this work. It is being submitted jointly with a second paper which has been prepared by the experimental physicists.

A method was devised and put into routine use for computing the Fourier coefficients of a function whose values are obtained experimentally at a set of equi-spaced abscissas. A machine method was also devised to effect the so-called "convolution" of two functions to obtain the Fourier coefficients of a third function. Although this technique is to be used in the study of crystal structure to obtain the corrected distribution of intensity across an x-ray diffraction line it may also be of use in spectrum analysis and certain statistical problems.

Computational and statistical work on the single-column experiment at C-reactor is continuing. Of the fourteen calibration curves needed for transcribing coded data into numerical data, eight have been determined. Due to close liaison between the people doing the actual calibration work and people of the Applied Mathematics Unit, it has been possible to obtain the right kind of data in the proper amounts to make possible the fitting of the desired curves and the calculations of the appropriate variance to give an indication, in the future, of a need for recalibration. Programming of the required calculations for machine computation saved considerable time and effort, and made it possible to utilize effectively all the available data. It is estimated that a calibration curve can be determined within two days of the receipt of the data. This time will become significant in the event that one of the monitoring instruments must be recalibrated in the course of the experiment. The delay appears short enough to justify the present method of transcribing the data as opposed to the table look-up method formerly considered.

In anticipation of the purchase of a new spectroscopic instrument, personnel of the Emission Spectroscopy Group ran experiments using one of the new instruments to analyze samples of a given concentration over a period of approximately one-half hour. There was strong evidence of a timewise trend in the results given by the instrument. Unstable electronic components could very likely cause such a trend. To aid the group in making the decision as to whether or not they should purchase one of these instruments if the electronic components could be stabilized, an estimate of the instrument precision was calculated with the trend effect removed. (Oral report made to J. L Daniel.)

Close contact has been maintained with personnel of the Inspection and Materials Unit to follow the progress of the two statistical sampling plans recommended for use in the acceptance sampling of 100 K connectors and 3" expendable dummies. A very high rejection rate has been experienced on the 8" expendable dummies due to the occurrence of a large number of objectionable burrs in the finished product.

The further analysis of attitude survey data for the Project Section is nearing completion. Attitudes of employees in the various personnel classes within each sub-section are being analyzed separately. In addition, a summary of all comments employees in this section wrote on their questionnaires will be prepared.

Additional data on the J-Q (Uranium-Thorium) loading at the H-reactor have been received. Certain revisions in the original procedure for processing these data were necessitated, and these are being made at the present time.

On June 2 the date of July 1 was set as a deadline for the conversion of the Classified Files holding records. Preparations made to facilitate this conversion were: Devised and charted a system for the conversion. The system was approved by Classified Files Supervision. Wrote and charted daily operating procedures for the Computing Unit. This included the wiring of the necessary control panels for the various IBM machines. Instructed the Classified Files staff on the conversion methods. Designed an emergency method to utilize the present Classified Files routing form until a specially designed form can be procured. Developed a system to mechanically account for the transactions of other than Hanford created documents. (These document numbers are of such indeterminate form that they are not amenable to machine processing.) Arranged for the use of the Chief Joseph Junior High School cafeteria for the conversion. These arrangements included delivery schedules and layout for materials, machines and equipment.

In preparation for the above conversion, a time study was made to determine the most efficient method for pulling cards. A mock-up of the operations was set-up and the time study was conducted on two girls pulling cards. This study revealed that a reasonable standard for pulling a card and putting it in its jacket was 0.3 minutes. It also revealed that tilting the trays and using movable posture chairs improved the operation by ten percent.

Conversion of the Classified Files to a daily IBM operation was made, a 70,000 card IBM file of outstanding documents was created. Henceforth daily document transactions will be recorded in this file by machine methods.

The Reactor Fuel Element Operations Research Program is immediately concerned with the following problems: (1) What theoretical distributions form an appropriate background for the overall slug rupture problem? (2) Based on these statistical distributions plus practical considerations, what testing procedures will provide sufficiently reliable data to answer the pertinent questions, but at the same time eliminate the costly collection of excessive data? (3) Based on these statistical distributions, what conclusions can be established from presently available data, and which areas appear most lucrative for future testing? An exhaustive study of the distribution theory involved is now in progress. A number of meetings have been held with members of Pile Technology and Fuel Technology indicating what types of testing procedures are recommended based on preliminary results.

Graphics is preparing a series of detailed perspective cut-a-way illustrations of equipment and mechanisms for the Purex Project Unit. These illustrations are being developed so that a maximum amount of utility may be realized. Each illustration is being prepared as a line reproducible drawing suitable both for enlargement to visual aid size and for reduction to technical publication standards. Additions or deletions required for each program will be made on reproduced hecco-flex master plates and the final air-brush rendering will also be applied to these master plates. Copies of the line drawing reproducibles will be furnished to Engineering for other uses.

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Fuel Technology has placed an order with Graphics for the development of seventeen detailed drawings of principal equipment for the 100-C Slug Examination Facility. Exploded view and cut-a-way techniques are being used to show all components of each assembled piece of equipment.

Other graphics work for Fuel Technology included preparation of schematic drawings illustrating longitudinal, localized, transverse, internal and compound slug failures.

Graphics work for Applied Research included the preparation of fifteen slides and thirteen charts and graphs.

Graphics work for Separations Technology involved preparation of three schematic illustrations, Figure 1 titled "Schematic Arrangement of Metal Line for Tritium Extraction and Purification", Figure 2, "Vacuum Tank Calibration Line", and Figure 3, "Toepler Pump Actuating Circuit Sequential Diagram", and completion of figures for document HW-32100 titled "Boiling Temperatures and Region of Polymer Formation".

A schematic illustration and photo-copy make-up was prepared for Pile Technology to use in document HW-31403 titled "Investigations of Severe Pitting of Slugs and Tubes in the Hanford Pile".

Work in the Purex Building scale model involving modifications, changes and additions, was closed down at the end of this month. At that time the following units were completed as per latest specifications:

I	"H" Cell
II	"J" Cell
III	"Hot Pipe Trench"
IV	Operating Gallery
V	Sample Gallery
VI	Storage Gallery
VII	Main Crane
VIII	The Cold Side.

Funds authorized by Design Order for the Purex Model project have been expended. Other graphics work for the Design Section included preparation of a large visual aid flow chart on the 1706 KER Recirculation Facility and the completion of a series of lecture aids in color to be used in slide presentation on Separation Plant design.

Twenty-four non-routine IBM jobs were completed for the Engineering Department.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

Work continued on the Telephone Operations Research Program to provide a rigorous mathematical basis for determining the optimum number of leased lines to be used by the plant. The model under consideration consists of a cost function relating total cost to the division of calls between leased and toll line facilities, which, in turn, is dependent on the amount of delay incurred through the limitations imposed on traffic by the number of leased lines. Such factors as telephone traffic, time consumed by the operators, holding times, and various cost rates must also be considered.

As part of the Transportation Operations Research Program, a utilization study of various transportation facilities is being made. Basic shuttle and area bus schedules and traffic patterns have been charted and physical and operating data are being accumulated. A one week survey of assigned vehicle and personnel traffic moving to and from the 1131 parking lot to the outer areas has been completed. The transporation driver manpower has been accumulated and charted in a manner to illustrate availability during any twenty-four hour period throughout a normal work week. Trip tickets for the Transportation vehicle pools have been obtained for the same period of time during which the assigned vehicle survey was accomplished. The above data will be used to determine the total amount of equipment in operation at a given time to provide transportation for plant personnel.

The comparison between centralized and decentralized store operations has been completed. A progress report on this phase of the Inventory Control Operations Research Program is forthcoming. In the report, it will be recommended that stores activities be consolidated and that all material (with the exception of laboratory stores) be supplied from one single source, Central Stores, by a new delivery system.

At the request of Central Stores the spare parts storage in the 2713 building was studied to determine the apportionment of storage facilities that would be needed when spare parts were moved into the 2101 building. The study revealed that half the space available in 2101 would be needed for pallet rack and bin storage and half for bulk storage.

At the present time there is an area of duplication of effort when source data is key punched for punched card data processing from previously prepared source documents. A recently announced machine has been ordered which will eliminate the duplication of effort. This machine is an electric typewriter which prepares punched tape as the source document is prepared. By another machine the punched tape is converted to punched cards. This machine will eliminate key punching and machine verification and in effect will result in one operator performing the work of three operators. The first machine will be used as a pilot model for a great many potential applications at Hanford Atomic Products Operation.

In anticipation of earning a safety award as authorized by the "No Accident Safety Award Plan", a procedure was developed covering the selection, purchase, distribution and accountability of awards. The nucleus of the procedure as developed in connection with the Purchasing and Stores Section is the IBM card. The employees will make their selections on cards which will then be mechanically processed by machines. Reports will be prepared by machine to show order quantities and award selection by individual within organization. This will simplify many of the difficulties that would be encountered in a manual system.

At the request of personnel of the Electrical Distribution Section, a study has been undertaken to determine the expected life of the power poles on the plant. It appears as though it will be necessary to establish what measurement or measurements would be appropriate to determine the soundness of a pole and then define what values of the measurement constitute undesirable soundness. Once such definitions have been made, it will be possible to recommend methods of sampling for determining the average soundness of poles in service and also measures of variation for pole soundness.

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Graphics work on Operation Research assignments included preparation of flow charts on machine record and conversion system for the Classified Files conversion program; preparation of a Mathematical Model example flow diagram; preparation of seven charts for the Data Processing study; flow charts on Spare Parts Storage; completion of a flow chart on the "Inventory Control Systems Model"; and completion of various assignments required in publishing Progress Report # 1 on Production Scheduling.

Other graphics work for Operations Analysis included preparation of twelve plates for slide presentation to the Northwest Regional Chemical Society on "Statistical Process for Analyzing Chemical Data."

For the Plant Auxiliary Operations Department, 14 routine IBM machine reports were completed.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

The problem of predicting mathematically the distribution of a contaminant at all points in a flowing river which are downstream from the effluent duct of a retention basin would greatly assist in answering the following questions: (1) What is the level of radioactivity at any point downstream from the plant area? (2) How much heat and radioactive material are transported from the effluent pile of one reactor to the intake pipe of a second reactor which is downstream from the first? (3) At what point in the stream should the effluent duct be placed so as to minimize the concentration of a contaminant at any specified downstream location? Much of the theoretical work has already been completed, but there remains a considerable volume of statistical and computational labor.

Computational work in connection with a statistical study of four years' sheep thyroid data was completed. The ratio of the amount of radioactive iodine fed to an animal to the amount detected by a collar counter or ion chamber was computed for each of some 35,000 measurements. Various sums and averages of the variable thus formed were computed , by animal, by animal group, and by day. These calculations were made independently for each type of detecting instrument used, namely, the collar counter and the ion chamber, so that a comparison of the rsults will be possible.

High concentrations of I^{131} were fed to sheep. Statistical analyses were performed on the resulting data for the Biology Section to determine at what time after the feeding began did signficant changes occur in three important constituents of the blood. (Letter "1800 μc of I^{131} Sheep Feeding", to P. L. Hackett). In addition, some trends in the blood values resulting from these feedings will be investigated.

Preliminary analyses were made of the extensive blood count data which are obtained routinely for plant employees in all areas. R. W. Wager of the Biology Section was contacted in order to discuss whether or not the preliminary results warranted an extensive investigation.

$Pu(OH)_4$ and three levels of PuO_2 were injected in the trachea of mice. The mice were sacrificed at various times following the injections and the amounts of Pu present in the lungs were determined. Curves were fitted to the experimental data relating the per cent deposition of Pu with time. These curves were used by the Biology Section to estimate the biological half-life of the deposition of Pu in the lungs. (Oral report and Charts to R. W. Wager and H. A. Kornberg).

Additional numerical work was carried out on the four-year Aquatic Biology analysis. Using average activities of fish samples previously computed, two types of ratios were computed. The first is intended to yield a comparison between the average activities of all samples from a given location and in a given month with a particular sample type, taken from the same location at the same time. The second ratio will be used to compare the average activities of all samples taken from a given fish with the average activity of the liver tissue taken from that fish under the same conditions. Some 20,000 IBM cards were involved in these calculations, which are part of a thorough analysis being conducted by the Aquatic Biology Unit.

A report describing the existing procedures for recording, analyzing, and reporting a personnel exposure data by the Exposure Records Unit has been completed. The report covers the five phases of the Unit's operation, and in addition contains flow charts illustrating the present badge and pencil procedures. Further investigation of the problem, to be carried out will take two directions: (1) How the presently available computing equipment can be utilized to effect savings in the existing procedures; and (2) How a large scale data processing machine in conjunction with automatic data recorders and transcribers could be utilized to effect savings in the existing, and possibly in revised, procedures. The potential for substantial savings is great.

Routine computational work for the Radiological Science Department consisted of Galvanic Corrosion Effect calculation, weather calculations for May, Wind Study calculations for April and May, Aquatic Biology calculations, thyroid and radioanalysis calculations. Henceforth, weather data will be recorded on punched cards in the field by members of the Symoptic Meteorology group. Also, the Wind Study procedure has been revised to allow recording of wind data on mark-sense cards in the field. By eliminating timeconsuming keypunching, an estimated annual saving of $2,500 will be realized. In addition to the revised method of data transcription, the new procedure will utilize new type equipment and will result in significant savings in time, cost, and paper volume.

The Biology Section has submitted an assignment to Graphics for the preparation of lecture material to be used in a Television presentation in August. The presentation will be to the American Veterinarian Society and will cover the subject "Effects of Atomic Bomb Fall-Out." Layouts are being prepared from rough data and will be reviewed by panel members in the very near future. Experts in the field of TV presentation have been contacted and have furnished Graphics with the basic specifications and requirements for effective TV pick-up.

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Other graphics assignments from Radiological Sciences included requests for the preparation of slide material on the "Distribution of Radiation Survey Meters" and "Instrument Performance and Maintenance". Six graphs were prepared on "Log Nutrient Concentration" for publication in the "Agronomy Journal".

Five routine IBM reports and 2 non-routine jobs, a total of 7 IBM service requests were completed for the Radiological Sciences Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

Statistical analyses of data compiled on employees with high frequencies of absence during the first quarter of 1954 have been completed for the Industrial Medical Unit. The proportions of employees with high frequencies of absence in separate departments and large sections were examined, and a lack of uniformity is apparent. The analyses pointed out that the employees with high frequencies of absence have a higher percentage of their absence time due to personal reasons (not sickness) than do employees with the lower frequencies of absence. Five charts were prepared from the data and a verbal report was given.

Several procedures were prepared to produce non-routine reports for Exempt Salary Administration. These reports were special working listings required in connection with development of the new salary plan.

The current Salary Administration files were corrected to June 10 and then recalculated to establish new gross amounts and expanded to include additional coding and annual gross amounts. Normally the file is corrected at month end.

Graphics service for the Employee and Public Relations Department included preparation of organization charts, salary survey charts, etc., for Salary Administration; completion of display and report charts for Public Health and Safety; furnishing assistance to Audio-Visual Unit personnel in setting up props for photographing Separations Process Building models; and preparation of visual aids for Training and Development.

For the Employee and Public Relations Department 40 routine IBM reports and 4 non-routine jobs were completed for a total of 44 IBM service requests.

FOR THE FINANCIAL DEPARTMENT

Consultations have been held with the Property Accounting Section on methods of presenting various aspects of information about the capital investment at Hanford. A new method of presenting certain fundamental relations is being developed. This will transform certain hyperbolic relationships into linear forms where they may be more readily visualized and understood.

Initial discussions were held with Property Accounting supervision regarding the utilization of a punched card system of accounting. Special emphasis was placed on the "un-installed" category of Plant Accounts with a general analysis and scoping of the entire Plant Accounting problem. The general conclusion was that the tape-preparing Flexowriter provides the most ideal

method of generating punched card records. As the procurement and testing of the Flexowriter will necessitate a delay of several months, it was concluded that the intervening time should be utilized in analyzing the problem of plant classification and in planning the approach to mechanization.

Variations in the acceptance dates for the various unions of the contract has created considerable extra work. Non-union and the Hanford Guards Union employees were paid the new rates on a current basis. The BSEIU employees received the new rates effective for the week ended 6-20-54 and retro-active back to 6-10-54. Special machine operations are now being performed each week for HAMTC employees to provide pay checks at the old rates, salary distribution at new rates and to build a retro-active adjustments files for the difference. It is planned to continue this extra work until the union employees ratify the contract, at which time the retro-active earnings will be paid.

Various payroll reports were prepared for the second retro-active payment to the Guards (Connolly & Black).

The recent general salary increase was calculated and paid on a current basis in spite of the difficulties accruing from the fact that the increase became effective in the middle of a payroll week. This is the first time such an increase has been paid on a current basis. Additional difficulties arose since all unions had not accepted the increase and the increase was paid to only part of the roll. The retroactive accumulation for the unions not accepting promptly are being calculated and carried forward from week to week. This will simplify the payment of the retroactive amounts to those unions.

Several revisions were made in the IBM internal operating procedures at the request of Financial Department. The procedures for the Railroad Switch Report were revised to show where the car was spotted, the purchase order number and the shipper in addition to the information previously shown. The work order procedure was changed to obtain servicing unit for Vehicle Detail Cards from the Vehicle Master Cards. This was necessitated by the organization change in the Transportation Section. A new Bond Purchase and Balance Card form was designed to replace the stock card previously used to record bond balances.

A new procedure was developed for the changing of insurance deduction rates semi-annually on January 1 and July 1. This work had previously been done on an individual work request at the time of each change.

A table of precisions for various numbers of predicted grams of plutonium was calculated for the S. F. Accountability Section, based on the precision of the latest prediction curve. (Letter: "Table of Precisions for Predicted Grams of Pu," to C. B. McKee.) Also for the S. F. Accountability Section, data from recent T Plant cleanouts were investigated in an effort to establish a method of determining the total amount of holdup at a cleanout and the relationship between buildup and throughput. The lack of appropriate data and the cost of obtaining more data indicate that, at present, a reasonably precise estimate of product holdup cannot be obtained. Work is being continued on the calibration curve for tank 15-6.

Graphic services for the Financial Department included preparation of a schedule chart showing suggested methods of offering Richland houses for sale; and preparation of charts and tables on Plant Investment Per Employee and Per KW of Capability.

Presentation material was furnished by Graphics for a lecture given to Manufacturing Department Separations Cost Personnel. This included arranging moving of the Redox and Purex models and furnishing various process building cut-a-way illustrations.

Other graphics services for the Financial Department included plotting of current figures to the HAPO Cost Charts report plate masters; and preparation of a chart on "Excess Materials and Equipment."

For the Financial Department 532 routine IBM machine reports and 22 non-routine jobs were completed for a total of 554 service requests. In addition, 32,342 paychecks and 32,342 earnings statements were prepared and 32,246 cancelled paychecks were reconciled.

FOR THE ATOMIC ENERGY COMMISSION

For the Atomic Energy Commission 3 non-routine IBM reports were prepared.

SUMMARY

During the month of June 117 statistical, mathematical, procedural, and graphical problems were completed, and as of June 30, a backlog of 190 problems were on hand. In addition 594 routine IBM reports and 63 non-routine IBM jobs were completed for a total of 657 IBM service requests; 32,342 paychecks, 32,342 earning statements were prepared, and 32,246 cancelled paychecks were reconciled.

A total of 70 new forms were designed, 304 orders for forms were received of which 3 were rejected and 301 approved for a total of 1,065,143 copies.

Department Serviced	Percent of Services Rendered				
	Units				
	Applied Mathematics	Procedures	Computing	Graphics	Operations Analysis Section
Manufacturing	14	1	3	14	7
Engineering	38	30	30	42	32
Plant Auxiliary Operations	1	5	4	6	4
TOTAL OPERATING DEPARTMENTS	53	36	37	62	43
Radiological Sciences	8	0	2	9	6
Employee & Public Relations	1	3	1	2	1
Financial	2	20	59	3	33
TOTAL STAFF DEPARTMENTS	11	23	62	14	40
Administrative and General	33	40	0	24	16
A. E. C.	3	1	1	0	1
TOTAL	100	100	100	100	100

END

DATE FILMED

6/26/92