[redacted]

727762

HW 29229 -DEL

Copy No.	Series
[redacted]	[redacted]
Pages 383	Copies [redacted]

MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

AUGUST 1953

Compiled By
DEPARTMENT MANAGERS

September 18, 1953

RICHLAND, WASHINGTON

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

[redacted]

Route To	Read By	Date
[redacted]		

[redacted]

[redacted]

DECLASSIFIED

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

[redacted]

1265166

TABLE OF CONTENTS

5 2086 Rev. 9

HW 29229

MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

AUGUST 1953
GENERAL SUMMARY

Production Operations

The reactor input production for the month of August exceeded the July forecast by eight percent. This production was a record one and was attributed mainly to the improvement in the individual pile time operated efficiencies and the slightly higher than anticipated power levels.

There were two regular uranium slug failures during the month. In addition, four other ruptures occurred, three "C" metal slugs and one 63S aluminum canned uranium slug.

T Plant production for the month was 58 percent of forecast, while Redox production was 94% of the July forecast. Operations were curbed at the Redox plant by equipment difficulties. Production of UNH at the TBP plant was 69 percent of forecast. The production commitment was not realized principally because of poor decontamination of young waste feed on a test basis which required extensive rework. UO_3 operations were normal, but output was low because of insufficient feed material. However, 90 percent of forecast was realized. The month's commitment for 234-5 production was exceeded by four percent.

Engineering and Technology

Based on examination of E slugs exposed at specific powers of 60 KW/ft. for 600 MWD, tube power levels at C were increased 100 KW/ tube, resulting in a new high power level at that reactor.

Design progress on Project CA-512-R, 100-K Reactor Facilities was advanced to 96 percent completion during the month. Design activity for the 200 Area Expansion was concentrated on the Purex Waste Facility. Detailed design for this facility is now approximately 75% complete.

Fourteen informal radiation incidents and eight Class I incidents were reported. There was no Class II incident for the first time this year.

Personnel and Services

There were two major injuries during the month, bringing the total for the year to date to ten.

Employee separation rate increased from 1.01% in July to 1.43% in August.

The 1953 National and West Coast Salary Surveys and analysis of the data were completed during August.

The total number of housing applications pending is 465.

STAFF

General Manager, Atomic Products Division	F. K. McCune
General Manager, Hanford Atomic Products Operation	W. E. Johnson
Assistant to the General Manager, Technical	W. I. Patnode
Manager, Administrative Practices	W. K. MacCready
Counsel	G. C. Butler
Manager, Finance	W. W. Smith
Manager, Employee and Public Relations	G. G. Lail
Director, Radiological Sciences	H. M. Parker
Director, Medical	W. D. Norwood, MD
Manager, Engineering	A. B. Greninger
Manager, Manufacturing	C. N. Gross
Manager, Plant Auxiliary Operations	H. D. Middel
Manager, Community Operations and Real Estate	L. F. Huck

HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
AUGUST 31, 1953

	EXEMPT		OTHERS		TOTAL	
	8-31-53	7-31-53	8-31-53	7-31-53	8-31-53	7-21-53
Engineering Department						
General	17	17	77	82	94	99
Design	161	161	38	38	199	199
Project	242	243	328	323	570	566
Technical Section						
General	7	8	3	3	10	11
Applied Research	124	120	62	61	186	181
Separations Technology	139	134	46	45	185	179
Pile Technology	105	105	70	70	175	175
Fuel Technology	63	75	68	74	131	149
Advance Technology	9	10	1	1	10	11
Manufacturing Department						
General	16	16	7	7	23	23
Reactor	249	249	1 032	1 030	1 281	1 279
Separations	305	304	1 197	1 198	1 502	1 502
Metal Preparation	91	92	424	421	515	513
Plant Auxiliary Operations Department						
General	1	1	-	-	1	1
Electrical Distribution & Telephone	31	31	137	138	168	169
Transportation	42	44	457	465	499	509
Purchasing & Stores	49	49	240	241	289	290
Plant Protection						
Patrol & Security	59	61	461	462	520	523
Safety & Fire	43	43	111	111	154	154
Office Services	22	23	298	302	320	325
Administration Main. Service	10	11	51	51	61	62
Statistical & Computing	40	40	57	61	97	101
Community Operations & Real Estate Department	99	99	356	364	455	463
Financial Department						
General	3	4	6	7	9	11
Accounting	46	45	198	197	244	242
Payroll & Auditing	24	25	55	54	79	79
Employee & Public Relations Department	47	47	168	169	215	216
Radiological Sciences Department						
General	5	5	3	3	8	8
Records & Standards	27	26	136	137	163	163
Biophysics	58	59	58	58	116	117
Biology	38	40	33	34	71	74
Engineering	4	3	-	-	4	3
Medical Department	41	40	202	208	243	248
Law	3	3	2	2	5	5
General	14	12	27	28	41	40
TOTAL	2 234	2 245	6 409	6 445	8 643	8 690

AREA PERSONAL DISTRIBUTION
AUGUST 31, 1953

	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	44	67	-	13	30	10	61	69	240	333	867
Other	23	37	3	44	23	3	58	27	210	265	693
Total	67	104	3	57	53	13	119	96	450	598	1 560
Manufacturing Department											
Exempt	80	62	44	67	7	-	1	287	89	24	661
Other	249	276	400	156	-	-	110	1 062	398	9	2 660
Total	329	338	444	223	7	-	111	1 349	487	33	3 321
Plant Auxiliary Operations Department											
Exempt	26	9	7	8	8	-	19	20	15	185	297
Other	60	65	106	57	51	11	88	189	112	1 073	1 812
Total	86	74	113	65	59	11	107	209	127	1 258	2 109
Community Operations & Real Estate Dept.											
Exempt	-	-	-	-	-	-	-	-	-	99	99
Other	-	-	-	-	-	-	2	-	-	354	356
Total	-	-	-	-	-	-	2	-	-	453	455
Financial Department											
Exempt	-	-	-	1	-	-	1	1	2	68	73
Other	-	-	2	1	-	-	2	1	-	253	259
Total	-	-	2	2	-	-	3	2	2	321	332
Employee & Public Relations Department											
Exempt	-	-	-	-	-	-	-	-	-	47	47
Other	4	5	6	2	2	1	10	4	34	100	168
Total	4	5	6	2	2	1	10	4	34	147	215
Radiological Sciences Department											
Exempt	1	-	42	-	-	-	2	18	55	14	132
Other	5	-	35	-	-	-	5	19	154	12	230
Total	6	-	77	-	-	-	7	37	209	26	362

	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
Medical Department											
Exempt	-	-	-	-	-	-	-	-	-	41	41
Other	1	4	4	1	-	-	1	6	1	184	202
Total	1	4	4	1	-	-	1	6	1	225	243
General											
Exempt	-	-	-	-	-	-	-	1	1	15	17
Other	-	-	-	-	-	-	-	-	12	17	29
Total	-	-	-	-	-	-	-	1	13	32	46
Total Exempt	151	138	93	89	45	10	84	396	402	826	2 234
Total Other	342	387	556	261	76	15	276	1 308	921	2 267	6 409
Grand Total	493	525	649	350	121	25	360	1 704	1 323	3 093	8 643

MANUFACTURING DEPARTMENT

AUGUST, 1953

METAL PREPARATION SECTION

The net production for the month was 244 tons which was 19 percent over the July forecast. This production was a record performance for the Section. A total of 213 tons was canned as 8-inch material and 31 tons as 4-inch. The overall combined canning yield was 80.2 percent which represented an increase of 8 percent over the previous month. This yield was due principally to reduction of rejects caused by non-seats, marred surfaces and poor bonding.

A large quantity of used bronze crucibles and discarded furnace insulation has been prepared for off-site shipment for uranium recovery. It is expected that five tons of material will be recovered.

There was one 4-inch slug autoclave failure during the month.

REACTOR SECTION

The input production for the month of August exceeded the July forecast by eight percent. This production was a record for the Section and was attributed mainly to the improvement in the individual pile time operated efficiencies and the slightly higher than anticipated power levels.

The C reactor level was increased 55 MW during the month and this resulted in passing the 1000 MW mark for the first time in Hanford history. This increase was made possible by increasing certain tube power limits. All front crossheaders at C reactor were flushed to reduce the possibility of cone screen plugging by foreign material. A considerable amount of foreign material was successfully removed from the headers even though they had been thoroughly flushed before startup.

There were two regular uranium slug failures (one 4-inch and one 8-inch) during this period. Total outage time charged to these failures was 62.4 hours. In addition, four other ruptures occurred, three "C" metal slugs and one 63S aluminum canned uranium slug. The outage time charged to these failures was 39.4 hours.

Tests continued at the B reactor with the new charge-discharge-while-in-operation equipment. This facility was used for the first time in discharging a regular uranium loaded tube while the pile was operated. Only minor difficulties were encountered in flushing the full charge from the tube.

During August, 27 reactor scrams occurred with a total outage time of 351.8 hours. Twenty of these were attributed to the panellit systems with an outage time of 36 hours Other scrams were caused by a plugged cone screen, failure of a Beckman fuse, electrical power surge, tripping out of a 190 process pump and a failure of a Ball 3X relay.

SEPARATIONS SECTION

The Redox production for the month was 94 percent of the July forecast, while the T Plant production was 58 percent of the forecast.

The average operating rate was 4 tons per day, with an efficiency for the month of 86 percent. Operations were curbed at the Redox plant from the first of the month until the eighth as the August 28 shutdown continued beyond the planned outage time due to many equipment difficulties. The shutdown was made to install a (replacement) centrifuge, replace several H cell jumpers and to attempt the revision of the H-1 and H-3 venting system after startup. When operations resumed poor decontamination in the uranium cycle made it necessary to rework some material. That which remained (42 tons) was transferred to the TBP Plant for further decontamination. On August 18, a 6 ton per day rate using virgin feed, was started. By month end the rate had been increased to a rate of seven tons.

The TBP plant produced a total of 166 tons of UNH, which was 69 percent of the July forecast. In addition, 42 tons of Redox UNH were decontaminated. Feed rates varied on both lines between 3.0 and 6.0 tons per day. The production commitment was not reached due principally to poor decontamination of the test feed material from 101-BS (2.5 years decayed) with resultant rework and the processing of the Redox material. Further, poor decontamination and high waste losses dictated shutdowns during mid-month and at month end for extensive column and vessel flushings.

The removal of metal waste from the tank farms proceeded well during the month. Tanks 102-U, 103-U and 103-C were officially declared empty.

The UO_3 operations were normal, but output was low the first half of the month because of insufficient feed material. The average operating rate was 9.6 tons per day and 90 percent of the forecast was realized.

The August commitment of final shapes was exceeded by 4 percent.

The West Area evaporator operated the entire month successfully, depleting tanks 107 and 108-T of TBP waste. The East Area evaporator was inoperative during the month for extensive maintenance work.

GENERAL

Personnel

Total of Roll August 1, 1953	3318
Accessions	40*
Separations	36*
Total on Roll August 31, 1953	3322

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

HW-29229

[redacted] MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF AUGUST, 1953

Richland, Washington
September 9, 1953

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

INVENTOR	TITLE
E. F. Fairweather, Reactor Section	Calculators, special purpose circular slide rule type, designed specifically to calculate radiation exposure of personnel working in radiation zones.

J. E. MAIDER, MANAGER

MANUFACTURING DEPARTMENT

[redacted]

Ea-1

[redacted]

[redacted]

[redacted]

1203001

[redacted]

[redacted]

V. D. Donihee
V. D. Donihee

Section 11 - Technical and calculated values provided by SF Accountability Section.

1265003

[redacted]

DECLASSIFIED

Richland, Washington
September 10, 1953

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
AUGUST, 1953

I. RESPONSIBILITY

Responsibilities of the Section remained unchanged.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	August	July	Year To Date
Acceptable Pieces Canned (4")(Tons)Gross	32	14	187
Acceptable Pieces Canned (4")(Tons)Net	31	12	181
Canning Yield (4")(%)	78.7	69.8	66.5
Acceptable Pieces Canned (8")(Tons)Gross	214	205	1253
Acceptable Pieces Canned (8")(Tons)Net	213	203	1240
Canning Yield (8")(%)	81.8	74.6	72.4
Total Acceptable Pieces Canned (Tons)Gross	246	219	1440
Total Acceptable Pieces Canned (Tons)Net	244	215	1421
Acceptable Pieces Canned (4" and 8") (% of Forecast)	119	105	106

[redacted]

1. Statistics (Continued)

	August	July	Year To Date
Autoclave Frequency (4")(No./M)	.05	.00	.03
Autoclave Frequency (8")(No./M)	.00	.02	.02
Oxide Burned (Weight out Tons)	3	5	39
Poison Canned (Number Pieces)	0	0	4450
Chemical 68-56 Canned (Number Pieces)	0	0	0
Chemical 10-66 Canned (Number Pieces)	0	264	1713
"J" Slugs Canned (Number Pieces)	0	16	12120
"N" Slugs Canned (Number Pieces)	505	2628	17141
Special Requests (man hours)	1474	1457	12005
305 Routine Tests (man hours)	189	159	1137
305 Special Tests (man hours)	972	736	8627
Average Steam Generated (M lbs/hr)	19.6	16.4	
Maximum Steam Generated (M lbs/hr)	56.0	52.0	
Total Steam Generated (M lbs)	14,600	12,200	
Coal Consumed (Tons)	976	824	
Sanitary Water from 3000 Area (Million gals.)	51.6	46.6	
Total Water Average Rate (gpm)	1155	1044	
Chlorine Residual	.40	.32	

2. Activities

The net production of acceptable slugs attained a new high of 244 tons of which 87% were eight inch. The combined canning yield increased 8% over the previous month largely as a result of reductions in the non-seating, marred surface, and poor bond categories for eight inch slugs and reductions in marred surface and bad weld reject categories for four inch slugs.

There was one autoclave failure of four inch material during the month.

The 305 Test Pile began two shift operation on 8-24-53 to accommodate the accelerated graphite testing program.

Two hundred fifteen drums of used bronze crucibles and one hundred thirty-four drums of furnace insulation were prepared for shipment off-site for uranium recovery.

The practice of cleaning AlSi prior to charging was continued and it appears that this has contributed materially to the reduction of non-seating rejects by the elimination of impurities from the canning bath.

A statistical procedure for weighing of bare slugs received from Fernald is being investigated. Preliminary results indicate true weight ac-

2. Activities (Continued)

curacies much greater than obtained by 100% weighing may be expected. If found feasible, the expense of weighing all slugs along with attendant safety and health hazards might be eliminated.

During the month thorough cleaning of autoclaves, baskets and liners along with storage of such components inside buildings has resulted in a marked reduction of stains from that previously experienced in autoclaving.

3. Special Operations

The fabrication of hollow slugs for the exponential test pile program was completed on 8-11-53 and the lathes were cleaned up in preparation for their removal.

The lead dip canning of eight inch beta heat treated slugs under provision of PT-313-105-25M was completed on 8-13-53. There were 170 tons of acceptable slugs processed under this test.

The lithium-aluminum alloy target slug fabrication phase of the P-10 program was completed during the first week of the month. A total of 17,141 target slugs have been shipped to Reactor, and an overall canning yield of 77% was realized.

Two hundred seventy enriched uranium-aluminum alloy fuel slugs were canned by the wet AlSi capping method. Considerable difficulties were encountered with this method and it does not appear to be promising.

4. Schedule Variance

Acceptable slug production exceeded forecast by 19% as a result of improved canning yields and higher operating efficiencies than expected.

B. Equipment Experience

1. Operating Continuity

A minimum of production time was lost due to failures of operating equipment. There were five furnace failures as compared with eleven failures for the previous month.

2. Inspections, Maintenance and Replacements

Power house boiler number 3 was inspected by a Traveler's Insurance Company inspector and found to be in good condition. Unfired pressure

2. Inspections, Maintenance and Replacements (Continued)

vessels were also inspected and with minor exceptions were found to be in good condition. The power house stack was inspected and found to be in good condition. Minor repairs have been completed.

The chip pickling line, no longer in use due to discontinuance of that operation, was converted to an additional slug pickling line. Minor piping rearrangement and moving of a dryer completed the conversion.

C. Improvement Experience

1. Production Tests

PT-313-105-18M "Irradiation of Ultrasonically Tested Salt Bath Heat Treated Alpha Rolled Uranium Slugs" - (HW-26759).
A total of 5724 four inch and 244 eight inch slugs remain to be shipped on this test. Ultrasonic testing was completed on 2-19-53.

PT-313-105-19M "Irradiation of Triple Dip Canned Uranium Slugs from Rods Rolled at Fernald" - (HW-26851).
Approximately 20,000 four inch slugs were canned on this test during the month with a yield of about 85%. Poor bonds were the highest single reject category.

PT-313-105-23M "Evaluation of Fillerwelding of Eight Inch Triple Dipped Canned Slugs" - (HW-27934).
This test is about 50% complete at month end. The "Fillerweld" equipment operated satisfactorily and the resultant slug was generally of quality comparable to normal. As would be expected with a new welding technique, there were more than normal number of welding rejects.

PT-313-105-24M "Pile Evaluation of Tru-Line Caps and Cans" - (HW-28040).
Approximately 1000 eight inch slugs were canned on this test on 7-31-53 with a yield of about 85%. The 5.4% rate of AlSi rejects constituted the highest canning rejection category. Certain facing difficulties which necessitated the use of an additional lathe were experienced while processing this material. All other operations proceeded smoothly.

PT-313-105-25M "Lead Dip Canning and Irradiation of Uranium Slugs Machined from Salt Bath Heat Treated Fernald Rolled Rods" - (HW-28149).
Canning on this test was completed on 8-13-53 with a total of 170 tons of acceptable material canned with an overall yield of about 80%. The test began with a high incidence of non-seats and frost test rejects. The most effective corrective measure was lowering the slugs as deeply as possible into the lead bath. After the first day the non-seats were reduced to about 1% and frost test 5.6%. This affected the overall yield with non-seats being 1.7% and frost test 6.9%.

C. Improvement Experience

2. Process Tests and Revisions

MMP-313-3 "Slug Recovery by the Use of 50% Caustic."
Slug recovery utilizing 50% caustic on a production basis performed satisfactorily during the month. Although data are incomplete it appears that increased production throughput can be realized. It was found that lead dip material can be recovered in about two-thirds the time required for triple dip material. Recanning of slugs has been satisfactory.

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

Continued improvement in the yield for finished slugs decreased direct labor costs slightly. The overall effect of yield improvement was partially offset by a decrease in special production work and work for Technical.

2. Material Variance

Lower material requirements for lead dip canning and the improved canning yields decreased material costs significantly.

3. Other

Increased production volume caused a lower unit cost attributable to "other costs" although the total has not changed appreciably.

E. Plant Development and Expansion

1. Project Status

Project CA-514. "Expansion of 300 Area Production Facilities". Work Authority CA-514 (5), dated July 17, 1953 increased the total authorized funds from $600,000 to $1,200,000 for AE and AEM functions to be performed by the General Electric Company. A subsequent Work Authority CA-514 (6) dated August 7, 1953, sets forth the general functions to be performed by the General Electric Company and those to be performed by prime AE contractors under AEC management.

1. Project Status (Continued)

Detailed design of the 313 building is 58% complete and construction 11%. Considering the recent change in the scheduled completion of the first phase of construction from September 28 to October 14, 1953, construction of this phase is 49% complete and on schedule. The railroad spur is essentially complete and work is continuing on building foundations. Structural steel is arriving on site and erection was started on August 25, 1953.

The final drawings and specifications for the second phase of construction on 313 building have been received from the Architect-Engineer and are being reviewed. This phase includes the placement of a built-up roof over the steel decking the construction of floor slabs and partitions and the installation of electrical, steam, air, water and sewage services. It is expected that contractual data will be complete and transmitted to the AEC for contract negotiations early next month.

Construction of the new operations change house is 94% complete with a scheduled completion date of September 1. The major items remaining to be completed are installation of fire detection system master box, the supply ventilation system and a portion of the exhaust ventilation system. Delivery of the master box is not expected before October and the supply ventilation unit about mid-September. Beneficial occupancy will probably be delayed until October.

Design of all other non-process facilities is about 42% complete. The extension of the roads and walks from the 3701-L gate house to the new operations change house has been included in the present contract with the Hopkins Company and this work is to be completed early in September. Expansion of the parking lot and gate house is to be included in the contract for the second phase of construction facilities.

2. Plant Engineering

Work is being continued on the review and revision of labor and material cost standards for the triple dip and lead dip canning processes. In addition preliminary work has been completed toward establishing tentative maintenance and other IME standards. Use of standard costs in the preparation of cost forecasts was initiated during this period.

Testing of the clamping type basket for the pneumatic canning jacks on the production line was completed during the month. The results of the test indicate the clamping mechanism is entirely feasible from an operating standpoint to insure a minimum variance in the preheat and submerge phase of the assembly cycle. Further testing of this unit is planned to coincide with operations testing of the semi-automatic capping unit.

Preliminary design is in progress on a centralized control station for the various mechanical units being applied on each canning line.

2. Plant Engineering (Continued)

The spray-type rinse unit for the can preparation operation was completed during the month. This unit accommodates 60 aluminum cans and provides a water jet scrubbing action to both the inside and outside surfaces of the cans.

F. Significant Reports Issued

1. Routine

Number	Title	Author	Date
HW-28911	Monthly Report, Process Sub-Section Metal Preparation Section, July, 1953	E.W. O'Rorke	8-1-53
HW-28959	Interim Report No. 5 on P-10 Slug Production, August 1, 1953	H.G. Henry	8-1-53

2. Non-Routine

HW-28938	Effect of Autoclaving on P-10 Target Slugs	D.L. Cornell	8-5-53
HW-28989	Uranium Content of Scrap AlSi	W.G. Hudson	8-10-53
HW-28997	Elimination of Vertical Agitation in the Bronze Bath	C.H. Pitt	8-10-53
HW-29099	Interim Report on Evaluation of Slug Canning by a Long Preheat-Short Submerge Method	L.P. Reinig	8-21-53
HW-29104	Analytical Report on Lithium-Aluminum Target Material	W.G. Hudson	8-24-53
HW-28869	Project CA-514 "Storage Space Survey"	J.W. Nageley	7-29-53
HW-29092	Project CA-514 "Cutoff Machine Design"	J.W. Nageley	8-21-53

III. PERSONNEL

A. Organization

No change.

B. Force Summary

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations	207	207	0
Power & Maintenance	250	250	0
Process	29	32	3
Plant Engineering	20	19	- 1
Radiation Monitoring	3	3	0
Section Total	513	515	2

C. Safety Experience

There were no major, one sub-major injuries in the Section during the month.

Five barrels of drilled slug turnings ignited on August 14, 1953. No damage resulted other than to the barrels.

D. Radiation Experience

No exposures in excess of 300 mrep per week were reported during the month.

E. Personnel Activities

1. Visits and Visitors

None.

2. Information Meetings

Fifty-five members of supervision attended the first lecture series of the course "Principles and Methods of Radiological Protection." The course is continuing.

Three technical training films, "Fundamentals of Radioactivity", "Properties of Radiation", and "Practical Procedures of Measurement" were shown to Section personnel during the month. Process personnel reviewed the film "This is Aluminum".

Richland, Washington
September 10, 1953

MANUFACTURING DEPARTMENT
REACTOR SECTION
AUGUST, 1953

I. RESPONSIBILITY

Agreement was reached during the month that the Engineering Department, Project Section would be responsible for all Title III services in connection with Project CA-512 (100-K Plant). In effect, this assigned the Engineering Department the direct responsibility for inspection and acceptance of the completed facilities from the standpoint of operability and safety. An Organization and Policy Guide is planned for later release.

II. ACHIEVEMENT

A. Operating Experience

The total reactor input production for plutonium during August was 108.3 percent of forecast and 0.4 percent greater than in July. This represents new monthly and per diem production records. August was the fourth consecutive month of establishing a new per diem record.

Forecasts were exceeded due to higher than anticipated power levels and time operated efficiencies. Reactor output production was 102.0 percent of forecast.

The established maximum operating level of C Reactor was increased 55 MW during August (maximum level included 11 MW of "C" metal burnout) and resulted in passing the 1000 MW milestone. This increase was attributable to increasing the tube power limits as specified in PT-105-533-A (Local Controlled Increase in C Pile Tube Powers).

There were two regular slug failures (4 inch, Group 8) during the month, one at D Reactor and one at F Reactor. Total outage time charged to these slug failures was 62.4 hours. In addition, at H Reactor, three "C" metal slugs

A. Operating Experience (Continued)

and a 63S aluminum canned uranium slug (PT-313-105-17-M) failed. The "C" metal slugs were all removed from the same tube during an outage initiated by the panellit. The 63S slug failure was accompanied by a process tube rupture which allowed water to enter the moderator. At month end, the hot water recirculation system was being operated in order to dry out the reactor. The August portion of this outage was 39.4 hours.

Details of reactor and water plant operation are set forth below:

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	93.0	89.2	87.5	99.9	92.3	90.8	92.1
Reactor Outage Time (Hrs.)							
Plutonium Production	36.8	65.5	68.1	0.8	50.1	0.8	222.1
Special Irradiations and Tests	15.6	15.1	24.0	-	6.3	67.4	128.4
Electrical Power Supply*	-	-	0.6	-	0.7	-	1.3
Total	52.4	80.6	92.7	0.8	57.1	68.2	351.8
Reactor Unscheduled Outage Time (Hrs.)	5.4	7.0	32.6	0.8	57.1	68.2	171.1
Metal Discharged (Tons)	18.5	49.0	19.3	-	10.8	18.1	116
Water Quality (ppm Iron)							
Raw Water - Average	0.07	0.07	0.07	0.09	0.05	0.07	-
Raw Water - Maximum	0.09	0.10	0.12	0.19	0.07	0.10	-
Process Water - Average	0.018	0.006	0.004	0.005	0.007	0.020	-
Process Water - Maximum	0.026	0.023	0.013	0.009	0.028	0.028	-
Water Pumped (MM gals.)							
Bldg. 190 to reactor	1655	3140	1958	1921	1627	2192	12493
Bldg. 182 to 200 Areas	347	-	81	-	-	-	428
Bldg. 181	5854		4776		1996	2527	15153
Steam Generated (MM lbs.)	138		224		120	106	588
Coal Consumed (Tons)	8547		14670		7836	6551	37604

*Power surge on BPA electrical system.

2. Activities

No further incident of ball release due to the Ball 3X Systems being on automatic operation was experienced during August. Investigation of the 35 to 65 inhour reactivity loss in the top far quadrant of D Reactor, reported last month, revealed a number of balls lodged in VSR channel cracks. However, dislodging an estimated 500 of these, so that they dropped to the bottom of the channels, has not appreciably

2. Activities (Continued)

reduced the reactivity loss. Other details concerning these facilities are given under "Plant Development and Expansion".

Use of facilities at B Reactor for charge-discharge of poison columns during operation (PT-105-4-MR) continued to result in significant production gains. These gains amounted to an estimated 425 MWD during August. Also, under Supplement A of PT-105-4-MR, an irradiated uranium column was discharged using these facilities with the reactor operating at 350 MW. This was the first time uranium had ever been discharged during reactor operation. The test demonstrated the feasibility of performing this operation although some minor difficulty was encountered in flushing the uranium charge from the tube.

During a scheduled outage of C Reactor early in the month, several steps were taken to increase the reliability of the process water system preliminary to the power level increase noted above. The trip ranges of the panellit gages for tubes in the 0.200 inch orifice zone were reduced and gages for all tubes were checked for operability. Also, all front crossheaders were flushed to reduce the possibility of cone screen plugging by foreign material. Sixty-three header cap lead discs, approximately 25 pieces of front nozzle cap gasket material and several pieces of weld slag were flushed from various crossheaders. Apparently this material had been in these crossheaders since the initial reactor startup.

Delivery of coal to the 100 Areas was resumed on August following negotiation of a new HAPO coal contract.

Activated silica addition for water treatment was discontinued at the F Water Plant on August 14. All water plants using the alum process are now operating without activated silica, the need for which is seasonal in nature.

A program has been underway for several months to remove unnecessary temporary construction buildings from the 100 Areas. During August, the Atomic Energy Commission relieved the Reactor Section of responsibility for the last of three temporary warehouses and a number of miscellaneous small buildings.

Irradiation of P-10 material at DR Reactor continued during August. The reactor operating level continued to be limited by a P-10 tube power limit of 425 kw. Calculations indicate that further enrichment of the reactor will be necessary by late September if the present production levels are to be maintained.

The following tabulation indicates activities during August associated with special irradiations other than the P-10 program noted above:

2. Activities (Continued)

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	1	3	0
Chemical 72-60	0	2	0
RALA	0	0	0
Production Tests	41	35	1
Total	42	40	1

B. Equipment Experience

During August, 28 reactor scrams occurred. Twenty of these were attributable to the panellit system, one to a plugged cone screen, two to failure of a Beckman fuse at B Reactor (C Reactor was shut down simultaneously through the high level tie circuit), two to an electrical power surge caused by lightning on the BPA System, one to unexplained tripping out of a process pump, and one to failure of a Ball 3X System HR relay. Outage time charged to the panellit scrams was 36.0 hours, 26.0 hours of which occurred when a defective row relay at H Reactor prevented startup within the minimum recovery time. Total outage time resulting from the other scrams was 4.2 hours. Most of the panellit scrams were unavoidable under present operation of the panellit system, however, some were due to human failure while maintaining the panellit gages. In order to avoid those in the latter category, the Instrument Unit has increased emphasis on procedures and training of personnel.

At H Reactor, "B" horizontal rod was removed from service due to a water leak in the rod tip.

Two leaks developed in the 20-inch cast iron emergency raw water line in 100-B Area during the month. The first occurred when an 18-foot section of the pipe split lengthwise along its entire length and resulted in loss of export water backup at both B and C Reactors. The second leak occurred in a bell and spigot joint near Building 105-B and affected only backup to B Reactor while the joint was being recaulked. Repairs were made without shutting down either reactor.

An inspection of the east Bldg. 107-C retention tank revealed that the weld connecting the first and second baffles to the tank wall have partially broken loose. Temporary repairs are in progress and a study is being made to determine needed permanent repairs.

Work by Minor Construction forces aimed at correction of vibration in Bldg. 190-C piping is continuing. Installation of re-designed orifice transition section in the pump recirculating water system has appreciably reduced the vibration in the recirculating water lines.

A representative of Traveler's Insurance Company inspected one boiler in the 100-B, D and F Power Houses in connection with the annual boiler inspection program. Two of the 17 boilers in the 100 Areas remain to be inspected.

C. Improvement Experience

The most significant Production and Process Test activities are reported below:

C. Improvement Experience (Continued)

PT-105-4-MR (Evaluation of Poison Column Control Facility)
See item above under "Operating Experience".

PT-313-105-17-M (Irradiation of 63S Aluminum Jacketed Slugs)
As reported above, one of these slugs failed during the month at H Reactor. Inspection of the other test pieces in the same tube indicated they were in good condition so the remaining 23 tubes of this material were left in the reactor.

PT-105-513-E (100 Areas Process Water Quality Evaluation Tests)
During August, the alum process replaced the ferric sulfate process as the standard for 100 Area water treatment. This cancelled this test except for Supplement A which is being run at the DR Water Plant to evaluate the effect of discontinuing the use of chlorine. Plans are being made to initiate use of the alum process in the B and H Water Plants as soon as necessary equipment changes can be made.

PT-105-519-E (Raising Permissible Outlet Water Temperature of Selected Tubes at C Pile)
The nine small annulus tubes operated at the desired outlet water temperatures following the increase in C Reactor power level during August. These tubes are specified for operation at 95° C, 100° C, and 105° C in order to investigate corrosion rates at elevated temperatures.

PT-105-531-A (Enrichment at H Pile)
Three "C" metal slugs ruptured during August as noted above under "Operating Experience". The discharged tube was reloaded with "C" metal, thus the number of enriched tubes remain at 48. Enrichment burnout has resulted in an appreciable loss of reactivity and a corresponding decrease in the flattened zone radius. The power level of the reactor is currently limited by a 410° C graphite limitation with the helium concentration being held at the maximum allowable (30 percent).

PT-105-533-A (Local Controlled Increase in C Pile Tube Powers)
Power limits of normal and bumper zone tubes were increased to 700 kw and 820 kw, respectively. Subsequent power level increases resulted in the established maximum power level being increased 55 MW.

PT-105-534-A (D Pile Operation with Maximum Panellit Monitor Protection)

PT-MR-105-12 (Operation of H Reactor with Maximum Protection from Panellit System)
No further increases in established maximum operating

C. Improvement Experience (Continued)

levels were made in connection with these tests. D Reactor power level was limited by the 70° C process tube water temperature rise limit and H Reactor by a 410° C graphite limit.

PT-MR-105-10 (Filter Capacity Test - 100-B Area)
This test was completed during the month. Record filter flow rates of 6100 - 6500 gpm per filter unit (5.3 - 5.6 gpm per sq. ft.) were achieved.

PT-MR-105-14 (Unit Cost Reduction by the Use of Supplemental Orifices)
In-reactor testing of both venturis and double orifices is in progress at B and D Reactors. A total of 30 venturis and 20 double orifices are performing satisfactorily.

Three new and five revised Reactor Cooling Water Process Standards were approved during August. Six of these standards were in connection with adopting of the alum-activated silica water treatment process, one controls the possibility of air entering a process tube, and the other provided a new limit on the permissible amount of process tube purging.

The report of invention indicated below was submitted during August:

Inventor	Invention
E. F. Fairweather	Calculators, Special Purpose Circular Slide Rule Type, Designed Specifically to Calculate Radiation Exposure of Personnel Working in Radiation Zones.

D. Events Influencing Costs

Improvement in the quality of river water resulted in a decrease in coagulation chemical consumption amounting to approximately $13,800.

A total of approximately 210 tons of anthrafilt was added to filter beds in 100 Area Water Plants, except C Water Plant, to replace normal losses. The cost of this program is anticipated to be about $11,000.

A slight increase in production during August is expected to result in a minor decrease in the Reactor Section irradiation unit cost since no appreciable change in total cost is anticipated. This may be a new unit cost record and represent achievement of the Diamond Jubilee cost goal.

E. Plant Development and Expansion

1. Project Status

The most significant Reactor Section project activity is reported below.

1. Project Status (Continued)

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 E. P. Lee, dated August 21, 1953.

CA-431 (100-C Plant)
Minor Construction forces continued work on construction items at the Reactor and Water Plants. Items completed during the month included the "Pluto"crib and sump facility for Building 105-C and the annunciator system for the Building 183-C pump room.

CG-438 (Ball 3X Facilities for B, D, F, DR and H Piles)
The operation of these facilities is reported above under "Operating Experience". During August, the low water pressure trip and "SN" circuits at B and D Reactors were revised according to new design specifications aimed at improved reliability.

CG-512 (100-K Facilities)
Reactor design is approximately 93 percent complete and Water Plant design 82 percent complete. Over-all project construction is estimated at 24 percent. At Building 105-KW, the bottom biological shield crates are being set on the reactor foundation and installation of service piping, electrical wiring, siding and roofing is in progress. The exhaust air stack has been completed and supply fans have been placed in service. At Building 105-KE, the major building walls have been completed. Placement of concrete for Building 181-KW and 181-KE (river pump houses) has been completed.

CG-558 (Reactor Plant Modification for Increased Production)
This work was previously reported under the heading RDS-D-10 and 11. Authorization has been received for expenditure of $100,000 for preliminary design, scoping, and preparation of a project proposal covering detailed design and construction.

CG-482 (Pile and Pile Water Plant Improvements)
CG-502 (Additional Indication of Moderator Temperature - 105-B, D, F and DR)
B-2098 (Replacement of Heating Coils in Building Ventilation Systems)
The above three project items were completed during August.

2. Plant Engineering

A number of engineering and development studies were active in the Reactor Section during August. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in documents HW-29137 and HW-29197. Several items of interest are reported below.

2. Plant Engineering (Continued)

A report covering the study of 100 Area boiler performance was under preparation during the month.

A study of optimum locations for Reactor Section machine shops has been completed and a report was issued recommending establishment of two central machine shops located in 100-B and H Areas.

A design study has been made of process tube cone screens. Results indicate that a cone fabricated from perforated plate will reduce plugging and hydraulic friction losses.

Revision of equipment and procedures for discharging process tubes during minimum scram recovery time has been completed and the revised method was successfully demonstrated.

F. Significant Reports

1. Routine

Monthly operating reports issued for July were:

HW-28906-A	Reactor Section	E. P. Lee	8-11-53
HW-28978	Operations Sub-Section	J. H. Warren	8-8-53
HW-28921	Process Sub-Section	R. O. Mehann	8-3-53
HW-28902	Plant Engineering Sub-Section	FAR Stainken	8-3-53
HW-28932	Radiation Monitoring Sub-Section	P. C. Jerman	8-4-53
--	Maintenance Sub-Section	E. E. Weyerts	8-5-53
--	Power Sub-Section	J. C. McLaughlin	8-4-53

Other routine reports issued during August were:

HW-28891	"Production Summary - July, 1953"	E. T. O'Sullivan	8-3-53
HW-29107	"Monthly Progress Report - Reactor Section Expansion - August, 1953)	H. T. Wells	8-24-53
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	FAR Stainken	8-21-53
HW-28933	"Reactor Section Radiation Monitoring Technical Report for July, 1953"	P. C. Jerman	8-4-53
--	"Annual Report - Landlord Properties - Reactor Section"	E. P. Lee	8-14-53

2. Non-Routine

HW-29152	"Special Study" (Study concerning irradiation of uranium to 150% of present goal.)	R. O. Mehann	8-28-53
HW-28957	"Metal Disc Scheduling"	J. H. Warren	8-28-53
--	"Power Costs FY 1953 as Compared with FY 1952"	J. C. McLaughlin	8-17-53
HW-28983	"Process Aspects of Reactor Operation with Increased Protection from Panellit Gauges"	R. O. Mehann	8-7-53

2. Non-Routine

HW-28982	"Increased Reactor Safety Through Panellit Gauge and Safety Circuit Revisions"	R. O. Mehann	8-10-53
HW-28609	"Production Test 105-4-MR, Suppl.A, Evaluation of Poison Column Control Facilities"	G. H. Dyer	8-10-53
HW-29083	"Poison Column Control Facility Production"	R. D. Schilling	8-21-53
HW-27670	"100 Area Process Water Pressure-Decay Test Program - Part III"	R. L. Turner	8-7-53
--	"Recommendation Report - Reactor Section Mechanical Shop Locations"	FAR Stainken	8-6-53
HW-28946	"Exposure Rates for Charging"	R. B. Hall	8-5-53
HW-29063	"Improvement of Reactor Production Nomenclature"	S. L. Nelson	8-17-53
HW-29059	"Six Months Post Acceptance Report, Project IR-101, Retention Basin Sumps - 100-B and 100-F Areas"	E. P. Lee	8-17-53
HW-29068	"Six months Post Acceptance Report, Project CG-420, CO_2 Bulk Storage Facilities, 105-B, F and D-DR Areas"	E. P. Lee	8-18-53

III. PERSONNEL

A. Organization

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

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	2	- 1
Operations	268	269	1
Maintenance	462	475	13
Plant Engineering	27	26	- 1
Power	419	414	- 5
Process	39	39	0
Radiation Monitoring	61	60	- 1
Section Total	1279	1285	6

Changes during August consisted of 6 terminations, 7 new hires, 3 de-activations, 2 reactivations, 2 transfers out and 8 transfers into the Section. The increase in Maintenance Sub-Section force indicated above was primarily due to procurement of personnel to perform unusual maintenance work.

C. Safety Experience

One Major Injury, No. 98, occurred in the Section during August. A machinist sustained a fractured finger at the Building 1717-F shop on August 12 when a plug was suddenly released from a tube by air pressure. Cause of the injury was attributed to improper use of compressed air. No Sub-Major Injuries occurred.

One Near-Serious Accident, No. 53-19, was investigated during the month. This incident involved exposure of three employees to chlorine gas at Building 183-D when a metal manifold connecting-tube was accidently broken on a 2,000 pound chlorine container.

D. Radiation Experience

There were no Class II Radiation Incidents during August. One Class I Incident occurred in the B Reactor discharge area because radioactive dummies were not detected in a process tube nozzle when the area was entered following a flushing operation. One employee received an estimated exposure of 100 mr to the body and 1000 mr to the hands. Investigation of this incident is contained in document HW-29072.

E. Personnel Activities

At month end, 20 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 15 of these are on assignment under the rotational training program.

In continuation of the special emphasis on employee communications, a number of informational meetings were held in the Section during August. Most significant were three meetings sponsored by the Process Sub-Section and four meetings sponsored by the Radiation Monitoring Sub-Section. Topics of the three former meetings were "Work of the Water Plant Development Group", "Work of the Pile Coolant Studies Group", and "A Review of Report Writing from the Process Sub-Section Aspect". A series of films on radiation and radioactivity, prepared by the Armed Forces, was shown in each of the other four meetings. A total of approximately 200 employees attended these meetings as appropriate to their work.

D. N. Mathis visited the Bingham Pump Company in Portland, Oregon, on August 29 to observe tests of prototype process pumps for 100-K Area.

Richland, Washington
September 10, 1953

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
AUGUST, 1953

I. RESPONSIBILITY

Responsibilities of the Separations Section were essentially unchanged during the month of August.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	August		July	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	21	1	20	1
Charges completed in Conc. Bldgs.	18	1	20	0
Special charges - Conc. Bldgs.	25		40	
Charges completed-Isolation Bldg.	160	1	263	0
Average Waste Losses, %	2.4		2.3	
Special charges-Isolation Bldg.	55		41	
Material balance, %	101.2		99.8	
Yield through Process, %	98.8		97.6	
Average cooling time (days)	68		53	
Minimum cooling time (days)	59		45	

b. Redox Operations

	August	July
Equivalent charges started	174.2	205.2
Charges completed	157.7	221.1
Tons Uranium delivered to storage	125.1	157.6
Average Production Rate per operating day, Tons	5.7	6.0
Average Daily Operating Rate for the month, Tons	4.0	5.1
Average yield, %		
Uranium	100.0	97.7
Plutonium	99.95	99.0
Total Waste Loss, %		
Uranium	1.21	1.23
Plutonium	1.22	1.26
Average cooling time, days	79	73
Minimum cooling time, days	63	69
Percent down time	29	16

c. 234-5 Operations

	August	July
Batches completed through Task II	274	239
Runs completed through Task III	230	220
Reduction yield, RM	94.0	95.5
Waste Disposal, units	3.06	5.7

d. UO_3 Operations

	August	July	To Date
Uranium drummed, Tons	298	388	3311
Uranium shipped, Tons	263	395	3241
Average cooling time, days (Redox)	99	80	
Minimum cooling time, days (Redox)	83	76	
Waste Loss, %	0.1	0.06	

e. TBP Operations

	August	July	To Date
Tons received from Metal Removal	173	223	1843
Tons shipped to UO_3 Plant	166	212	1748
Average Production Rate per operating day, Tons	6.18	7.67	
Average Daily Operating Rate for the month, Tons	5.35	6.83	

e. TBP Operations (Continued)

	August	July
Average yield, %	95.91	94.73
Total Waste Loss, %	4.09	4.43
Ratio Waste Volume returned to Volume removed	1.31	1.22
Percent Down Time	13.5	11

f. Power

	200 East	200 West
Raw water pumped, gpm	1 743	7 562
Filtered water pumped, gpm	513	1 080
Steam generated, lbs/hr	21 477	142 013
Maximum steam generated, lbs/hr	50 000	216 000
Total steam generated, M lbs.	15 979	105 658
Coal consumed, tons (est.)	1 054	7 071

g. Waste Storage

	Equivalent Tons U
Metal Waste reserve storage capacity - T Plant	333*
1st Cycle reserve storage capacity - T Plant	308
Metal Waste reserve storage capacity - B Plant	145
1st Cycle reserve storage capacity - B Plant	4
Redox Waste reserve storage capacity	523

*Increase caused by adding 102-U and 103-U tanks to metal waste reserve.

2. Activities

a. Redox Processing

The Redox Plant operated at an average rate of 4.0 tons per day at 86% efficiency. Processing was started on August 8 at 4 tons/day rate after the extended maintenance shutdown which began on July 28. Poor uranium decontamination after start-up made it necessary to rework through the uranium cycles ca. 5.5 tons of high gamma uranium product and to transfer ca. 41.5 tons to the TBP Plant for further decontamination. The feed rate was 5 tons/day during the rework period, and was increased to 6 tons/day on August 18 when rework was completed. The rate was raised to 7 tons/day on August 24, and this rate was essentially maintained for the balance of the month.

b. TBP Processing

The TBP Plant operated at an average rate of 5.4 tons per day at

b. TBP Processing (Continued)

69% efficiency. Feed rates to both lines varied between 3.0 and 6.0 tons per day with RA Column waste losses averaging 2.6%. The production commitment was not attained due principally to poor decontamination of the test feed material from 101-BX (2.5 years decayed) with resultant rework, and the necessity for processing ca. 41.5 tons of Redox high gamma uranium product. A build-up of metallic impurities in the uranium product coupled with poor decontamination and high waste losses dictated shut-downs on August 18 and August 27 for extensive column and vessel flushes.

c. UO_3 Processing

Plant operations were essentially normal, but it was necessary to process at low rates during the first half of August when the Redox and TBP Plants could not supply sufficient feed for high rates.

d. Waste Metal Removal

An adequate supply of feed was provided the TBP Plant by the tank farms with metal removal operations actually being curtailed, on occasion, due to low processing rates in TBP. Cleanouts of Tanks 102-U, 103-U, and 103-C were completed during the month.

Tank 103-TY was filled with TBP wastes during the month, and tanks 102-C and 104-TY are currently receiving these wastes.

e. T Plant Processing

T Plant production was increased when it became apparent that operational difficulties would preclude Redox attaining forecast production.

Operations were essentially normal in both the Canyon and Concentration Buildings, and one acid wash was processed with a total pickup of 28.9% of a standard run.

f. 234-5 Processing

The August commitment of final shapes was processed in the 234-5 Building RMA Line and delivered to the AEC. The coating rejection rate continued to be high, but recent correction of minute leaks in coating hood gas lines appears to reduce the incidence of "whiskers" forming on the planer surface, and should reduce the rejection rate of coated pieces.

3. Special Operations

a. Waste Evaporation

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

a. Waste Evaporation (Continued)

Evaporator	Gallons Feed	Gallons Bottoms	Gallons Condensate	% Volume Reduction
242-T	522 237	245 306	276 931	53
242-B	0	0	0	0

The 242-B waste evaporator was shut down the entire month for maintenance work. Feed for 242-T was high volume TBP wastes from Tanks 107-T, 108-T and 109-T.

b. Pu Recovery - 234-5

The equivalent of 29.8 bottles of product was processed in metal recovery during August, and the equivalent of 32.1 bottles of product was transferred to the Concentration and Isolation Buildings for reprocessing.

All metal reduction particles and buttons stored as inactive material were recovered, completing this portion of the inactive account.

c. Silver Reactor Shipment

A silver reactor column from T Plant was cleaned, crated, and shipped to Oak Ridge on August 26 for recovery of I^{129}.

4. Schedule Variance

Redox plutonium and uranium production were both low with 94% and 93% of the amount forecasted.

T Plant production was 58% of the July forecast. It had been scheduled for 32% at the beginning of August due to the excellent performance of Redox in July. When operational difficulties developed in Redox during August the T Plant rate was increased. The combined plutonium production of the two plants was 89% of the July forecast.

Poor decontamination performance with subsequent rework, and the need for processing high gamma Redox uranium product resulted in the TBP Plant attaining only 69% of forecast.

The UO_3 Plant produced only 90% of forecast due to a shortage of feed from Redox and TBP Plant.

B. Equipment Experience

1. Operating Continuity

Essentially all of the Redox down time of 215 hours was a result of

1. Operating Continuity (Continued)

difficulties associated with installation of the replacement centrifuge, loss of several H cell jumpers and attempted but unsuccessful revision of the H-1, H-3 venting systems.

The A Line in TBP was down 79 hours due primarily to the need for line and vessel flushing to improve operating performance.

The B Line down time of 122 hours can also be attributed to the need for flushes.

2. Inspection, Maintenance and Replacement

a. Redox Centrifuge

Installation of the spare H-2 centrifuge was completed on August 2, but equipment check-out indicated the plows to be impinging on the baffles. Following removal for plow adjustment, centrifuge re-installation was completed on August 6, 1953.

b. Oxidizer Pot Coil - Redox

On August 21, the cause for high radiation readings at the Redox retention basin (207-S) was traced to failure of the oxidizer (H-4) pot coil. Normal operation was continued by keeping the coil pressurized, but complete failure of the unit on August 28 necessitated blanking the coil inlet and adoption of a cold oxidation procedure. A new H-4 pot is being fabricated in the maintenance shops for installation in September.

c. 1-A Column Feed Jumper - Redox

The feed jumper to the 1-A Column was replaced on August 13 because of a stuck valve and leaking rotameter flange.

d. 1-S Column Feed Pump - Redox

The feed pump to the 1-S Column failed on August 14 due to a sheared shaft. A jumper was installed which connected the 1-S and 1-A feed valves, and has allowed both columns to be supplied by the 1-A feed pump at a 7 tons per day rate.

e. Booster Pumps - Waste Metal Removal

The booster pumps between 244-TXR and 241-B began to leak badly at the packing glands. Installation of by-pass jumpers has allowed operations to continue until maintenance can be effected.

f. 101-B Heel Jet - Waste Metal Removal

Difficulty experienced with the 101-B heel jet was eliminated by replacing a faulty gang valve and regasketting the process air line.

2. Inspection, Maintenance and Replacement (Continued)

g. UR Vault Ventilation Fans - Waste Metal Removal

The north and south ventilating fans for the 244-UR vault failed during the month and were replaced with spare units. This makes a total of four such failures and is apparently due to nitric acid corrosion.

h. Waste Evaporator - 242-B

All four evaporator steam coils were replaced, and the leaking condensate line to the retention basin was repaired. Replacement of the fill line to Tank 106-B was completed on August 31. Evaporation of TBP wastes will commence in September.

i. 291-U Fan Motor - TBP

The number one fan motor (60 HP) at 291-U burned out on August 9 due to continued overloading. Since a motor with a higher horsepower rating was not available, replacement was effected with a spare motor of the same rating.

j. Filter Bag Replacements - UO_3

The X-3 primary filter bag was replaced twice, and twelve filter bags were replaced in the X-11-1 and X-11-2 secondary filters. Felt deterioration from increased quantities of oxides of nitrogen is believed to be the cause for the high incidence of secondary filter bag failures. Opening a by-pass valve at the nitric acid absorption tower bleacher has reduced the quantity of NO_2 escaping to the filters and should minimize this problem.

k. Primary Concentrator Feed Pump - UO_3

The PX-3, primary concentrator feed pump, was replaced after the bearings failed and the shaft was scored. The defective pump will be repaired and held as a spare.

l. Conveyor Hood Equipment - 234-5

The conveyor hood equipment used for moving material between dry chemistry and reduction failed, necessitating fabrication and replacement of some parts. The equipment is currently being operated semi-remotely to prevent damage to boats and elevator, and replacement parts are being fabricated to complete the necessary repairs.

C. Improvement Experience

1. Process Tests and Revisions

a. Oxidizer Batch Size Increase - Redox

On August 14, the oxidizer batch size was increased from 1600 to

a. Oxidizer Batch Size Increase - Redox (Continued)

1700 gallons permitting a production rate of approximately 7.25 T/D with the present oxidation procedure. Operation with the larger batch size has proceeded satisfactorily with no indications of excessive entrainment.

b. Semi-Continuous Dissolving - Redox

Use of the semi-continuous dissolving procedure was discontinued on August 13 to permit evaluation of its effect on extraction cycle decontamination. Comparison of second uranium cycle product stream (2EU) activity with the proportion of metal dissolved by means of the semi-continuous procedure revealed that, except for a two day period at the start, 2EU activities were higher than anticipated. Preliminary laboratory data indicate that lower Zr-Nb decontamination factors are obtained with semi-continuous dissolved material than with batch dissolved feed, and further plant tests are planned to determine the reasons for the apparent adverse effect on decontamination.

c. Waste Evaporator Batch Size - 242-T

Waste evaporator batch volumes have been increased by 32% since the foaming problem was brought under control by addition of an antifoam agent. The larger batch volume decreases the number of times an evaporator must be emptied (2 hrs. per dumping), and hence increases the time available for evaporation.

d. Self Concentration of Stored Wastes - Redox

The recently installed condensers on the 101-S and 104-S Tanks were placed in service on August 19. A high tank pressure in 104-S contributed to producing an initial condensate rate of 2.5 to 3 gallons per minute, but when equilibrium conditions were reached the rate leveled at about one gallon per minute. Tank 101-S is not boiling as yet.

e. Test Processing of 101-BX Material - TBP Plant B Line

The first three batches of uranium product produced from the 101-BX feed (2.5 years minimum cooling) were within the beta and gamma specification, but the remaining eight batches averaged significantly higher than the specification and required rework through A Line. The test demonstrated conclusively that series operation and, possibly, better solvent cleaning method is required for processing metal wastes decayed to less than 3-1/2 to 4 years.

f. Reduction of Casting Operation Anneal Period - 234-5

Fifty-six all button castings have been made with no hold period at the annealing temperature; eight had a high density, one had a void and one had pits on the primary. Statistical data show that the high density rejects are being caused by poor 70-58 distribution rather than the furnace cycle.

C. Improvement Experience (Continued)

2. Inventions or Discoveries

There were no inventions or discoveries of a patentable nature reported during the Month.

D. Events Influencing Costs

1. Labor Variance

Total force of the Separations Section dropped by four, due to terminations and transfers.

2. Material Variance

a. Self Concentration of Stored Wastes - Redox

Reduction of stored waste volume at a rate of nearly 1300 gallons per day through self concentration results in a daily savings of about $415 in capital investment, based on waste storage costs of 32 cents per gallon.

b. Process Chemicals - T Plant

The chemical addition chart for 221-T Building runs has been recalculated to give closer control of chemicals added to the process vessels with a resultant chemicals cost savings approximately $19 per run.

c. Increased Efficiency - 242-T Waste Evaporator

The evaporation rate at the 242-T Waste Evaporator has been increased 5% by processing larger batches of waste.

3. Other

a. Elimination and Reduction of Analytical Determinations

A laboratory survey of analytical requirements for the various processes, and subsequent agreement by operating personnel to elimination or reduction of certain determinations has resulted in an estimated annual savings of $6,000.

E. Plant Development and Expansion

1. Project Status

Rehabilitation of the metal line in the P-10 Facility is complete except for final leak checking. The alternate system for activation of Toepler pumps has been installed in parallel with the helium recycle system. Monitoring tests performed in August indicate that the radiation level for P-10 slugs prepared from Savannah River material will

1. Project Status (Continued)

be about 20 times higher than originally anticipated. As a result, a revised Project Proposal is being prepared which requests funds for additional shielding particularly in the can opening hood.

The self-concentrating condenser on Tank 104-S was placed in operation on August 19, and is satisfactorily reducing the 104-S waste volume at the rate of one gallon per minute.

Work has been scoped and detailed design has been initiated by the Design Section for modification of the TBP Plant for series operation.

Based on recently discovered inadequacies in the Redox canyon ventilation, the Engineering Department has been requested to revise the Purex ventilation design to overcome Purex design inadequacies. The requested design changes are to insure that thermal currents from open cells are minimized and that the air above the canyon deck does not return to the canyon roof, thereby minimizing crane contamination. The problem in Redox is being studies and equipment being prepared for evaluation of the ventilation conditions.

Construction of the Redox waste line to U Farm is ahead of schedule, and the 241-SX Tank Farm is on schedule.

Design of the Redox underground-seepage basin is actively proceeding; soil percolation tests were completed with satisfactory results.

2. Plant Engineering

A system was established for the routine reporting of actual costs versus standard costs at Separations Section cost centers. This system, which is necessarily in more detail than that submitted to the Department Manager, is designed to permit effective local control of costs under the standards system. Eight major cost centers within the Section, conforming to present cost-accounting practices, are being utilized and a total of 250 standards have been established, covering all Separations costs. Approximately 90 of the standards have been engineered and the remainder have been based on historical average costs.

A program of augmenting Separations Section cost-reduction efforts by enlistment of a greater number of employees in this work is being actively pursued by the Separations Section Work Simplification Council, which is composed of the Sub-Section Superintendents. Decision was reached during the month to establish on a trial basis in the Z Plant a work-simplification "round table" of the type which has been exceedingly successful in the parent company. It is hoped that this "round table" can be initiated in late fall. A Section-wide program for enlisting more active support of all non-exempt personnel in the development of cost-reduction suggestions is being developed.

F. Significant Reports Issued

1. Routine

Number	Title	Author
HW-29199	Separations Section - Operations Monthly Report	V. R. Chapman
HW-29198	Separations Section - 234-5 Operations Monthly Report	V. R. Chapman
HW-29168	Separations Section - Process Monthly Report	W. N. Mobley
HW-29214	Separations Section - Radiation Monitoring Monthly Report	A. R. Keene
Restricted	Separations Section - Power and Maintenance Monthly Report	R. T. Jessen
HW-29188	Separations Section - P-10 Extraction Unit Monthly Report	O. V. Smiset
HW-29025	Separations Process Committee Minutes	O. F. Beaulieu
HW-29258	Separations Section - Plant Engineering Monthly Report	C. P. Cabell
HW-29240	Essential Materials - Operations Sub-Section Separations Section	J. P. McBride
HW-29161	Monthly Progress Report, Plant Expansion, Plant Engineering Sub-Section, Separations Section, August, 1953	F. A. Hollenbach

2. Non-Routine

HW-28668	SF Materials Accountability Procedure for 200 Areas, Process Sub-Section, Analytical Unit	L. M. Knights
HW-28952	"N" and "P-10-A" Slug Handling	O. V. Smiset
HW-29026	Basic Information for Labor and Material Standards, 234-5 Analytical Unit, P.E. Report No. 79	J. E. Fouts
HW-28973	Basic Information for Steam Standards, 221-T, 224-T, P.E. Report No. 80	R. S. Himmelright
HW-28974	Basic Information for Steam Standards, 234-5, 231, P.E. Report No. 81	R. S. Himmelright

2. Non-Routine (Continued)

Number	Title	Author
P.E. Rpt. 82	Cost Report for 234-5 Operation	W. A. Brown
P.E. Rpt. 83	Coal Weighing Using Strain Gages	R. C. Burke
HW-29133	Radiation Incident, Class I, No. 78	J. P. Corley
HW-28677	Voids in Lead-Lined Doorstops of Redox Facility	J. J. Jech
HW-29054	Waste Status Summary - Separations Section	J. P. McBride

III. PERSONNEL

A. Organization

There were no organizational changes in the Separations Section during the month of August.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	5	5	0
Operations Sub-Section	608	597	-11
Power and Maintenance Sub-Section	571	569	-2
Process Sub-Section	198	200	2
Radiation Monitoring Sub-Section	73	73	0
Plant Engineering Sub-Section	31	30	-1
P-10 Extraction Unit	17	25	8
Section Total	1503	1499	-4

C. Safety Experience

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

Preparations were completed for the 1953 Separations Safety Stampede with the kickoff date set for September 1.

D. Radiation Experience

One Class I Radiation Incident (#78) occurred in August and involved exceeding of batch size in 224-T.

In the Redox Plant, a large number of ruthenium-carrying crystals of ammonium nitrate were again emitted from the stack. More frequent flushing

D. Radiation Experience (Continued)

of the stack is expected to greatly reduce emission of these large crystals. A leaking oxidizer pot coil (H-4) resulted in discharge of additional radioactive material to the Redox swamp (207-S). When this discharge became excessive, the pot coil was blanked off, thereby preventing further contamination of the utility outlet header, retention basin, and swamp.

Progress was made on decontamination of the Redox south sample gallery. Extensive decontamination efforts on the crane bridge and crane maintenance platform were ineffective because of prompt recontamination resulting from necessary crane work in the process cells. Until the cell ventilation system can be improved, contamination of the crane will continue to be a problem.

E. Personnel Activities

1. Non-Exempt Information Meetings

The fourth and fifth of the scheduled series of non-exempt information meetings were held in August with a total attendance of 250.

2. G.E. Supervisory Selection Program

Evaluation of six Power Unit personnel was completed during the month, and evaluation of candidates from Radiation Monitoring and Operations Sub-Sections is currently in progress.

3. Conference Leading Training

On August 28, fourteen Separations Section personnel completed the Conference Leading training course conducted by Training and Development personnel.

4. Laboratory Technical Personnel

Four lecture courses were held during the month with a total attendance of 106.

5. Emergency-Disaster Training

Twenty-one Separations Section personnel received the basic rescue training course in August. Training in emergency-disaster procedures will continue through October.

6. Report Writing Course

A course in report writing was presented to ten Separations Section personnel on August 11 and 12 as a "trial run". A revised course

6. Report Writing Course (Continued)

more directly applicable to Separations Section needs is planned for future meetings. The course is conducted by A. H. Frietzsche of Technical Information.

7. Visitations

P. R. McMurray visited Los Alamos on August 17 to discuss vacuum tank design and tritium production.

W. N. Mobley spent August 13 and 14 with representatives of Dow Chemical Company at Rocky Flats, Colorado discussing the metal fabrication process.

ENGINEERING DEPARTMENT

AUGUST 1953

TECHNICAL SECTION

The Redox plant was shut down from July 29 to August 8 for replacement of H-2 centrifuge, flushes of the extraction columns and other maintenance requirements. Operation for the remainder of the month was with $KMnO_4$ Head-End oxidation of 1AF, three uranium cycles and three plutonium cycles. Process performance during the month was characterized by low but improving uranium decontamination and normal plutonium decontamination. With the exception of short periods, uranium and plutonium losses were normal. For most of the month a production rate of 240 percent of the instantaneous design rate was maintained with a rate of 280 percent attained on August 24.

Uranium processed through solvent extraction in the Metal Recovery Plant was 82 percent of the nominal design capacity. Total input included 21 percent Redox rework and 6 percent rework from 221-U and 224-U Buildings. Processing included a production test on B-Line of 10.6 tons of uranium feed prepared from Tk-101-HK with a minimum age of about 2.5 years. This "young" feed was processed at 100 percent of the nominal design rate and two-cycle operation was necessary to obtain the required fission product decontamination. Calcination operations produced also 82 percent of uranium processing design capacity, limited chiefly by lack of feed. Average metallic impurities of the UO_3 produced increased to 282 parts per million parts of uranium from the 188 attained in July. Most of this increase was attributed to the reduced fraction of Redox-source feed, 24 percent.

Twenty-five Purex-process test runs with cold uranium in a full-scale, 24-inch, prototype HA column and associated HC column have culminated in the development of an effective phase redistributing device greatly improving the performance of the HA column and permitting the attainment of losses less than 0.1 percent under flowsheet conditions at rates ranging from 3 to 15 tons/day. Losses without the redistributer ranged typically from 0.14 to 15 percent.

Redox flowsheets tested in Hot Semiworks runs included permanganate volatilization of ruthenium followed by total dissolution of MnO_2 with chromic nitrate, wash flowsheets in the 1A and 2D columns, passage of hexone-saturated 2EU through silica gel, and a reflux 2A-2B column system.

The use of low density graphite in the core in piles of K design has been under investigation as a means of reducing graphite costs, eliminating reactivity gain on loss of cooling water, and increasing conversion rate. Enrichment would presumably be needed. In this connection a detailed calculation has been made of the hot k of a K Pile operating at a graphite temperature of 500° C and a nominal power level of 1300 MW, using present graphite. The flat zone radius was found to be equivalent to only 350 flat tubes. Thus use of enrichment would be singularly profitable in the K Pile even using regular graphite, and is not a unique requirement of the low density graphite proposal.

For some time a discrepancy has existed between the values of fast neutrons produced per thermal neutron absorbed in natural uranium obtained by direct combination of cross sections, and by exponential pile measurements. This discrepancy has been shown to derive from a shift of the thermal neutron energy spectrum to higher energies as the neutrons move into the interior of a uranium slug. A value of 1.34 ± 0.02 computed from cross sections is reduced by 3.2% by applying this correction to the slug in a Hanford 7½ lattice, yielding agreement within experimental error with the exponential pile value of 1.296.

A new method has been devised for calculating the inverse diffusion length of thermal neutrons in uranium. This method is a modification of the Serber-Wilson technique for solving problems in transport theory. The calculated result for slugs loaded in the Hanford 7½ inch lattice was in agreement with experimental foil measurements of the thermal flux distribution within the slug. The method will be applied to calculations of the effect of enrichment, slug size and lattice size on lattice properties.

A preliminary design and a cost estimate of a fuel element testing facility to be installed in the Materials Testing Reactor have been submitted. This facility will allow irradiation of Hanford size fuel elements at power levels up to at least 60 kw/foot with more careful observation and with greater safety than is obtainable in a Hanford reactor. The special irradiations which are contemplated for such a facility would include: Testing of new fuel element designs, operation of metal slugs at higher specific powers and total exposures and at elevated core temperatures, and the testing of slugs known to possess certain defects.

The metallographic study of uranium metal slugs which had been thermally cycled simulating the thermal environments of an operating pile at high power levels has been completed. Confirming preliminary observations reported last month, no induced orientation effects or voids were found in core regions where the transformation temperature had been exceeded. In addition, the transition zone surrounding the core was found to have a grain size smaller than is normally observed in beta heat treated uranium.

The first Hanford data on the several phase transformation temperatures of pure plutonium metal have been obtained. Results obtained are in substantial agreement with Los Alamos data except for the melting point temperature.

In the course of ultrasonic testing of 47,000 slugs which were made at Fernald from beta heat-treated uranium rods for lead-dip canning, 137 slugs were rejected. Study of these rejects established that 40 were partially transformed. The evidence indicates that the incomplete transformation was due to insufficient submersion of the rods in the heat treating salt bath. The remaining 97 reject slugs were found to be completely transformed but had been rejected because they had a smaller grain size than that typical of beta transformed uranium. Unusually large amounts of iron, silicon and aluminum

are believed to be the cause of the smaller grain size in these slugs.

Poor bonds between the cap and can wall required rejection of approximately 40 percent of some 200 "J" type slugs canned with an Al-Si brazed cap. The defect is observed as an unacceptable void in the braze at the faced surface and is presumed to be due to entrapped air which lodges at the side of the cap. The total yield, 50 percent for these 200, is expected to increase to 60-65 percent for an additional 54 pieces yet in process. Further improvement is expected. Of approximately 200 slugs previously canned by this method, this defect was observed in 7 to 8 percent of the pieces.

Lead-dip canning of about 55,000 eight-inch slugs was completed. Canning yield improved during the three week trial use of the process from 76 percent for the first week, to 84 for the second and 91 for the third. Canning yield during triple-dip production prior to the test was approximately 78 percent. Objectionable porosity (voids) in the Al-Si bonding layer of the lead-dipped slugs is more characteristic of the lead-dip process than of triple dip and was generally detected in poor bond and frost test rejected pieces. The percentage of slugs rejected due to porosity decreased during the test run, averaging approximately four percent for the last week. Investigation is proceeding to improve the process in this regard.

An evaluation of uniformity and quality of machine canned slugs is in process using 300 machine canned pieces and for comparison, 300 manually canned pieces. The use of a shallow groove roller-cut in the outside can wall surface near the open end is successfully preventing Al-Si "slop-overs."

Approximately 950 tru-line slugs were canned by the lead-dip process with a satisfactory yield of 78 percent. Twenty-four tubes were charged with tru-line slugs at C Pile, August 10, bringing the total of tubes charged to 28.

Three uranium ruptures occurred during the month. Two of these were group 8 metal, and one was a 63-S jacketed four-inch production test piece. There have been no C Pile ruptures since June.

Based on examination of E slugs exposed at specific powers of 60 KW/ft. for 600 MWD, tube power levels at C were increased 100 MW/tube, including the hot spot region. This change has resulted in a new high power level at that reactor.

Favorable oxidation rates of graphite samples exposed to pile gas at 500° C have led to consideration of process specification revision of the graphite limit in the near future.

DESIGN SECTION

During the month direct engineering effort for the Section was distributed approximately 67% to Expansion Program activities, 21% to research and development studies and 12% to other projects and design orders.

Over-all design progress for the 100-K reactors advanced to approximately 96% completion, an increase of .9% during the month. Progress for August is based on approximately 1920 drawings, whereas previous monthly reports reflected progress based on approximately 1850 drawings. A total of 1839 drawings have been approved to date including 102 drawings approved during August. The estimated Design Section expenditure for CA-512-R has been reduced to $2,350,000. This is a reduction of $431,500 from the current authorized funds. Total Design Section expenditures to date are $1,717,900.

Design activity for the 200 Area Expansion Program was concentrated on the Purex Waste Facility. Detailed design for this facility is now approximately 75% complete, an advance of 25% during the month. Design of the Purex Outside Facilities was advanced to 94% completion and design of the Metal Conversion Plant Expansion was advanced to 98% completion.

Design for the 300 Area Expansion Program was advanced to 61% complete, an increase of 9% during the month. Activity continued to be centered on the 313 Building process equipment.

Design work on Project CG-551, Expansion of Building 234-5 Facilities, was advanced 7.3% during the month to 30% completion. Twenty-three drawings of a required 237 have been approved to date. Purchase requisitions and specifications issued for procurement of critical material and equipment now total $18,300.

The preparation of design scope for Reactor Plant Modifications for Increased Production continued under research and development authorization. Funds for the initiation of design as a project have been authorized by the AEC (CG-558) and limited project design will start in September.

Progress for Reactivation of P-10 Facilities, Project CG-550, was limited during the month because of a major change in design scope involving increased shielding requirements. Design advanced 2% to 67% completion. Progress includes the scope change which required the equivalent of 22 drawings.

Over-all design of the Recuplex Installation, Project CG-496, is approximately 97% complete, an advance of 2% during the month. The remaining work includes the design of chemical storage facilities.

Design on an emergency basis was started on revisions to TBP Plant for two-cycle series operation and is approximately 5% complete. Preliminary design is being done to investigate the need and establish the economic justification for additional TBP Plant changes to obtain greater capacity, improved yield, and improved decontamination.

All elements of the fuel element canning machine prototype, including the furnace, have been received. Cold runs are scheduled to start about September 1, 1953, and full-scale testing of the prototype will start about September 15, 1953.

PROJECT SECTION

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox, 3%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.8%; CG-438, Ball Third Safety System, over-all, 96.5%; CG-496, Recuplex, 20%; CA-506, Repairs to 100 Areas Retention Basins, 100%; CA-512, 100-K Area Facilities - Water Plants, KW, 27.3%, KE, 21.2%, Reactor Buildings, 105-KW, 24.24%, 105-KE, 12.98%; CA-513, Purex Facility, Part "A," 8.8%, Part "B," 47%, Part "C," 99.9%; CA-514, 300 Area Expansion, over-all, 11%.

The work load for Inspection at vendors' plants increased substantially during August. At the close of the month, there were 241 open requisitions for items which will require inspection. The larger orders for 100-K Reactor and for the Purex Facilities are starting in production. Vendors of shielding blocks for the 100-K Reactor are gradually reaching full production; however, the vendor for base blocks has not as yet produced acceptable blocks. The magnetite ore for concrete shielding has been delivered, but acceptable limonite ore has not yet been received. It now appears that difficulties with gun barrel tubing and horizontal safety rods are increasing.

Several strikes in vendors' plants threaten construction schedules at Hanford. Among these are strikes at Chapman Valve Company, affecting 100-K construction, the G. E. X-Ray Plant which is providing the Maxitron for Project CA-192, Biology Laboratory, and the vendor for Recuplex vessels.

Work completed by Minor Construction during the month consisted of four projects and two engineering requests; the completed projects were the Aquatic Biology Laboratory, Pile and Pile Water Plant Improvements, Repairs to the 100 Areas Retention Basins, and Painting 105-B, D, and F High Tanks. Some further work on Retention Basin Repairs remains, but it is being handled as an exception. Painting of the high tanks was accomplished by Minor Construction for about $25,000, an underrun of about $17,000.

Main elements of the Hanford Laboratory are approaching completion. Only three major projects, Radiochemistry Building, Pile Technology Building, and Mechanical Development Building, remain unfinished. Outside facilities and utilities are 99% complete.

Construction of 100-K Waterworks is progressing on all major parts. The cumulative total of concrete placed was KW, 59,556 yds.; KE, 45,408 yds.; general facilities, 7,199. Structural work for 190 and 165 Buildings indicates that an accelerated construction schedule will be required. The 105-KW structural work was nearly completed; so work was confined to the storage and transfer area and the 115 Building. The sub-contractor's work was completed on the 300-foot ventilation stack, and he has begun construction of the 105-KE stack. Installation of mechanical equipment continued in both 105-KW and 105-KE. The first tier of crates for 105-KW was installed and accepted.

Production of graphite on the Sundstrand machines has approached their capacity of 60 to 70 blocks per hour. The milling operations began August 10, on a two-shift basis.

Over-all design of the Purex facility was 73% complete, and over-all construction was 9.98% complete. The foundation mat for Building 202-A was completed August 7, and the second lift of the south canyon wall was started on August 25, 1953. The 18" steam distribution line from the 284-E Boiler House to the Purex plant and the 24" raw water distribution lines were completed and accepted.

Construction of Part II, Redox Production Plant, began August 3, and progressed to 3% complete. A solution to the problem of sample gallery ventilation was 20% accomplished.

Construction on Part "B," UO_3 Expansion, was suspended on August 10, for lack of equipment and material, but modification of kettles has continued in the Minor Construction shop.

Construction on Redox Capacity Increase - Phase II was 8% complete.

ORGANIZATION & PERSONNEL

Total on Roll, August 1, 1953	1,569
Accessions	36
Separations	34
Total on Roll, August 31, 1953	1,571

A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

[redacted]

ENGINEERING ADMINISTRATION SUB-SECTION

AUGUST 1953

During the month, copies of the first draft of HW-28965, entitled "Readying Papers for Publication," were sent to interested departments for review. The document is intended to brief Hanford authors on the procedures to be followed in preparing and clearing papers intended for publication in scientific journals and trade magazines. A broad preliminary review of the document is planned, to make certain that the facts in it are correct, and that a majority of the questions likely to arise are answered. Initial response has been enthusiastic and indicates a real need for a document answering the numerous questions which arise in this connection.

During the month the following major contract activities were handled:

During July the Commission was requested to modify a directive covering production of a training film to more nearly agree with the contemplated production of the film, and also to allow the negotiation of a contract with a single film processing company rather than advertising for bids. As of August 31, the Commission had not answered General Electric's letter or modified the directive, but has verbally advised General Electric that the directive will stand and the contract must be advertised for bid rather than negotiated. The necessary invitation and specifications are being developed, and it is hoped same will be issued during September.

Special Agreement No. G-32 between General Electric and Teaching Film Custodians, Inc. covering the rental of short movie subjects for the Safety & Fire Protection Unit has been executed by General Electric and sent to the Lessor for signature.

At the request of the Commission, a proposal was solicited from General Telephone Directory Company for the printing of the official telephone directory in connection with the Richland telephone directory. After study of the proposal received from the contractor, the Commission approved our recommendation that only the work of printing the Richland directory be let to the contractor, the printing of the official directory to be done by General Electric. A contract (Special Agreement No. G-26) has been prepared for execution by General Electric to cover the printing, assembling and delivery of the Richland telephone directory by General Telephone Directory Company.

Special Agreement No. G-30 between General Electric and Charles Bruning, Inc. covering the quarterly servicing of Whiteprinting reproduction equipment was executed by Charles Bruning, Inc., August 31, and is being transmitted to AEC for approval.

Special Agreement No. G-31 between General Electric and Abadan-Spokane covering the quarterly servicing of Ozalid equipment has been executed by General Electric and was transmitted to Abadan-Spokane, August 3.

Consultant Agreement No. 109 between General Electric and George W. Watt covering consultant services, was terminated by Dr. Watt in accordance with the terms of that agreement. Consultant Agreement No. 116 was written to replace the old agreement No. 109, providing for the same type of services but requiring less time to be expended by the Consultant. The new agreement was executed by General Electric and the Consultant and sent to AEC for approval, August 27.

Modification No. 4 to Special Agreement No. G-21 between General Electric and Bird Machine Company covering an extension of time to the agreement for redesign and modification of a centrifuge, was drafted during August and is in the process of execution.

[redacted]

[redacted]

HW-29229

PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

AUGUST, 1953

[redacted]

Fb-1

1205804

DECLASSIFIED

ile Technology Sub-Section

VISITORS AND BUSINESS TRIPS

E. E. Baldwin visited here August 3 through 7, from Knolls Atomic Power Laboratory, Schenectady, New York, for consultations on boron carbide engineering irradiation - KAPL-114.

V. C. Hamister and R. L. Mansfield visited here from National Carbon Company, Cleveland, Ohio, August 25 through 28, to inspect shipments of National Carbon graphites received on site and to discuss technical aspects of machining these bars.

P. Powell and M. P. Warren visited here from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, July 27 through August 10, for consultations on the Neutrino Program.

R. C. Lovington and G. E. Wade visited Phillips Petroleum Company, Arco, Idaho, August 10 through 12, for contact engineering at the Materials Testing Reactor regarding design of test facility being developed by Mechanical Development.

D. E. Stephens attended the IRE Western Electronics Show and Convention in San Francisco, California, on August 18.

R. W. Thiele visited Los Alamos Scientific Laboratory, Los Alamos, New Mexico, August 31 and September 1, to discuss neutron spectrum measurements.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	July	August
Administrative	4	4
Pile Engineering	82	83
Pile Materials	65	65
Special Irradiations	24	24
Total	175	176

Pile Engineering: Two Engineers transferred in from Fuel Technology Sub-Section, one Group Head transferred in from Technical Administration Unit, and two Junior Engineers terminated to return to school.

Pile Materials: One Engineering Assistant transferred in from Applied Research Sub-Section, one Engineering Assistant transferred in from Manufacturing-Separations-Process, one Junior Engineer transferred to Separations Technology Sub-Section, and one Engineering Assistant terminated to return to school.

Special Irradiations: One Engineer transferred in from Laboratory Engineering and Facilities Unit, and one Junior Engineer terminated to return to school.

Pile Technology Sub-Section

PROCESS TECHNOLOGY

Power Level Limits

Power levels were limited by vapor binding, outlet temperature, and graphite limits during the month of August, except at C and D Piles. The fixed maximum power per tube at C Pile was increased approximately 15 per cent during the month. D Pile operated under production test conditions and was limited by tube outlet water temperatures. B and F Piles were limited by vapor binding or corrosion limits, DR by maximum tube limits for the DR-10 Program, and H by graphite temperature limits, even with 30 per cent helium addition.

Slug Rupture Experience for August

Three uranium slug ruptures occurred during the month. Two of these were Group 8 Metal failures; a cap failure in the central orifice zone at D Pile and a uranium cleavage failure in the central zone at F Pile. The other rupture occurred in the central zone at H Pile and was the cause of a process tube rupture and a water leak. The ruptured tube had been charged under PT-313-105-17-M, and contained slugs jacketed with 63 S aluminum. As yet, the ruptured piece has not been inspected and the type of failure is not known.

Three ruptured C Metal pieces were discharged from one H Pile tube on 8/2/53. Although no definite breaks in the cap or can wall could be noted, each of the pieces was swelled near the cap end, indicating that water had penetrated to the active regions of the slugs.

With no C Pile ruptures since June, the rupture rate at C remains comparable to rates at the other piles.

Group 9 Metal shows continued improvement over the best Group 8 Metal.

Higher Specific Power Operation

Production Test 105-532-A-2: Increased specific slug powers are being obtained by the irradiation of uranium slugs enriched to 1.75 per cent U-235. One tube was discharged during August and heavy corrosion effects were measured, in partial agreement with data from other sources. Two additional tubes were scheduled for discharge early in September. Evidence of non-purgeable film or diametrical expansion of high operating level slugs has been obtained from Panellit data. "Interim Report No. 2, Production Test 105-532-A-2", HW-28713, by L. W. Lang, presents the data so far obtained. Present maximum slug powers are about 60 kw/foot of uranium, which is equivalent to a tube output of 930 kw, were these slugs the maximum power slugs in a tube with normal cosine distribution of slug powers.

Production Test 105-533-A: The effects of increased tube powers localized in a central region of about 100 tubes in C Pile are being investigated by changes in the poison arrangement. Fifty tubes are now being operated at from 10 to 17 per cent above the tube power limit outside the experimental zone.

Pile Technology Sub-Section

Visual inspection of the slugs and process tube from the highest pilot zone tube showed no deleterious effects and, on this basis and with the data from the enriched pieces, the maximum tube power limit for C Pile was increased from 600 to 700 kw this month. Visual inspections of the slugs and process tubes from the pilot zone are planned at monthly intervals.

Operation of D Pile with Maximum Panellit Protection

Production operation with the reduced trip ranges continued to be satisfactory during August under Supplement A to Production Test 105-534-A. The use of approximately 30 per cent helium was required to maintain the graphite temperatures below limits.

Survey of Pile Safety

A survey has been initiated in an attempt to formulate a basic philosophy of Pile Safety.

Manual of Standard Practices - Physics

Three more documents pertaining to routine Area Physics work were issued during the month. These were: Item VII, "Scram Recovery Calculations", HW-28734; Item VII, "Records Kept by the Area Physicist", HW-28700; and Item VIII, "Flattening Procedures", HW-28701.

PROCESS PLANNING

Water Plant Expansion

A survey has been made of the additional technical information required to complete the preparation of the water plant expansion project, and of the development work which must be accomplished to permit ultimate utilization of the planned capacities.

Steps are being taken to provide Design personnel with clear statements of Technical considerations affecting this project where it is felt that present documentation is inadequate.

Water Utilization

Reactor Section plans for modification of process tube flow patterns and instrumentation have been reviewed and discussed. Venturi meters, single orifices, and double orifices will be employed to obtain maximum protection from the Panellit flow monitoring system and to improve the utilization of the available water supply. Agreement was reached on the scope of the proposed modifications and on the methods to be employed. Further discussion may be held on the scheduling of the changes to insure maximum net production and minimu conflict with current programs for investigating higher power operation.

Pile Technology Sub-Section

Goal Exposure

Attention is being given to the effect of increased goal exposure on plans for higher power operation. The principal effect of the higher exposure level is expected to be an increased rupture rate. Present outlet water temperature limits are based on corrosion effects at 600 MWD/T. Since there has been no correlation observed at these exposure levels between uniform corrosion and rupture rate, it was anticipated that considerably higher outlet water temperatures could be tolerated. Investigation of this possiblity will be continued, but the effect of the longer in-pile residence time on rupture may have considerable influence on the maximum outlet water temperature ultimately established.

PILE PHYSICS

Pile Enrichment

Timing of the C Pile enrichment program is currently being re-examined by both Technical and Manufacturing. The possibility of installing venturis at C Pile in November, plus the probable delay in obtaining additional enriched material, appears to make immediate re-orificing unattractive. Following discharge of the present enriched columns at C Pile, most of the "C" material currently on hand could be loaded as the first step in the large enrichment program prior to re-orificing; the other alternative being considered is to allow the present enriched columns to run to higher exposure, initiating the large enrichment program following venturi installation and pile re-orificing.

Additional test pile reactivity measurements of the effect of varying the aluminum dummy length in a J-Al dummy column were made by the Experimental Physics Sub-Unit. Preliminary results indicated that a column loaded with alternate four inch aluminum dummies and eight inch "J" slugs would have a reactivity effect approximately equivalent to a column of "C" slugs. The use of such columns may be required in support of the DR Pile P-10 program.

Following a review of the Oak Ridge "J" slug critical assembly data, shipping limits were specified for "J" and "C" slugs which permit full loading of the present style "J" shipping casks with storage limits corresponding closely in number of slugs per group (HW-29131, "Nuclear Safety in Storage and Shipping of Enriched Material", C. L. Miller).

Pile Control Studies

The study of safety control in the enriched pile has been completed and reported (HW-28706, "Safety Control Requirements in Enriched Piles", C. L. Miller and D. K. McDaniels). The solutions were obtained in terms of the number of enriched columns which would cause the dry cold clean pile with the safety system inserted to become just critical. The solutions obtained indicated that H and C Piles have sufficient available control for any contemplated enrichment program; B, D, DR, and F Piles do not have sufficient vertical

control to compensate enrichment; and that the K Piles would not have sufficient control with all steel balls only in the Ball 3X system. On the basis of additional calculations, it was recommended that boron-steel balls be supplied for the ten outer channels in the K Pile safety system for which vertical safety rods are not supplied (HW-29123, "Boron-Steel Balls for K Pile Safety Systems", C. L. Miller). Control of the enriched pile is especially sinsitive to the control strength of the channels adjacent to the enriched columns.

The completed net-point relaxation calculations of the effectiveness of the 29 rod VSR systems in the unenriched pile indicate that the B, D, and F Piles have a margin of safety of approximately 9 per cent, with all VSR's inserted in the dry cold clean pile.

On the basis of the findings from the above two methods, appropriate increases in control requirements have been recommended for process specification No. 59.00 (HW-27632).

Scram Transient Studies

Additional tests for evaluating safety control systems by scram transient analysis were made in the test pile. The IBM tabulations have been completed which show control strength as a function of both observed falling transient and the preceding rising transient; approximations employed previously in interpreting test pile data would give excessively liberal results for large amounts of control.

Experimental Ink Facility - PT-105-529-A

Further gas generation and reactivity calibration tests were made during equilibrium operation at DR Pile. The reactivity calibration tests consisting of simple rod "swap" measurements indicated the total range of control to be quite low; further analysis of these data will be performed by calculating a form curve for the rod calibration based on the flux distribution existing at the time of the experiment. Gas generation data as a function of flow were obtained with the ink concentration fixed first at 12 per cent, and then at 4.5 per cent. Data obtained at 1.0, 2.0, and 3.4 gallons per minute show that the dissociation of water is a function almost entirely of the concentration of boron in the recirculating system in the range of flows measured.

Exposure Calculations

Because of the close approach of E slug axial temperatures to the beta transformation point (about 665 C), and because their power output rate for a given flux is obscured by natural uranium slugs in the same columns, a theoretical check on E slug heat generation rates was made based on the appropriate thermal utilization factors. These calculations, which essentially confirm the original theoretical calculations performed by W. J. Oxeroff, indicate that E slugs (uranium slugs containing 1.75 per cent U-235) generate 1.79 times as much power as an adjacent natural uranium slug (HW-28986, "Power Output of E Metal Slugs", R. O. Gumprecht).

[redacted]

DECLASSIFIED

HW-29229

Pile Technology Sub-Section

SHIELDING STUDIES

Attenuation Measurements

Foils measuring the relative distribution of thermal and intermediate energy neutrons in magnetite and heated iron-limonite concrete have been counted during the month. The iron-limonite concrete had lost approximately one-third of its water content after three weeks at 100 C. Fast neutron detectors will be removed during the next DR Pile outage and ion chambers inserted. Interpretation of the data with respect to iron-to-hydrogen ratio will be attempted when all of the measurements have been completed.

Radiation and Thermal Damage Studies

Three devices for obtaining considerably more masonite damage data than was possible in the past were completed during the month: (1) an assembly for irradiating in the Y test facility a large number of samples in the flux gradient through the reflector region; (2) a small cylindrical oven for obtaining combined temperature and gamma radiation damage data; and (3) a tubular oven for obtaining thermal damage data over a temperature gradient.

Chemical analysis of masonite samples obtained at H Pile from the VSR step plugs, C Hole step plug, and vertical channels (chips from inner cycle) indicate that the masonite composition had not been seriously affected. Changes in density and in percentages of carbon and hydrogen were of the order of only 10 per cent, the first two properties increasing and the latter decreasing.

Only a small temperature rise in the front biological shield at C Pile has been observed by shield thermocouples as a result of displacing the surrounding columns upstream; it is concluded, therefore, that the damaging effect of back-seating is essentially that due to radiation. Side shield data taken simultaneously under the same production test (PT-105-543-A) have not been completely analyzed. Because of rising top shield temperatures, it was necessary to resume shield cooling water flow before the side shields reached equilbrium temperatures.

P-10 Shielding Measurements

Radioactivity data were obtained from six DR Pile P-10 slugs placed in casks and configurations encountered in the P-10 separations process in order to determine the radiation conditions to be expected (HW-29119, "Anticipated Dosage Rates in Separation of Savannah River P-10 Slugs", W. L. Bunch). Previous measurements by the Experimental Physics and Special Irradiations Sub-Units showed that the newer P-10 material fabricated at Savannah River was considerably more radioactive following exposure.

[redacted]

Pile Technology Sub-Section

EXPERIMENTAL PHYSICS

Slug Rupture Detection

The two channel scintillating crystal gamma ray spectrometer slug rupture detection system installed at H Pile to monitor the radioactivity level in effluent water as cyclically sampled from nine crossheaders continued to operate satisfactorily. This installation has been developed and is operating as a prototype of installations contemplated as replacements for the present pile beta monitoring systems which have proven inadequate in the slug rupture detection application. Current efforts are directed toward improving the methods of data presentation, effecting the simplification and increased reliability of electronic components, and increasing the signal to background response ratio still farther. These efforts are expected to result in beneficial refinements to the full pile gamma monitoring installations which will reflect decreased maintenance and more sensitive response; they do not adversely affect either the justification or timing of the projected beta system replacement effort and will be continued to permit a maximum of refinement to be incorporated into the replacement installations. Technical liaison with Reactor and Design Section personnel continued throughout the month with major consideration given to the preparation of the project proposal requesting authorization to proceed with the beta system replacement effort.

Measurement of Gamma Ray Absorption Coefficients

A series of measurements of gamma ray absorption coefficients, which were initially programmed several years ago but postponed because appropriate experimental techniques capable of yielding unambiguous results were not then available, have been initiated. The high energy gamma radiation accompanying the beta decay of N^{16}, which is formed through the O^{16} (n,p) N^{16} reaction in the pile cooling water, is being used as the source in this work, i.e., the measurements are made at the primary gamma ray energy of 6.13 Mev. Precise experimental knowledge of the absorption coefficients are important in shielding calculations as well as in the verification of the values calculated from theory.

Measurements to date have been made in good geometry using a specially designed N^{16} source at H Pile, a lead collimating system, and a gamma ray spectrometer as the detector. Coefficients have been determined for copper, cadmium, and tin with a 0.5 per cent statistical accuracy to give values which are consistent with previously published work.

Neutron Distribution in a Hanford Lattice Cell

Measurements of the distribution of fissions were made in lattices containing (1) standard uncanned natural uranium slugs surrounded by graphite, (2) standard aluminum canned natural uranium slugs surrounded with a process tube and water assembly as well as graphite moderator, and (3) uranium slugs enriched two and one-half times in U-235 content and surrounded by graphite alone. In addition, a measurement of the distribution of plutonium producing reactions in uncanned standard natural uranium surrounded by graphite was made.

Pile Technology Sub-Section

A formal report describing the distribution of fission and plutonium producing reactions in a standard natural uranium slug imbedded in a graphite lattice has been completed in rough draft form.

Radio-Isotope Analysis

Gamma ray spectroscopy techniques were employed to determine the increase in the intensity of gamma radiation possessing energies in excess of one Mev which will be experienced in tritium separations for the DR-10 program above that previously experienced in the H-10 program. An increased abundance of impurities, chiefly iron and antimony, was found in the lithium-aluminum target slugs prepared by duPont for the DR-10 program which results in a ten-fold increase in the higher energy gamma intensities, i.e., those energies which determine process shielding. These results agree quantitatively with a series of integral absorption measurements made jointly with Shielding personnel using irradiated H-10 and DR-10 target slugs.

Preliminary data have been obtained in a study to determine the radioactivity problem associated with the recharging of previously irradiated bismuth. The data indicate that irradiated bismuth pieces could be re-used following a thirty day decay period.

Instrument Development

A Beckman amplifier circuit designed to respond logarithmically has been stabilized sufficiently to permit its utilization in the measurement of rapid pile power transients through several decades in intensity. A series of measurements is planned to determine the response to gamma radiation of gamma-compensated, neutron-sensitive ionization chambers of GECL and ORNL designs. Electronic components for an instrument designed to measure directly the rate of pile power change, a quantity proportional to excess pile reactivity, are either on hand or being fabricated. Measurements to demonstrate the feasibility of including "pile period" monitoring instrumentation in the Hanford pile safety system circuitry will be initiated next month.

Automatic Tube Outlet Water Temperature Recording Facilities

The Flexowriter automatic tube outlet water temperature recording facilities at H Pile operated routinely in support of the enrichment program. The improved Flexowriter facilities at B Pile, which are prototype facilities for installations at the remaining piles to be sponsored by Reactor Section, also continued to operate satisfactorily.

Modifications to the Flexowriter recording system to permit three digit temperature recording have been designed and that portion affecting the electric typewriter is being checked with the vendor, the Commercial Controls Corporation. The Flexowriter development, design, and operation has been described in a formal report which is now prepared.

Pile Technology Sub-Section

Test Pile - Uranium Tests

Regular slug testing proceeded routinely during the month. Nineteen lots of Mallinckrodt billet eggs were tested yielding TDS values ranging from 13 to 16. Twenty-eight lots of Fernald billet eggs yielded TDS values ranging from 12 to 16. One Hanford egg lot yielded a TDS of 15.

Test Pile - Graphite Tests

Forty heats of TS-GBF graphite were tested with eight heats allocated blue and the remainder allocated green. The testing results to date are tabulated as follows:

Index Range	August		Total to Date	
	Purity	Effective	Purity	Effective
81	---	---	1	3
81-85	---	---	4	6
86-90	---	---	2	11
91-95	4	8	29	68
96-100	20	18	105	114
101-105	16	14	146	85
105	---	---	11	11

Express shipments from nine heats of GBF graphite produced by Speer were tested to yield a nuclear quality quite comparable to National Carbon material, although the results consistently average slightly lower.

Test Pile Calibration

A series of calibration measurements were completed which relate measurements on the K Pile size graphite (3 3/4 inch square cross section and 49 inch long bar dimensions) directly to the purity of the primary standards. No unexplained effects accompanied the reduction of the four inch TS-GBF secondary standards to the smaller graphite bar dimension.

The depression of neutron flux resulting from the insertion of an absorber in a diffusing medium was measured by inserting a cadmium cylinder into the Test Pile reflector and determining the change in the spatial distribution of neutrons which results by means of foil activation measurements. The measured distributions agree quite well with distributions calculated from theory.

Physical Constants Testing Reactor

Increasing emphasis is being given the scoping of an economical, stripped down prototype of the Physical Constants Testing Reactor as conceived to support the long range Hanford research and development programs. It appears quite certain that the smaller reactor can yield important physics data at a

much earlier date, that the bulk of the expenditures can be recovered as most components can be utilized in the later construction of the long range reactor, and as a minimum, the techniques and program developed in the small reactor will be directly reflected as acceleration in the large reactor program.

Scoping and preliminary design is proceeding to accurately establish the cost, manpower, and programming considerations pertinent to the inclusion of the prototype reactor in the Hanford program of lattice constants investigations. These studies are being jointly conducted by Pile Technology and Applied Research personnel.

HEAT TRANSFER

Tube Flow Studies

In conjunction with the program for obtaining increased water flow at the piles, tests are being conducted in the 100-F Flow Laboratory which are directed toward determining the maximum flow that can be obtained by modification of process tube inlet and outlet fittings. Preliminary measurements have been made of the pressure drops across the components of a C Pile tube under standard loading and fitting conditions with the exception that the orifice was removed. These data indicate that about 70 per cent of the pressure drop from header to header occurs in the tube, 27 per cent in the inlet fittings, and 3 per cent in the outlet fittings. Of the inlet fitting pressure drop, about 36 per cent occurs in the inlet Parker fittings, about 27 per cent in the pigtail, about 31 per cent in the pigtail-nozzle connection (including the cone screen and orifice retainer) and about 6 per cent in the inlet nozzle itself. These values are not strictly applicable to pile conditions because the tests were made under isothermal flow conditions, but are indicative of the magnitude of these effects in the pile. Thus, it may be seen that modification of the inlet fittings should lead to either significant increases in pile flow or decreases in pumping costs. At the other piles, somewhat different conditions will be encountered since the annuli and outlet fittings are smaller than those at C Pile.

New curves were calculated for the header pressure requirements after an electrical power failure. It was determined on the basis of data taken at D Pile that the present pump pressure decay characteristics are adequate to prevent serious boiling in the downcomer after a power failure for a 95 C equilibrium outlet temperatures. That validity of the specification for the other piles is dependent upon the conditions that downcomer pressures there are not less than the downcomer pressures existing at D Pile.

The effect of slug cocking on process tube flow rates was investigated. The slugs were held in the tube in such fashion that the maximum possible amount of cocking existed. Preliminary data indicate that, for such a condition, the flow through a C Pile tube having a 400 psig header pressure and a 0.318 inch orifice would be reduced on the order of 8 per cent. The flow through a standard annulus tube having a 0.285 inch orifice would be decreased about 9 per cent.

Pile Technology Sub-Section

Work has continued on the preparation of a report on two phase flow pressure drop. The data which will be reported were obtained on the full-scale mock-up. The purpose of the report is to disseminate basic information to other sites which may also find it useful.

Fuel Element Studies

Six slugs were thermally cycled during the month to axial temperatures near or above the beta transformation point (approximately 665 C). The surface temperatures were held below about 125 C, and the number of cycles per slug varied from 15 to 40. The purpose of this work was to obtain additional statistical data on the effect of cycling. The results were very similar to those obtained earlier. The specimens all shortened in length (an average of about 20 mils for each 4 inch slug) and each became enlarged in diameter along its central two-thirds of length (an average of about 3.5 mils).

In order to obtain additional information on the rate of transformation, it is planned to cycle a non-heat treated alpha rolled slug to a core temperature of 730 C. Only one cycle will be impressed on the specimen, and it will be held at the maximum temperature for only a few seconds. The specimens will then be sectioned, etched, and photographed.

Final preparations were made for publishing the first report on the results of the slug-cycling investigations, and a second report is in the process of preparation. It should be noted that these investigations have been possible only through the relatively extensive assistance and close cooperation of personnel from both the Fuel Technology Sub-Section and the Metallurgy Unit of the Applied Research Sub-Section.

Efforts have continued to obtain design and cost data for additional electrical generation equipment to permit more extensive studies of the effect of thermal cycling on slug stability. In addition, this equipment will permit the study of process tube cooling under conditions more closely simulating those of the pile.

Production Test 105-545-A, "Measurement of Slug Surface and End Cap Temperatures", R. P. Schmitz, HW-28850, July 28, 1953, was issued during the month, authorizing the insertion of a slug in a pile having both surface and end cap thermocouples. It is hoped that the slug can be installed in the F Pile at the next shutdown. The corrosion test of the prototype of the above slug is continuing with no excessive corrosion observed after exposure to 95 C water for eight weeks. Flow laboratory tests were conducted to compare the tube flow for a standard slug charge with the flow which will accompany the thermocouple slug charge. It was found that the two are essentially identical.

Data on the thermal conductivity of uranium at temperatures above 400 C are both sketchy and inconsistent with the result that slug axial temperature

calculations for temperatures in the range above 500 C are questionable. To obtain a direct measurement of such temperatures, an enriched slug having an axial thermocouple is being prepared for insertion in the C Pile. It is planned tentatively that the slug will be exposed in such fashion that its axial temperature will be in the vicinity of 650 C. Special emphasis is being given to development of the slug specimen in order to insure that the slug will not fail during pile exposure.

The investigation of the thermal conductance of uranium-aluminum bonds has centered on various equipment tests made in an effort to evaluate the reliability of test results. In addition, studies were made to determine the feasibility of using this equipment to measure the conductivity of uranium at temperatures above 400 C. It is planned to run exploratory tests of this type during the next few weeks.

Preliminary calculations to determine the effect of the use of smaller slugs in a standard tube from a flow and slug temperature viewpoint were completed. They indicated, tentatively, that the present annulus is about optimum and that the use of smaller slugs would lead to temperature gradients on the slug surface. A slug 10 mils smaller in diameter than the present ones would have a temperature gradient between the surface at the top of the slug and the surface at the bottom of about 20 C for a tube temperature rise of 60 C and a flow of 30 gpm. This difference increases with decreasing diameter to about 80 C for a 30 mil smaller slug at a temperature rise and flow of about 60 C and 34 gpm, respectively.

Additional studies have been made to determine the effect of normal slug and tube tolerances on tube flow. Preliminary results indicate that the flow may vary up to 5 per cent from tube to tube, depending upon the actual component dimensions.

Graphite Temperature Studies

Calculations are being made of the temperature gradient in the D Pile graphite to obtain a better understanding of graphite behavior. Similar calculations were made previously for an H Pile lattice, but it was believed that the results were relatively inaccurate. In the previous study, the effect of control rod position was not given adequate consideration; in this newer study, much stress is being placed on the effect of control rod location on local heat generation rates and graphite temperatures. The preliminary results look more promising than those for the H Pile.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

Assistance was given Heat Transfer personnel on tests to determine the effect of cocked slugs on process tube flow rates.

Pile Technology Sub-Section

A report, HW-28996, has been issued containing suggestions for improvements to the present charging machines. The needed changes in design for improved operation are outlined. The new machines are being fabricated for F Area in accordance with the suggested changes. Document HW-28926, "Characteristic Scratch Marks on Cocked Slugs", has been issued. This will be of assistance in slug examination work in recognizing those marks due to cocking as compared to marks resulting from corrosion.

An interim report on slug column bowing, HW-28809, has been issued. Equipment to measure the loading of an in-pile column and its linear expansion due to temperature change has been designed. Parts have been fabricated or are on order. An in-pile test will be conducted as soon as the equipment has been assembled and tested.

Slugs coated with a water soluble coating to prevent scratching during normal charging have been evaluated in the corrosion mock-up. Weight loss for these slugs has been found to be 25 per cent less than for the uncoated slugs, indicating that this coating, applied to prevent scratching due to charging, may assist in corrosion reduction.

Horizontal Rod Studies

Further difficulties have been encountered in the fabrication of the modified horizontal rod at the B Area shops. Welding the sections of the rod together has caused distortion of the assemblies. The pressing equipment for the boron carbide sintered rings has been assembled. Minor modifications are being made to the dies to provide proper sized rings. Drawings have been completed for a transition piece for the new elliptical rod to the present B, D, and F rack. Fabrication has been started.

The old type external thimble for the horizontal control rod conversion has been tested with unsatisfactory results. Excessive gas leakage has been found to occur. A new type of external thimble has been devised utilizing a six inch ID rubber tube extending between the bearing blocks. The old type rollers in these bearings have been replaced by brackets containing graphite bearing surfaces. The brackets have been fabricated and the rubber tubing for the thimble is on order.

Vertical Rod Studies

Tests last month demonstrated that the segmental metallic ring seals could not be used for the vertical safety rods. A washer-type seal has been developed that is believed to fulfill the required performance characteristics and is now being tested. Initial results indicate good sealing qualities.

Testing of minor components of the vertical safety rod system for K Pile continued during the month at the White Bluffs Test Tower. A system

utilizing the K type rod has been devised with a method of applying air pressure to the top of the piston. Initial testing with this device has demonstrated reductions in the required drop time of about 1.8 to 1. Further experimental work along this line will be continued until the actual K Pile rod arrives and can be installed.

Supplemental Control

The ink system "Denistrol" solution density control was tested during DR Pile shutdown. Testing was satisfactory but leaks were discovered in the inner rod room in a drain line. Radioactivity levels were too high to permit repair, and the system was drained. Subsequent to this, Operations expressed a need for the system, and it is now in use. An analysis of the gas generation rate indicates that this is independent of flow and pressure within the operating limits of the equipment. Reactivity tests were conducted at the end of the month. During operation with a 10 per cent potassium tetraborate solution, a general drifting of the Denistrol has been noticed. Tests indicate that this is a result of gas formation depleting the water from the solution and effectively increasing its concentration.

Fabrication has been completed on components to be used in the BF_3 supplemental control system, and it is intended that this will be assembled during the next month. This system consists of a neutron absorbing gas, the control function of which is dependent upon pressure changes. Samples of BF_3 gas are being irradiated in C Pile with the results scheduled to be obtained during the next month.

Process Tube Pressure Limits

Document HW-28853, "Allowable Tube Inlet Pressure", was issued during the month. In brief, the report states that the present limit on allowable tube inlet pressure is conservative and that a gain in tube flow can be made by increasing the allowable and actual tube inlet pressure. This document reviews the safety, economic, and technical aspects which must be considered in the determination of safe working pressures.

Materials Testing Reactor Test Facility

A trip to the Materials Testing Reactor at Arco was made earlier this month by the engineers assigned to scope a proposed fuel element test facility. Results of the discussion held at that site have permitted a preliminary design to be promulgated. Document HW-29113, "Fuel Element Test Facility for MTR", has been issued. Work has been stopped pending management approval of the program.

Physical Constants Testing Reactor

Work on preliminary designs of the components for the Physical Constants Testing Reactor was continued during the last month. The horizontal control rod system,

vertical safety device, carriage for moving one face of the reactor away from the core, and supplementary framework are being studied. Contact work has been carried out with Project Engineering personnel who are preparing the building design. Detailed design and fabrication of the pile components is being held in abeyance pending management decision as to which pile or piles will be built.

SPECIAL IRRADIATIONS

The assembly for studying the effects of pile irradiations on boron control rod and shield cans (KAPL-114) was charged in VSR channel No. 21 at C Pile. In-pile performance of this experiment has been satisfactory.

Stainless steel samples for tensile, flexure, and impact testing and zirconium covered fuel plates enriched with U-235 (KAPL-120) were charged in the P-13 Loop. Extensive repairs to the loop necessitated operation on process water the major portion of the month.

The p-type germanium crystals bombarded by fission fragments (KAPL-115) continue to generate electrical currents. A first order dependence of the magnitude of the electrical currents upon power level has been established. The heater in the experimental assembly for the creep rate of fuel pins (KAPL-105) continues stable operation at 630 C. Approximately 0.13 cc of fission gases have been released from the 93 per cent enriched uranium foil containing 0.079 grams of U-235 (KAPL-108) after an exposure of 2.5 x 10^{20} nvt (thermal). Calculations show this amount to be a very high percentage of the total number of gaseous fission fragments formed in the foil.

Additional data to establish uncertainties are being obtained. The Production Accountability Office reports an exposure of 631 MWD/T for this exposure. Exposure data taken with special instrumentation during the channel instrumentation is being completed to compare with this number. Out of pile irradiation studies pertaining to the creep rate of zirconium (WAPD-111) continue at 105-B. Erratic behavior of thermocouples in the thermocouple test assembly in F Pile remain attributable to insulation failures. Fabrication of a new type test hole magazine for replacement of the magazine in F Pile has been completed.

Extended assistance has been given to programs sponsoring irradiations of graphite and metallurgical specimens. Isotope production and irradiation of materials for off-site and other Hanford programs continue.

GRAPHITE STUDIES

Graphite-Carbon Dioxide Reaction Rates

As part of a program to check the effect of laboratory conditions on the observed burnout rate of graphite, the flow rate of carbon dioxide over the

graphite sample was varied during a run. The results indicate that the burnout rate was dependent upon the flow rate up to a certain flow when the burnout rate became independent of the flow. A flow rate of 100 cm^3/min corresponding to a linear velocity of 27 cm/min, is well within the region of flow independence for the standard 0.4 inch diameter sample.

Radiation Induced Gas-Graphite Reactions

Mass spectrographic analyses of the residual gases from the samples of graphite and selected gases exposed to the intense γ ray flux at the MTR have been received. The samples were exposed at a temperature of about 30 C to a gamma flux of approximately 10^6 R/hour. These analyses show the reaction of oxygen and graphite to follow the equation $C + O_2 \longrightarrow CO_2$ at a burnout rate of about 0.3 per cent per 1,000 days. Samples of CO_2 and graphite show a burnout rate of about 0.01 per cent per 1,000 days. Samples of CO_2 + 15 per cent He show a rate comparable to that of pure CO_2 and graphite. Samples of pure CO decomposed by the reaction $5\ CO \longrightarrow CO_2 + C_4O_3$. Thermal decompositions of the solid residues from these samples have been run but the analyses of the resulting gases have not yet been obtained.

In-Pile Burnout Experiment

In order to provide burnout data for the re-evaluation of the pile graphite temperature limit, PT-105-514-E was initiated. The first set of samples from this test was discharged on August 10 from F Pile. Difficulties encountered in the discharge of the samples decrease the confidence that can be placed in these initial results. However, the data indicate that the burnout rate at 530 C in a 550 MW flux does not exceed 8 per cent per 1,000 operating days. On the basis of these data, it appears that no hazard is involved in running a full pile production test at relaxed graphite temperature limits. This production test to determine the validity of extrapolation of small scale data to full pile operation is now being written.

Pile Monitoring

Full sized bars of TS-GBF graphite were charged into the D test hole of C Pile on August 6. The physical dimensions, weight, and nuclear purity of these bars previously had been determined. After discharge, these measurements will be repeated to obtain the effect of pile irradiation upon the nuclear purity and physical properties of full sized bars of this material.

Graphite samples were removed from process channel 1277-D on August 20. These samples were taken after three months of D Pile operation at the higher power levels and helium concentrations authorized by PT-105-534-A, Supplement A. The crystallite expansion profile along the channel indicates that this channel is intermediate between the typical fringe channels and the central channels mined as a base point. Based on previous mining experience, this traverse indicated that the helium addition may be aggravating tube block irradiation damage.

Pile Technology Sub-Section

Graphite for the K Piles

Within the month, the first TS-GBF tube blocks for the KW Pile were surfaced. Inspection of these blocks revealed a percentage of cracked material many times greater than any material used in previous piles. These cracks were internal cracks in the sense that they did not appear upon the surface of the raw bars. The cracks were revealed when the bars were machined to a cross section of about 3 3/4 inches. This is the first time that this type of cracking has appeared in any of the graphite produced for pile use. Sections of representative bars and maps of the cracks within those bars indicated that once the cross section had been brought down to about 3 3/4 inches, a visual inspection of cracks served as a good criteria for the condition of the bar inside the 3 3/4 inch cross section. A study of the consequences of this cracking in terms of future operational problems of the K Piles was made by designated organizations. The resulting decision was that, as far as could be foreseen now, cracked bars that passed appropriate visual and test inspection standards would be suitable for use in the K Piles.

It was concluded, however, that the difficulties of predicting the future behavior of the K Piles are such that, if possible, an insurance factor should be introduced into the construction of the piles. This safety factor amounts to zoning the pile so that the best tube block material is allocated to the upper regions of the pile where the graphite distortion problem is expected to be most sensitive. Tube blocks having greater proportions of cracks are then to be zoned to the lower portions of the pile where it is expected that the consequences could not be serious.

Technical methods have been devised so that it is possible to predict the cracking index for a given heat. These methods are being used to schedule the material through the machining operations so that the pile zoning as described above can be realized. Thus, where possible within the present lay-up schedules for the KW Pile, such a zoning will be carried out.

V. C. Hamister and R. L. Mansfield from the National Carbon Company visited Hanford in order to study the problem. As a result, they are making changes in their process with the aim of eliminating cracked material from much of the graphite which will be used in the KE Pile. The methods which are to be tried involve a change of procedure in one of the firing processes and the addition of a swelling inhibitor to the raw bars.

With the probability that TS-GBF graphite with an inhibitor additive will be used in much of the KE Pile, it is necessary that this material be suitable both as a pile moderator and as a pile material. Important properties to be considered regarding graphite as a pile moderator are those of purity and density. Results obtained from similar inhibitor treated graphite produced in the G-3 development contract, give a preliminary indication that the material is comparable to regular TS-GBF in terms of DIH purity. Also, on the basis of information gained from that contract, it is expected that

the density of the treated material will be significantly higher than the regular TS-GBF. Because of the importance of higher density for increased reactivity of the pile, this effect is in the proper direction. The first production heats of the treated graphite will be extensively examined by the Experimental Physics Sub-Unit in order to test the validity of these conclusions.

As indicated above, the treated graphite must also be suitable for use as a pile material other than with respect to its cracking properties. Some data has already been obtained on its properties using material produced in the G-3 development contract. Other information will be obtained shortly from irradiation experiments which were begun in the past. To the extent to which the material produced under G-3 can be considered representative, it can be concluded that the machinability of the graphite is comparable to, or perhaps slightly better than, TS-GBF graphite produced without treatment. Measurement of thermal conductivity, electrical resistivity, and Co spacing indicate that no appreciable changes in the initial properties of the graphite will be produced by the swelling inhibitor treatment. During the month of September, some of the prototype material will be discharged from a water cooled test facility with an exposure of about 500 MD/CT. The data from this discharge will be indicative of any difference in radiation damage characteristics caused by the special additives.

WATER PLANT DEVELOPMENT

Flow Laboratory Studies

Operation of the five in-pile water quality experimental tubes continued in the evaluation of water with caustic pH adjustment and with no pH adjustment. It is anticipated that these tests will be completed in October of this year. The first laboratory data from the raw water tests indicate that aluminum corrosion will not be a severe problem with low turbidity. Considerable film formation occurred in the experimental tubes, and work is now under way to develop a means of minimizing film rates.

Tests of the model K downcomer are essentially complete. Test results show that satisfactory flow patterns are obtained with a reduced number of guide vanes in the approach section. In connection with the present water plant expansion study, a model of the F downcomer is being designed for use in determining the adequacy of existing effluent systems at increased flow rates.

The C horizontal rod corrosion test has been completed and the final test report is in progress. A Design Test of the K rear face resistance thermometer has been accepted, and fabrication of the necessary equipment is under way.

Detail design of the K Flow Laboratory progressed satisfactorily with close cooperation of Technical and Design personnel.

Pile Technology Sub-Section

Water Quality Evaluation Tests

The plant test at DR continued to evaluate the requirements for chlorine addition to process water. A short period of film formation occurred, but no significant difference was noted between the chlorine and non-chlorine sides. Inspection of front tube sections on each side of the pile showed no detectable difference in corrosion attack between the two sides. The production test aimed at improvement of the alum-activated silica preparation process has been approved and plant tests at 183-C will begin immediately. A production test to evaluate the use of lime-free water on a plant scale is being circulated for approval.

Recirculation Studies

The in-pile recirculation loop at 105-H operated satisfactorily during the month. The flow laboratory recirculation test with 25 ppm impurity water was completed and the data are being evaluated; a test with 50 ppm impurities is now under way. Installation is proceeding on the apparatus for testing aluminum corrosion resistance to various types of water at temperatures between 300 and 350 F.

Water Plant Expansion Studies

A flow test conducted at 183-D filter plant showed that a flow of 39,500 gpm through one-half of the filter plant can be achieved with minor modifications. A technical recommendation is being prepared describing alterations to existing filter plants necessary to achieve total process water flows of 72,000 gpm. Further progress was made in calculating other limiting points in the water plants' piping and pumping system.

PILE COOLANT STUDIES

Production Tests

Six tubes with exposures between 200 and 260 MWD/T were discharged under PT-105-519-E. These tubes operated at a maximum outlet water temperature of 98 C. Weight loss measurements are now being obtained. New metal was charged into the six tubes for operation at the higher power levels now prevailing at C Pile. The tubes on this production test are currently operating between 100 and 107 C.

The fourth test assembly for determining the effect of irradiation on corrosion under PT-105-510-E has been discharged from the Z test hole at 105-H. The radioactivity from the samples is being allowed to decay for one month before measurements are taken. An interim report on the production test, HW-27531, has been issued.

An analysis of panellit pressure data for tubes operating under PT-105-532-A, which was made in conjunction with the Process Technology Sub-Unit, indicated an increase in pressure drop across the tubes which was difficult to attribute

to film build-up. It is possible that some distortion of the slugs was causing this effect. More complete data will be necessary before final evaluation of the observed effect.

Laboratory Corrosion Studies

The test of the effect of low concentrations of dichromate on front tube corrosion has continued in the fifty tube mock-up with concentrations as low as 0.1 ppm dichromate still showing no barnacles after five months' operation. The exposure of slugs coated with various abrasion-resistant coatings, developed by Mechanical Development Sub-Unit and Corrosion Sub-Unit, showed no significant difference from ordinary production type slugs after 40 days at 95 C. Slugs which had been autoclaved for 20 and 40 hours showed less weight loss exposed at 95 C in flow laboratory tubes for 40 days than unautoclaved or six hour autoclaved slugs.

A 30 day exposure of aluminum samples at 93 C and 19 C in the field of a high current alternating flux showed no difference from samples away from the flux. On this basis, it is believed that the apparatus being constructed to study corrosion under simulated pile conditions will not give false results because of the use of alternating current for heating the samples. The high temperature apparatus which began operating this month at 150 C was unable to maintain this temperature because of equipment difficulties. These are being corrected for operation in the immediate future. The apparatus to study the effect of pH and temperature on aluminum corrosion is almost completed and should begin operation during September.

The use of a petrolatum paste containing an insoluble chromate and a zinc powder was recommended to Process Sub-Section personnel for application to the outside of their proposed venturi meters to prevent corrosion that would cause the venturis to stick in the nozzles. Sodium dichromate labeled with Cr^{51} is being used in a laboratory test to determine the rate of adsorption of dichromate on aluminum. The distribution of the dichromate on the aluminum will be determined by radioautographic techniques. Three methods for determining instantaneous corrosion rates in the pile are being simultaneously investigated. These include a classical, analytical, and a radiochemical method for determining aluminum in the inlet and effluent water streams as well as a method using the corrosion of a fine wire.

Several sections of new process tubing in their standard cardboard wrappers were alternately dampened and allowed to dry to simulate storage conditions. Several blisters in the aluminum were found after three months' exposure.

Pile Tube Examinations

Eight process tubes from C, DR, and D Piles were examined during the month. Two tubes removed from C Pile were completely examined within less than a week from the discharge date. These tubes, one of which was located in the hot spot and the other which contained Eisenhower slugs, showed no unusual corrosion damage.

Pile Technology Sub-Section

Partly as a result of this examination, C Pile has been authorized to raise power level. Tubes from D Pile under PT-105-534-A were also examined this month and showed no corrosion effects that could be attributed to the present method of operation at that pile.

The process tubes that were removed from B Pile before dichromate was again added to the water showed large areas of 72-S removal and pitting into the 2-S. The maximum pit depth found was 13.5 mils into the 2-S aluminum. No 2-S removal was observed on eleven sections from process tube 2175-C which had been in C Pile on alum water with dichromate for eight months.

Equipment improvements in both the 108 cave and the basin facilities have made tube examination proceed more rapidly. The small number of tubes examined in the cave during August was the result of a two week shutdown caused by the failure of the main exhaust fan motor.

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

RBR:eb

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

AUGUST, 1953

VISITORS AND TRIPS

B. Weidenbaum visited here from Dow Chemical, Rocky Flats Plant, Denver, Colorado, August 2 through 8, for technical discussion on specifications operations and technical matters.

C. L. Schuske visited here from Dow Chemical, Rocky Flats Plant, Denver, Colorado, August 3 through 7, to discuss nuclear safety.

A. L. Dighton visited here from Dow Chemical, Rocky Flats Plant, Denver, Colorado, August 10 through 13, on radiographic and auto-radiographic procedures.

C. Gieszl visited here from University of California Radiation Laboratory, Pasadena, California, August 3, working and checking over Spectrographs.

V. R. Cooper visited Dow Chemical, Rocky Flats Plant, Denver, Colorado, August 13 and 14, to discuss operating and process experience at Rocky Flats since start-up in order to evaluate at application of information to redesign of Task I, II, and III at Hanford Atomic Products Operation, and review weapon core specifications.

W. R. DeHollander visited Los Alamos Scientific Laboratory, Los Alamos, New Mexico, August 17 and 18, to discuss vacuum tank design procurement and use for P-10 facilities.

E. F. Kurtz visited Standard Steel Company, Los Angeles, California, August 3 and 4, for conference on recuplex vessel order.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	July	August
Administrative	2	2
Chemical Development	88	95
Plant Processes	54	52
P-10 Process Studies	9	10
Analytical Laboratories	44	41
Total	197	200

Chemical Development: One Chemical Engineer was hired, one Technical Graduate - Rotational was transferred in from Technical Services, one Stenographer was transferred in from Plant Auxiliary Operations - Steno Services, three Junior Engineers were transferred from Fuel Technology, one Secretary "C" was promoted to a Secretary "B", one Technical Graduate - Rotational was transferred to the Project Section.

P-10 Process Studies: One Junior Engineer was transferred in from Pile Technology.

Analytical Laboratories: One Junior Engineer terminated, two Laboratory Assistant "A"'s were transferred to Manufacturing Department.

PUREX DEVELOPMENT

Purex Plant Design Liaison

Redesign of the Purex concentrators progressed during the month. A vertical tube basket type heat transfer surface (employing remotely replaceable bundles)

was selected for the heating unit design. The Purex plutonium concentration equipment and dunnage design was examined for nuclear safety by the Physics Unit, and comments were forwarded to the Project Unit.

Chemical Engineering Development

Prototype Pulse Column Tests - Twenty-five Purex process test runs with "cold" uranium in a full scale (24 inch diameter) prototype HA Column and associated HC Column during the month have culminated in the development of an effective phase redistributing device greatly improving the performance of the HA Column, permitting the attainment of losses of less than 0.1 per cent at conditions approximating those of Purex Chemical Flowsheet HW #2, at uranium processing rates ranging from 3 to 15 tons/day. The highlights of these and other new findings are presented below.

1. In the absence of phase redistributing devices the uranium losses from the HA Column with a 24 inch diameter, 13.5 foot high extraction section were much higher than indicated by 3 inch and 8 inch diameter column results. In contrast with 3 inch and 8 inch column indications of uranium losses of 0.01 per cent or less under the conditions tried in the 24 inch column, typical 24 inch HA Column losses ranged from 0.14 to 15 per cent. When the newly developed louver-plates (see below) were not used, gross channeling in the column was evident from visual observations through the bull's-eye sight glasses on the side of the column, and from local samples withdrawn from sample valves located along the side of the column.

2. The presence of quadrant baffles in the extraction section of the HA Column exerted no significant effect on uranium losses with 120 per cent of the Flowsheet HW #2 solvent flow. However, the beneficial effect of a substantially increased solvent flow was greater with the quadranted column as compared to a unbaffled column; indicated by one comparison at 150 per cent of the flowsheet solvent flow, 10 tons U/day, 60 cycle/minute, in which a 0.5 per cent uranium loss was obtained with the quadrant baffles and a 4 per cent loss without.

3. HA Column losses in the neighborhood of 0.01 per cent with solvent flow as low as 105 per cent of the flowsheet rate were obtained with redistributor plates (designated "louver plates") designed to impart a swirling motion to the column contents. The redistributors consisted of horizontal stainless steel plate fitting snugly into the column and provided with four 5 inch long radial louvers oriented counterclockwise upward, giving a total free area of approximately 6 per cent. Such redistributors were located 14, 40 and 80 inches from the top extraction section sieve plate. A 6 inch free space section above and below each redistributor was left free of sieve plates. A jet mixer type feed (HAF) distributor, with four 1/2 inch tangential nozzles, was used in conjunction with the louver plate tests. The following is a summary of the findings with the louver type redistributors:

Rate, Tons U/Day	Frequency, Cyc./Min.(a)	Solvent-to-U Flow Ratio, % of Flowsheet HW #2	% U Loss(b)	Simple or Dual-Purpose Column
3	60	95	0.01	Dual
	70	110	0.0006	Dual
10	40(c)	120	0.02	Simple
		95	0.09	Simple
		95	0.6	Dual
15	40	105	0.01	Dual

Notes

(a) Amplitude: 0.92 in.

(b) With 13.5 foot high, approximately 24 inch diameter extraction section.

(c) The complete flooding frequency at 10 tons/day with 120 per cent of flowsheet solvent flow was above 40 but below 60 cycle/minute.

4. The performance of the 27 inch diameter HC Column used in conjunction with the prototype HA Column was consistently good, with uranium losses of 0.02 per cent or less from the 17.8 foot high plate section. The HC cartridge employed dual-faced plates, i.e., Kel-F NW-25 plastic undercoated stainless steel plates, with 1/8 inch holes, 23 per cent free area, 2 inch plate spacing.

Three Inch Pulse Column Studies - Eleven 3 inch diameter pulse column runs utilizing standard perforated plates (23 per cent free area) were made in support of the pulse column investigation. These studies demonstrated: 1) the solvent-aqueous system employed in the Purex Prototype was normal in behavior, 2) insertion of 6 per cent free area "louver" plates permitted ratio equivalent to 18 tons/day in a 24 inch diameter Purex HA Column provided the louver plates were installed with the flaps upwards - when reversed with flaps downwards the flood point occurred at a rate equivalent to 10 tons/day.

Mechanical Development

A Johnston 6AC, 5 stage, deepwell turbine pump, Uranium Recovery Plant pump P-19-7, has been equipped with gas baked finish pile graphite bearings. This pump has operated on life test for 160 hours pumping 60 per cent nitric acid at approximately 70 gal./min. against a 10 foot discharge head. After 45 hours of operation the pump was dismantled for inspection. Bearing wear was not excessive, ranging from 0.5 to 2.2 mils.

Bearings for Purex "Hot" Pumps - Based on the results of test work comparing graphitar with pile graphite as a bearing material, pile graphite with a gas baked finish was recommended as a bearing material for the Purex "hot" deepwell turbine pumps.

Bearing Development - Gold bearings fabricated from three different alloys, 75 per cent gold - 25 per cent silver, 75 per cent gold - 25 per cent copper, and 75 per cent gold - 15 per cent silver - 10 per cent copper, have been received and will be tested on the bearing test machines as a possible alternate process solution lubricated bearing material.

Pulse Generator Development - Five Teflon bellows manufactured by the United States Gasket Company are operating on life test. None of these bellows shows any indication of failure after 3 million to 40 million cycles.

Materials Testing

Evaluation testing of Polyclad "33", Carbo-Kote 6020, "B" Resin, and Socony Vinyl protective coatings for resistance to various process type exposures to aqueous and organic systems disclosed that all except Carbo-Kote 6020 were rapidly attacked by Redox and Purex type solvents although they demonstrated average resistance to caustic and nitric acid.

REDOX DEVELOPMENT

Process Studies

The following informal report was issued during the month:

HW-28799, "Silica Gel Tail-End Treatment for Redox." R. J. Sloat, August 17, 1953.

In this document, prepared as a joint effort with the Plant Processes Unit, five schemes for the treatment of the uranium product stream for the removal of Zr and Nb are considered. Three of these schemes involve treatment within the Processing Building (202-S) while for the other two treatment is performed in silica-gel beds installed outside the building in the vicinity of the concentrated UNH storage tanks (204-1 and 204-2).

Process Chemistry

Head End: Controlled Scavenging - The laboratory "cold" work directed toward an improved controlled scavenging, as discussed last month, was applied to "controlled dissolving" of MnO_2 cake by oxalic acid, a more economical agent than chromic nitrate. Uranium solutions containing permanganate were treated with less than stoichiometric amounts of oxalic acid to reduce the $KMnO_4$ to MnO_2 by "catalytic reduction", and the MnO_2 was then dissolved by additional oxalic acid. Preliminary results indicate that 110 to 120 per cent of the stoichiometric amount of oxalic acid is required to dissolve the desired amount of MnO_2, in this second step.

URANIUM RECOVERY DEVELOPMENT

Process Chemistry

Kinetics of Uranium Transfer - The study of the rate of uranium transfer under simulated RA Column conditions was continued. Tentative conclusions which may be drawn from the new data include the following:

1) The rate of uranium transfer under RA Column conditions is quite slow compared to Redox or Purex IA Column conditions.

2) The rate of uranium transfer is dependent upon solvent history. Reductions of 30 to 35 per cent in the rate of transfer have been noted for plant ROO as compared with a solvent prepared from fresh chemicals. Darco (activated carbon) scavenging or an alkaline wash of the solvent essentially restores the original characteristics of the solvent.

3) The rate of transfer may be increased by 30 to 35 per cent by increasing the temperature of the system from 25 to 50 C.

4) The addition of ANN to the feed or scrub increases the rate of uranium transfer, presumably through complexing of phosphate ion.

RA Pulse Column Studies - A series of RA Column runs has been made in a 1/2 inch diameter pulse column, using 5.5 year aged metal waste, to determine the effect of temperature, pulse frequency, and solvent history, on fission product decontamination and uranium waste losses. A 10-fold decrease in uranium waste loss and a slight improvement in decontamination were obtained by increasing the operating temperature of the column from 25 to 50 C. Operation at 50 C with the pulse frequency increased from 30 to 60 cycles/minute decreased the uranium waste loss an additional 10-fold and resulted in a 3-fold increase in decontamination. Essentially the same results were obtained when only the extraction section was heated. The comparison of plant ROO with laboratory prepared RAX shows the latter to be definitely superior as regards uranium extraction, and slightly better from the standpoint of decontamination.

CONTINUOUS UO_3 CALCINATION

An external feed system has been built to insure more positive distribution of powder and feed into the fluid bed calciner. In the external feed system, powder is recirculated from the bottom of the fluid bed through an external tube and back to the top of the bed by means of air. Feed is introduced in the external tube. Initial runs are designed to investigate optimum powder velocity (recirculation rate), powder feed ratios and operating characteristics.

The pilot plant screw calciner has been redesigned to incorporate adjustable and interchangeable paddles to provide flexibility in investigating the optimum conditions of calcination in this type of continuous equipment.

HOT SEMIWORKS

Maintenance work was completed early in the month and Redox process operation was resumed with Run HR-9. This run was characterized by persistent emulsions and poor decontamination efficiency during solvent extraction. This adverse behavior is tentatively ascribed to the lack of centrifugation of the feed stock (due to a frozen centrifuge feed pump, since freed) and the routing of this feed stock through the waste concentrator in bypassing the centrifuge. The flowsheets tested included:

(a) permanganate volatilization of ruthenium followed by total dissolution of MnO_2 with chromic nitrate,

(b) wash flowsheets in the 1A and 2D Columns,
(c) the passage of the hexone saturated 2EU through silica gel, and
(d) a reflux 2A-2B Column system.

While the run cannot be considered representative of flowsheet conditions, the following observations are considered pertinent:

1. Emulsification in the 1A Column was apparently limited to the scrub section, since the 1AW losses were low: 0.026 per cent U, 0.073 per cent Pu in the first half of the run.

2. The reflux 2A-2B flowsheet did not reach equilibrium but an over-all gamma logarithmic decontamination factor of 6.9 (referred to dissolver solution) was obtained. More than 95 per cent of the residual activity was ruthenium.

3. The silica gel bed performed well. Over-all gamma logarithmic decontamination factors were increased from approximately 4.3 to 5.7 by the silica gel treatment.

Run HR-10 is now in progress after a stuck 1AF rotameter and a partially plugged 1AW let down valve delayed the start-up.

The "head-end" portion of HR-10 confirmed previous Process Chemistry laboratory studies employing oxalic acid as a catalytic agent for reduction of MnO_4^- to MnO_2 and as a stoichiometrical reagent for reductions of MnO_2 to Mn^{++}. The final MnO_2 content of the systems was analyzed to be 0.008M vs. 0.010M calculated.

The Ru decontamination for the "head-end" treatment was 20 (dF = 1.3).

Conversion to Purex

Detail design of the major engineered process equipment items has been completed except for the hydraulic pulse drive mechanism and the organic centrifuge bowl and case alterations for liquid-liquid-solid separation. A drawing schedule was issued by the Design Section showing a total of 55 drawings to be completed by November 20, 1953.

URANIUM RECOVERY PROCESS TECHNOLOGY

TANK FARMS-FEED PREPARATION AND WASTE HANDLING

Metal Removal

Approximately 3500 gallons of stored metal waste per ton of metal processed were removed by supernatant sluicing, water sluicing and direct transfer of supernatant. Water sluicing increased the volume of feed by approximately 1820 gallons per ton of uranium.

Feed Preparation

Routine acidification of the above feeds required about 12,500 pounds of 100 per cent nitric acid per ton of uranium. An average boiloff of 47

volume per cent in the 221-U concentrators gave a feed of the following average composition to the solvent extraction batteries:

	Components M (a)					
	U	SO_4	PO_4	HNO_3 (b)	Na	$K^{1/2}$ (c)
Feed	0.21	0.18	0.225	2.9 (d)	2.8	3.5 to 5.7
HW #4	0.27	0.26	0.26	2.6	4.06	5.5

(a) Balance of anion is NO_3^-
(b) Titratable, includes $2H^+$ from $SO_4^=$, 2 H^+ from $PO_4^=$.
(c) Not an average. Range is shown to indicate variation.
(d) The titratable HNO_3 is above the 2.6 M even with lower than HW #4 values for PO_4 and SO_4 because additional acid was added to the dilute feed to avoid uranyl acid phosphate precipitation with the high uranium concentrations (0.7 lb./gal.) used when Redox rework was blended with tank farm feed.

Only about 25 per cent of the concentrated feed was centrifuged before solvent extraction processing.

Waste Handling

Approximately 4200 gallons of concentrated neutralized waste was returned to underground storage for each ton of new uranium processed equivalent to about 120 per cent of the volume removed, and contained 4.8 per cent of the virgin feed uranium. Neutralized waste pH was routinely controlled between 8 to 9. Waste concentration was carried out to a specific gravity of 1.40 (80 C) with an average clear point of 25 C until August 13, when the specific gravity was reduced to 1.37 (80 C) to decrease the possibility of plugging the cross-country line during transfers to East Area. Clear points averaged 18 C under the latter conditions while the minimum cross-country waste line temperature was 20 C.

Chemicals for the planned test of nickel ferrocyanide scavenging of 221-U "Hot" waste may be received about September 20th. A tentative operating procedure is written, issuance pending further laboratory studies.

SOLVENT EXTRACTION

Operating Conditions

The uranium processed by the solvent extraction batteries was 82 per cent of the nominal design capacity. Total input included 21 per cent Redox rework and six per cent rework from 221-U and 224-U Buildings. The overall solvent extraction loss was 3.0 per cent of the total feed uranium or 4.1 per cent of the virgin feed uranium. Essentially HW #4 TBP Flowsheet conditions were employed using 20 volume per cent TBP-hydrocarbon diluent extractant. The dual scrub type RA Column using demineralized water as the top-end scrub (RAS) was used all through the report period in the "A" Line and during the latter portion on "B" Line.

General Performance

Average performance data* are:

	A Line	B Line
Losses, Per Cent of Feed Uranium		
RAW	2.7	2.8
RCW	0.3	0.4
ROW (RCW-ROO)	0.2	0.3
RCU Activities		
Beta, Per Cent of aged natural uranium	109	137
Gamma, Per Cent of aged natural uranium	215	225*
Pu, Parts per billion parts of uranium	5	5
Logarithmic Decontamination Factor, dF		
Beta	3.4	3.4
Gamma	3.7	3.9
Pu	2.3	2.2

* Including processing of 2.7 to 3.5 year old feed from TK-101-BX.

"B" Line fission product dF's were generally equal to or greater than those for "A" Line; however, since B Line was used for processing 10.6 ton of uranium from TK-101-BX (minimum age ca. 2.7 years since pile discharge) the average product activities were slightly higher. After the introduction of this "Young" feed into the system, the beta and gamma dF's of the RCU decreased rather consistently from 3.7 to 3.0 and from 4.3 to 3.0, respectively, varying inversely as the ROO (RAX) activity which increased from 2.0×10^7 to 1.4×10^8 beta counts per minute per gallon and from 60 to 360 gamma microcuries per gallon. RAX changes gave some slight improvement in decontamination which lasted one or two days, system flushes produced considerable improvement of slightly longer duration. The gradual deterioration of the operation between flushes indicates that the probable cause is a build-up of crud and emulsion causing gross channeling in the RA Column. The sodium content of the RCU was generally high, reaching a maximum of 500 parts per million parts of uranium about the middle of the report period. The cause of this is also thought to be emulsification and channeling, particularly in the RA Column scrub sections.

A production test in which 10.6 tons of RAF prepared from TK-101-BX with a minimum age of ca. 2.5 years was processed at 100 per cent of the nominal design rate required two-cycle operation to obtain the required fission product decontamination. The B Line equipment operated as the first cycle using a single point scrub RA Column and RAS at HW #4 TBP Flowsheet composition.

The beta and gamma activity of the first cycle RCU averaged 520 and 640 per cent of aged natural uranium, respectively, and was recycled without concentration through the "A" Line which used a dual scrub RA Column with the intermediate scrub at the same flow rate and composition as the "B" Line RAS and a demineralized water scrub stream at 25 per cent of this flow rate at the top of the column. The gamma activity of the second cycle product averaged 52 per cent of aged natural uranium and the beta activity decreased gradually from 39 to 3 per cent aged natural uranium.

Solvent Treatment RO-Column Performance

Solvent treatment procedures employed were successful in gradually reducing the solvent's residual gamma activity six-fold from about 360 to 60 gamma microcuries per gallon. The RAX in each solvent extraction line was replaced with freshly washed material about three times weekly. Batch treatment procedures included two five weight per cent sodium carbonate (unheated) washes, two three weight per cent sodium carbonate washes (heated to 50 C), and a single hot (50 C) three weight per cent sodium carbonate wash. No significant improvement in the solvent quality can be attributed to a particular batch treatment, since the decrease in solvent gamma activity was gradual. The single hot carbonate wash appeared as effective as two washes. Currently, the solvent batch treatment used on TBP hydrocarbon diluent mixtures at ORNL and KAPL is being tested; this includes a hot (50 C) one weight per cent sodium hydroxide wash followed by two weight per cent sodium sulfate, and finally one weight per cent nitric acid. Results are encouraging in that a further two fold reduction in extractant gamma activity has been achieved.

RO Column scrub solution (ROS) was 2.5 weight per cent sodium oxalate until August 1 when the use of five weight per cent sodium sulfate was resumed. No change in in-line solvent quality was observed. Increasing the ROS flow by 50 per cent gave a slight improvement in RO Column decontamination factors for uranium and fission product activity. RO Column scrubbing removed above 70 per cent of the uranium from RC Column organic effluent (RCW).

Equipment

Scheduled shut-downs of 12 hours for A Line and 20 hours for B Line were required to replace pulse generator ACA motor brushes.

The product (RCU) continuous gamma monitor, installed on A Line, gave satisfactory performance for extended periods of time after a glass sample cup was installed. Both stainless steel and "Tygon" painted cups were unsatisfactory because of high background build-up.

The RAF uranium continuous monitor operated satisfactorily until external nitric acid fumes caused failure. It is to be reinstalled soon, protected from external fumes.

The RAW continuous uranium monitor failed due to leaky solenoid valves, and redesign is being studied.

The 216-U crib which receives organic wash solution and building sumps appeared to be plugging, but this condition is gradually improving. Laboratory tests are underway to determine a suitable solvent for interface crud which is believed to be the major source of pluggage. Hydrogen peroxide looks promising at present.

URANIUM PRODUCT PROCESSING

Summary

During the month calcination operations produced UO_3 containing ca. 82 per cent of uranium processing design capacity. This total production was composed of 76 per cent TBP and 24 per cent Redox source uranium. The low production total resulted principally from a lack of both TBP and Redox source feed.

Total metallic impurities in carload UO_3 composites shipped ranged from 95 to 735 parts per million parts of uranium with an average of 282 parts per million parts of uranium. Average total metallic impurities in the UO_3 produced during the month of July was 188 parts per million parts of uranium. The increase in impurity content of product may be ascribed, in part, to the reduced fraction of Redox source uranium. Plutonium and beta specifications were not exceeded; however, 15 per cent of the product (one carload) contained fission product gamma activity in excess of 100 per cent of the gamma activity of aged natural uranium.

UNH Processing

The stripper demonstrated satisfactory performance when supplied with vapors from Primary Concentrator E-B-1 at sufficiently high (G 0.4) steam-to-feed ratios. For this mode of operation, less than 10 parts TBP per million parts of solution remained in stripper bottoms; however, when the auxiliary steam supply was used (E-B-1 shut down), TBP in stripper bottoms ranged from 18 to 22 ppm, which resulted in moderate foaming during the calcination operations.

A test was conducted during the report period to evaluate the effect on the process of single, 60 per cent UNH concentrator operation. The following conclusions were made on the basis of the test results:

1. E-B-1 operation alone gave a three-fold higher HNO_3 concentration in the 60 per cent UNH effluent.

2. E-B-1 operation alone gave a 50 per cent higher Fe, Cr, and Ni pick-up.

3. Use of auxiliary steam to T-B-4 resulted in a 100 per cent increase in the TBP content of stripper bottoms.

4. Poor stripper efficiency, when using auxiliary steam, was eventually discovered to be caused by steam-to-feed ratios less than 0.4, or below the demonstrated minimum for adequate TBP removal.

One month after the second HF flush of the 10 per cent UNH Concentrator, E-D-2, the over-all heat transfer coefficient was holding at about 130 B.t.u./(hr.)(ft.^{2})(°F.), which is approximately 30 per cent higher than for a similar period in connection with the first HF flush. Reasons for this capacity improvement were believed to be (1) longer HF residence time, hence better scale removal, and (2) the maintaining of a lower specific gravity in the concentrate, less than 2.48 instead of 2.50 to 2.60.

UO_3 Conversion

Pot room production ranged from 17 to 133 per cent of instantaneous design processing capacity. The period of low production resulted from lack of feed. Calcination pot charges averaged 89 per cent of nominal charge.

Maximum pot room production is presently limited by collection of UO_3 cake on the agitator blade. Prevention of cake collection by coating the agitator with a non-wetting agent had been attempted without success during the early phases of UO_3 Plant operation; cause of failure can be ascribed, in part, to the lack of resistance of most hydrophobic coatings to the extreme conditions of temperature, fumes, and abrasion encountered in the calcination pots. Cake removal by use of an air-powered chipping hammer and an electric hammer was tested, but both proved inefficient as well as awkward to handle. Modification of agitator design would appear to be the most practicable solution to the problem, and two agitator design considerations have been proposed.

(1) Removal of the lower scraper blade reinforcing member to present less compartmentation for cake support, and

(2) Removal of both reinforcing members and installation of a flat, vertical plate for strength, thereby essentially eliminating compartmentation, and providing easy access for cake removal by mechanical means (pneumatic unloading nozzles).

WASTE EVAPORATION - B AND T PLANTS

Operations at B Plant were directed toward completing general repairs to the evaporator facilities, replacing the leaking steam coils in the evaporator, and repairing a leak in the steam condensate line between the evaporator and the retention basin.

The waste evaporator at T Plant operated on neutralized RAW material from tanks 107, 108, and 109-T. Approximately 486,063 gallons of feed were processed into 243,375 gallons of concentrate and 262,095 gallons of condensate for a supernatant waste volume reduction of 50 per cent.

[redacted]

plant, are responsible for the abnormal amounts of sodium in the recent TBP Plant recovered uranium. An attempt was made in the laboratory to reduce the contamination in the RCU by means of filtration. The accompanying slime and solids were efficiently removed by filtration through either glass wool or filter paper, but no change in metallic impurity content of the RCU accompanied this improvement in physical appearance.

Uranium Concentration: Silica in Demineralized Water - The RCX currently used in TBP Plant (Building 221-U) operation contains about 8 to 10 ppm silicon which is believed to be at least partially responsible for the scale found on the uranium concentrator tubes. This scale has greatly reduced the heat transfer coefficient (by a factor of 2 to 3) with the result that the E-D-2 (secondary) concentrator is now one of the most important factors limiting production rates. The demineralizer currently used is a weakly basic anion exchange resin (Chempro 47). Preliminary laboratory work has shown that IRA-400, a strongly basic exchanger, will produce demineralized water containing less than 1 ppm silicon. However, plant throughput rates have not as yet been attained. Other exchangers as well as higher throughput rates are to be investigated.

REDOX PROCESS TECHNOLOGY

Summary

The Redox Plant was shutdown from July 29 to August 8 for replacement of the H-2 Centrifuge, flushes of the extraction columns, and other maintenance requirements. Operation for the remainder of the month was with the $KMnO_4$ Head-End oxidation of IAF, three Uranium Cycles, and three Plutonium Cycles. Process performance during the month was characterized by low uranium decontamination factors (which gradually improved during the period) and normal plutonium decontamination factors. With the exception of short periods during the month, uranium and plutonium losses were normal. During short periods of uranium rework, a production rate of 200 per cent of the design calendar day rate was maintained; otherwise, for most of the month a production rate of 240 per cent of the calendar day design rate six tons of uranium was maintained until a rate of 280 per cent of design rate of uranium was satisfactorily attained on August 24.

Process Performance

The solvent extraction performance for uranium decontamination during the month has been peculiar, with evidence of cross-contamination and the presence of small quantities of extractable zirconium-niobium in the Uranium Cycles; thus, operation of three uranium cycles was necessary. With the exception of operation immediately following start-up, decontamination of plutonium product has been normal. In addition, both plutonium and uranium losses have been excessive (two to three per cent) for short periods, but for the majority of the month they have been normal.

Although the elimination of the suspected variables was made on a step-wise basis, the decrease in uranium activity during the month was gradual and could not be definitely attributed to a specific variable. The following items most of which are still under investigation, list in brief summary, without establishing which items are the most significant factors, what is currently known about the probable causes for poor decontamination:

1. Displacement of IS and IA Column interfaces resulted in the contamination of second cycle feeds with activity (primarily zirconium-niobium) from interface solids accumulation. During the 60 per cent HNO_3 acid flush of the IS Column on July 31, apparently excessive sparging in the column caused approximately 50 gallons of aqueous flush solution to overflow to the IB Column, forcing a similar volume of IBX (and the IB Column interface) to overflow to the IC Column.

2. Prolonged storage (ten days) of unoxidized dissolver solution (due to the extended shutdown caused by difficulties in the H-2 Centrifuge installation) may have had a deleterious effect on fission product behavior during subsequent processing.

3. Use was made of the new dissolving technique (described last month) in which acid is added continuously to the dissolver during the latter part of the dissolution. Plant data obtained at the end of July and during August indicate that this cause is partially responsible; in addition, laboratory data indicate that the uranium decontamination from zirconium-niobium suffered with this dissolving.

4. Absence of sodium hydroxide from the acid deficient aluminum nitrate scrub solutions may be responsible for the loss in First Cycle decontamination observed since July. Use of sodium hydroxide in the IAS and ISS has been made for a short period at the end of the month, and some benefit may have been realized.

5. Revised 2D and 3D Column flowsheets using 2.5 M UNH (vice 2.0 M UNH) in the feed has possibly had an effect, but recent plant data do not indicate this. However, there has been some evidence of entrainment of activity in the 2DU solution.

6. Revised Head-End treatment procedures utilizing reduced potassium permanganate concentrations and the "catalytic kill" technique (for residual permanganate after oxidation) may have resulted in an unexpected effect.

No significant differences have been noted in either uranium or plutonium decontamination when operating at rates of seven tons of uranium per day as compared to rates of six tons of uranium per day.

An excessive plutonium loss for a short period at the start of the month is attributed to the prolonged storage of unoxidized dissolver solution and the resultant formation of an inextractable species. An excessive uranium loss for short periods has occurred during transition periods when the 2D and 3D Column flowsheets were being changed.

Feed Preparation

The procedure of dissolving 4.95 tons of uranium in two cuts was continued. The uranium in these charges had an average pile exposure of 567 (471 to 594) MWD/T. The average age of IAF batches prepared was 89 (85 to 92)days. All batches were oxidized by the Potassium Permanganate Head-End Oxidation procedure for volatilization of ruthenium and partial scavenging of zirconium-niobium on manganese dioxide. A new step was introduced into the procedure which involved the catalytic reduction of residual potassium permanganate (following oxidation) with chromium(III) nitrate so that subsequent partial dissolution of manganese dioxide could be more uniformly controlled. Although the effectiveness of this reduction is difficult to observe, it has been assumed to be successful.

Evaluation of potassium permanganate requirement for ruthenium volatilization, oxidation time, and amount of scavenging obtained was continued throughout the month; however, limitations on the frequency of changes were necessary in order to study the effect of other variables on decontamination in the columns. The average results are summarized below:

IAF Batch No.	$KMnO_4$, M	Oxidation Time, Hours	Estimated MnO_2 Scavenging, M	Ru	Gamma
2 - 5	0.005, 0.013	2	0.01 - 0.018	4.3 (4)	1.6 (4)
6-9, 14-28	0.01, 0.02	2	0.003 - 0.01	13.9 (6)	2.1 (18)
11 - 13	0.01, 0.02	1	0.003 - 0.01	7.5 (1)	1.5 (3)

Note: Numbers in parentheses indicate the number of analyses represented in the average.

Interpretation of the data is complicated by the possible effects of prolonged storage of unoxidized metal solution (Batches 1-6), variable centrifuge feed rates, and the probability of bowl skimming to the centrifuged feed because of a faulty H-2 Centrifuge to H-4 Oxidizer jet (replaced after Batch 19). However, it appears that oxidation time and potassium permanganate concentration have an appreciable effect on the ruthenium decontamination factor and may affect the gamma decontamination factor. The H-4 Oxidizer batch size was increased from 3.5 to 3.75 tons of uranium on Batch 9 in order to increase the Head-End capacity (without G-5) from 6.9 to 7.4 tons of uranium per day.

The H-2 Centrifuge was replaced with the spare during the shutdown at the first of the month. Five jumper failures on the original H-2 Centrifuge (H-4 to H-2 jet, plow hydraulic line, tachometer electrical leads, power jumper bracing, and the weight factor) apparently were the result of excessive vibration, presumably during start-up due to unbalance caused by a partially filled bowl. Current time cycles permit cake removals only after three batches. In order to prevent the excessive vibration during bowl start-up, the centrifuge is kept running at 870 r.p.m. between batches not involving cake removal.

[redacted]

The H-4 Oxidizer coil failed on August 21 as indicated by high Beckman readings at the Retention Basin. It was necessary to revise the permanganate oxidation step to use an 80 C sparge temperature.

Uranium Extraction and Decontamination

In general, nominal conditions of the ORNL June, 1949 (acid-deficient) Flowsheet were employed for the First Extraction Cycle. The Second and Third Uranium Cycles are currently being operated at a near-maximum rate of seven tons of uranium per day on the 2.45 M UNH feed flowsheets described last month.

Because of the loss of uranium decontamination described previously, two E-12 Batches were reworked through the Uranium Cycles. In addition, eight E-12 Batches were shipped to the Metal Recovery Plant for rework through the RA Column.

The original F-8 (ISF) pump failed on August 14 after approximately one year of continuous service. A jumper connecting the F-7 (IAF) pump discharge (via a spare nozzle) to the ISF flow control instrumentation was installed on August 15, and the IA and IS Columns have been operated in parallel since then. The spare deep-well turbine pumps are expected in mid-September.

The Plutonium Cycle solvent extraction performance has been excellent, and no flowsheet changes have been tested. Recommendation has been made that the Phase II 2A and 2B Columns not be purchased because of the satisfactory performance of the present columns during a brief test at ten tons of uranium per day.

Waste Processing

The D-8 (Waste Neutralizer) Pump failure on July 26 was apparently a failure of the motor connection rather than the jumper. A replacement pump is expected in mid-September.

Self concentration of wastes in 241-S Tank Farm was started on August 20 in Tank 104 when the new condenser (modified Off-Gas Caustic Scrubber) was installed. Initial condensate rates of approximately 2.5 gallons per minute were achieved, and the current rate is approximately 0.9 gallon per minute.

PROCESS CHEMISTRY

Solvent Extraction - Redox Plant startup following a two week shutdown was characterized by high gamma activity in the final uranium product (E-12) despite the use of permanganate head-end and three solvent extraction cycles. Several possible causes were investigated in the laboratory, as discussed below.

Dissolving and Feed History - The effect of dissolving conditions used in the plant on subsequent solvent extraction was checked by laboratory batch contacts. Solutions were prepared from samples of plant dissolved metal resulting from 1) conventional acid addition technique, and 2) from the newly developed

continuous acid addition technique. The data indicate that both Zr-Nb and gross gamma decontamination factors are improved by conventional dissolving. This method is now being used again in the plant.

Portions of the samples used in this experimental work are now being stored in the laboratory, and contacts similar to the above will be made in 2 or 3 weeks to determine the effect of storage time on subsequent solvent extraction behavior of these same feed solutions.

Second Uranium Cycle - Batch contacts were also made to determine: (a) if the second cycle feed, 2DF, (abnormally high in gamma activity) contained "extractable" fission products, (b) if the solvent being used in the plant was the cause, and (c) if the 2DF uranium concentration could safely be increased from the nominal 2M to approximately 2.5M. The studies indicated normal 2nd cycle decontamination factors for this off-standard 2DF, and showed that the solvent being used was acceptable.

Activity in Uranium Product - The high gamma ratio of concentrated 3EU solution (E-12) was determined not to be the result of low density solids that might have been carried through the columns by an operational error (e.g., displacement of interfaces). A sample with a gamma ratio of 10.3 was diluted ten-fold, centrifuged for 10 minutes at 1000 times gravity and analyzed. No reduction in gamma activity was noted.

Z PLANT - ISOLATION, PURIFICATION AND FABRICATION

Isolation Building (Task I)

It was recommended that up to four grams per liter of aluminum, as aluminum nitrate, be added to each F-10-P run so that the fluoride-ion would preferentially form soluble complex ions with aluminum rather than with plutonium. The limit of four grams per liter is set by conditions in the Concentration (224-T) Building wherein excessive aluminum would cause increased waste losses since the supernatant solutions from the peroxide process are recycled to that building. Approximately three grams of aluminum per liter were added to the following runs and the recycle plutonium was lower as indicated:

Run No.	Per Cent Recycle
T-53-8-DR-3	7.8(1)
T-53-8-DR-4	4.1(1)
T-53-8-MRC-14	7.6(2)
T-53-8-MRC-15	8.9(2)

(1) Regular T-Plant runs have averaged about 8 per cent recycle.

(2) Master Recycle T-Plant runs have averaged about 12 per cent recycle.

Plutonium(IV) Oxalate - Post-Precipitation Test

Samples of oxalate filtrates from several plutonium(IV) oxalate - filter boat runs were tested for precipitation of plutonium after filtration to determine if this is the cause for solids being in the vacuum head tanks. The results show that there is insignificant post-precipitation. Evidently the solids reach the vacuum head tanks almost entirely by mechanical means through leaking filter boats and in-line filters which emphasizes the need for a routine boat repair program.

Fluorination (Task II)

Based on fluoride color 18.6 per cent of the regular cycle runs required refluorination. This is comparable to 23.4 per cent and 21.4 per cent in July and June, respectively.

Testing of modifications to the fluorination cycle have continued with a thermocouple imbedded in the oxalate cake. Significant time cycle reductions have been shown possible by increasing the initial baffle temperature and by reducing the hold time at 600 C. On the basis of experiments performed with the thermocouple measuring the cake temperature, two furnaces were equipped with controller cams for the following cycle: Heat to 500 C, hold for one hour, heat to 600 C, hold for 30 minutes and cool. The hydrogen fluoride-oxygen mixture is admitted 45 minutes from the start of the cycle and turned off when the furnace has cooled to 250 C. Refluorination rate with this cycle has been comparable (19 per cent of 16 runs) to the standard cycle on one furnace (No. 1) and high (75 per cent of 8 runs) on the other (No. 4). Four runs in which the furnace was heated directly to 600 C and held for 45 minutes and the hydrogen fluoride admitted 50 minutes after the start of the cycle have yielded predominantly green fluorides. On the otherhand, a pink fluoride was obtained on a cycle involving heating to 500 C, cooling for 30 minutes, heating to 600 C, holding 30 minutes and cooling. The hydrogen fluoride-oxygen mixture was introduced 50 minutes after the start of the cycle. In an attempt to eliminate the cake temperature surge normally obtained when the hydrogen fluoride-oxygen is admitted, one run was performed admitting the hydrogen fluoride at 250 C and the oxygen when the cake temperature reached 600 C; however, the cake temperature rose rapidly, 450 C degrees in 12 minutes upon adding the hydrogen fluoride.

The "Hypalon" (a chlorosulfonated polyethylene) gaskets being tested have given encouraging results. This material had not become brittle after four runs but had become flattened under heat and pressure. Two runs are realized from the butyl rubber gaskets presently in use.

The retort of furnace No. 5 failed at the weld of the Hastelloy "C" body and the Z nickel flange for the third time. This is the first furnace failure for ca. two months.

Thickness measurements of the stainless steel D-6 drain line which receives the hydrogen fluoride gas in water from Task II indicate that no corrosion is taking place in the line. An audiogage was used to make the thickness measurements.

Reduction (Task III)

The average reduction yield for this period was 94.1 per cent as compared with 95.8 per cent and 96.2 per cent for June and July, respectively. The use of 70-58 oxide in the place of metallic 70-58 was resumed during a part of the month.

Crucible Shop Activities

Castings made in CD-1101 crucibles recently received from the vendor have again shown excessive "sticking" to the crucible. Crucibles prepared and fired to 1850 C in the crucible shop and the off-site crucibles re-fired to 1850 C did not cause this sticking. It is possible that the crucibles from the vendor were under-fired (< 1750 C), or that a higher firing temperature must be specified (1850 C). Firing temperatures will be resolved after a batch of off-site crucibles, refired to 1750-1775 C, are tried in the production line.

234-5 DEVELOPMENT

Plutonium(IV) Oxalate Precipitation

The process difficulties which were recently encountered in the 231 Building (formation of "milky", plutonium(IV) oxalate precipitates which could be filtered only with difficulty), have led to a renewed study of the oxalate process, with emphasis upon the evaluation of the effect of strike temperature, agitation, and the presence of certain organic compounds which might act as complexing agents. In the experiments performed to date, 1) a strike temperature of 50 C gave the most rapidly-filtered precipitate; 2) a strike at 80 C produced a gummy precipitate which filtered slowly; and 3) the addition of 0.06 M oxalic acid prior to the valence adjustment with hydrogen peroxide resulted in doubled pre-reduction time and slower filtration.

Experimental, Task I Precipitation Vessel

Operation of the experimental, Task I precipitation vessel with various impellers (three-blade propeller, Archimedes Screws, and centrifugal pumps) has shown that, while adequate circulation can be produced by any of the three types of impeller, the use of the propellers offers the advantages of less wall friction, less tendency for precipitate to adhere to the agitator surface, and no packing of precipitate between the draft tube and the agitator.

Continuous Fluorination

Calculation of its operating characteristics has shown that the rotating kiln type reactor (2-1/2 inch I.D. by eight feet), proposed for evaluation as a

continuous fluorinator for PuO_2, will give the desired residence times of 20 to 80 minutes over a wide range of reactor rotational speeds and degree of tilt. Calculation of bed dynamics for a fluidized bed reactor offer less hope, since they indicate that in a 2.5 inch diameter tube, the static bed depth required would be between seven and 92 inches, depending on the degree of conversion required and on the assumed batch reaction time. Satisfactory operation might require the use of a number of reactors in series (to reduce the total bed content and the depth of each individual bed) or in parallel (to reduce the gas velocities required and consequently the entrainment).

Direct Fluorination of Plutonium(IV) Oxalate

A fluorination procedure in which the hydrogen fluoride-oxygen stream is admitted to the furnace from the start of the heating cycle, thus exposing the damp oxalate cake to hydrogen fluoride, has been tried and found to give PuF_3 at 300 C, PuF_4 at 600 C. The powders, which had bulk densities of 1.7 to 1.9 g/cc PuF_4, contained soft, easily-broken lumps.

Reduction of Off-Standard Fluorides

A second plant batch of "blue" fluoride powder, presumed to be largely PuF_3, was reduced in the laboratory reduction hood, using the standard weight of iodine for this weight of powder. A poorly formed slag and a rough button resulted, with a metal yield between 92.9 per cent (PuF_3 basis) and 98.7 per cent (PuF_4 basis).

Laboratory (40 grams) reductions of two samples of a gray-green powder (Pu:F = 1:2.5) gave poor yields, 36.7 and 66.8 per cent, respectively.

Destruction of Oxalic Acid in Oxalate Supernatants

Studies of the oxidation of 0.1 M $H_2C_2O_4$ in 3.5 M HNO_3 solution have shown that:

1) using permanganate as the oxidant, the initial reaction rate increases rapidly with temperature up to 30-40 C, but shows little increase above 40 C; and 2) with 0.0003 M Mn^{++} as a catalyst, two per cent ozone gives an almost quantitative reaction at room temperature. The low ozone concentrations produced by commercial ozonizer, however, would require the passage of such large quantities of air that the procedure is impractical for use in Task I equipment.

Life Test of Kel-F Coatings on Stainless Steel, Recuplex Pulse Column Plates

Examination of the set of eleven compound plates, fabricated at Hanford, which have been tested for three months under conditions simulating those at the feed plate in the Recuplex CA column, has shown that two very small sections had peeled loose at the edge of one of the plates. A somewhat larger section (1/8 sq.in.) was found to have peeled on another plate at the end of the first month's testing.

Distribution Data for Uranium - Recuplex Flowsheet HW No. 10

Extraction coefficients for uranium and nitric acid, for Recuplex Flowsheet HW No. 10 (15 per cent TBP in CCl_4), were obtained in a batch, counter-current extraction apparatus, and agree satisfactorily with published data for uranium extraction and stripping in a system using 15 per cent TBP in a hydrocarbon diluent.

Stability of Hydrogen Peroxide

Concern over the possible decomposition of hydrogen peroxide in contact with stainless steel prompted a series of tests in which it was found that in the presence of passivated 304 ELC stainless steel, the rate of decomposition of either 12-1/2 or 50 per cent H_2O_2 was increased less than 100 per cent, while in the presence of activated stainless steel, the rate was increased only 500 per cent. All decomposition rates were small.

Materials Testing - Chemical Resistance of Homalite

Laboratory tests of Homalite for possible use in transparent hood panels have been made. The samples tested had excellent resistance to common organic solvents, but poor resistance to 37 per cent HCl, 70 per cent HNO_3, and 95 per cent H_2SO_4. Exposed to the vapors above 70 per cent HNO_3 at room temperature, the sample became quite yellow within 18 hours.

234-5 PROCESS RECOVERY - RECUPLEX

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 21 per cent completed. The relocation of Hood 40 service and instrument piping has been completed. Floor preparation for the process hood pans, and the installation of the underground lines for the disposal of the CAW and silica slurry waste streams have commenced.

P-10 PROCESS STUDIES

Liaison with Los Alamos Scientific Laboratory has revealed that product specifications may be considerably relaxed without detriment to the operational sequence in the customer facilities. In consideration of the simplified operation, decreased operating cost, increased throughput and yield possible at this site if less stringent specifications are adhered to, concerted efforts are being made to establish mutually acceptable specifications permitting accomplishment of potential gains.

Measurement of the radiation from irradiated "N" type target slugs was completed as were calculations of the radiation intensities to be expected at various operational points in the process. Design changes incorporating the use of more shielding have been made which will permit reasonable radiation levels despite the 25 fold greater emission from "N" type versus "P-10A" type slugs.

ANALYTICAL LABORATORIES

Fission product analyses accounted for the bulk of the "active" work. About 25 per cent of all individual fission product determinations were performed by use of the Gamma-Ray Energy Spectrometer, including Ce-Pr-144, I-131, Sb-125, Ru-Rh-106, Cs-Ba-137 and Nb-95. Since the spectrometer does not distinguish between Zr-95, 0.721 Mev., and Nb-95, 0.745 Mev., the Nb-95 determination was accomplished by combining chemical separation and spectrometer measurement. Such a method resulted in an overall 75 per cent reduction in operator time for the determination of Nb-95.

The Spectrochemical Laboratory continued to support the 300 Area Metal Preparation process during the month. Arrangements were completed for transferring the spectrochemical control functions to the Manufacturing Department as of September 1, 1953. Lead in the Al-Si canning baths was determined in control of the lead dip production test from July 27 to August 13. Spectrographic control on incoming slugs from Fernald has been reduced to the determination of B, Cr, Fe, Ni, Mn, and Si.

The Special Analytical Laboratory performed analyses in connection with a number of plant problems and investigations. The cadmium content of a gold-cadmium alloy was successfully determined by a flamephotometric method, as was the lithium content of a lithium-aluminum alloy.

The Water Quality Laboratory continued to support the programs of Water Plant Development and Pile Coolant Effects. The oxine method for the determination of Al has been successfully checked on synthetic water samples. It has been determined that the level of dichromate in pile water interferes. A solution to this interference is being sought.

The Mass Spectrometer Laboratory is on schedule for the start of the P-10 program. The spare source for the Consolidated-Nier Spectrometer has been assembled, installed and checked, and it appears to be functioning satisfactorily. The vacuum system has been overhauled and the diffusion pump to the sample manifold replaced. A new cold line for preparing standard gas samples has been constructed and a supply of pure gases are on hand. Training of shift chemists has been started and Standard Operating Procedures are being prepared.

Work volume statistics for the Analytical Laboratories are as follows:

	July		August	
	Number of Samples	Number of Det'ns.	Number of Samples	Number of Det'ns.
Research and Development				
Applied Research	1511	3926	1048	2609
Pile Technology	277	663	358	1507
Fuel Technology	85	1619	112	2840
Separations Technology	314	649	1012	1158
Process Control	550	2240	356	835
Others	107	1134	82	691
Total	2844	10231	2968	9640

Standards and Calibrations	July	August
Number of standard solutions prepared	18	30
Stock solutions dispensed	62	97
Number of calibrations performed	879	1
Number of calibrated glassware dispensed	57	34
Number of checked glassware dispensed	60	233
Total	1076	395

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.

V. R. Cooper

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

September 11, 1953

VRC:bp

[redacted]

September 10, 1953

APPLIED RESEARCH SUB-SECTION

August, 1953

VISITORS AND BUSINESS TRIPS

C. L. Schuske and B. Weidenbaum, Rocky Flats, Colorado Plant, Dow Chemical Company, visited Hanford on August 3-5 to discuss critically safe vessel design.

K. H. Gayer, Wayne University, Detroit, Michigan, was here August 28 to discuss mass spectrometry.

[redacted]

Applied Research Sub-Section

E. K. Hulet and R. Carr, Radiation Laboratory, University of California, Berkeley, spent August 10-27 discussing the processing of irradiated samples of intersite interest.

F. A. White, Knolls Atomic Power Laboratory, Schenectady, was here August 17-21 to discuss cross section measurements and mass spectrometry.

C. Gotezin, Air Reduction Sales Corporation, Seattle, was here August 19-20 discussing the welding shop floor plan.

D. C. Kaulitz visited the Phillips Petroleum Corporation, Arco, Idaho, on August 10-12 to discuss the design of MTR test facilities.

R. H. Moore attended the Gordon Research Conference in New Hampton, New Hampshire, on August 10-14; August 17 was spent visiting the Perkin-Elmer Corporation, Norwalk, Connecticut, for discussion of inorganic infrared spectrophotometry; and August 18-19 was spent at Knolls Atomic Power Laboratory, Schenectady, discussing infrared monitoring of radiation damage.

ORGANIZATION AND PERSONNEL

Personnel totals as of August 31 were as follows:

	Exempt	Technical Graduates		Non-exempt	Total
		Permanent	Rotational		
Physics Unit	24	2	2	8	36
Metallurgy Unit	42	3	2	24	71
Chemistry Unit	49	1	2	16	68
Equipment Design	6	-	-	3	9
Administration	2	-	-	5	7
Total	123	6	6	56	191

Three summer program employees not included in totals.

PHYSICS UNIT

Lattice Physics

For some time a discrepancy has existed between the value of η (equal to 1.34 ± 0.02), which is obtained by direct combination of cross sections, and the value (equal to 1.296) resulting from exponential pile measurements. This discrepancy has now been shown to arise from the fact that the thermal neutron energy spectrum shifts to higher energies as the neutrons move into the interior of a piece of uranium. The shift in energy has been calculated at the slug axis for a Hanford 7 1/2 inch lattice. The combination of this result with experimental cross-section curves shows a decrease in η at the slug axis of 6.9%. If the effect of the energy shift is assumed to depend on the square of the radius,

then an average decrease of η of 3.2% over the slug is obtained, thus agreement between the two values is obtained within the experimental error.

A new method has been devised for calculating the inverse diffusion length of thermal neutrons, $\mathcal{K}$, in uranium. This method is a modification of the Serber-Wilson technique for solving problems in transport theory. In the Serber-Wilson method, one assumes that the functional forms of the diffusion theory are correct for highly absorbing media, but that the boundary conditions are not proper. One then sacrifices the conditions of continuity of neutron flux at the interfaces between different media, and requires instead that the exact transport equation be satisfied at the point of greatest geometric symmetry. For the case of a cylindrical fuel element imbedded in graphite, this point would lie on the slug's axis. If one applies the Serber-Wilson method to this case, large discontinuities in the flux are found at the slug surface. Since the actual flux must be continuous throughout, the method therefore exhibits large errors and is clearly inapplicable in this case. The method is now modified in the following way. An integral expression is written down for the flux on the axis of the slug and the diffusion theory solutions are substituted under the integral sign; the equation is then satisfied by varying the value of $\mathcal{K}$. In this way both the exact integral equation and the boundary conditions of continuity of flux at the boundary are satisfied. The value of $\mathcal{K}$ thus obtained is the best, consistent with an I_0 flux distribution within the slug. Trial calculations for the Hanford 7 1/2 inch lattice have been performed and a value of $\mathcal{K}$ (= 0.79) has been derived, in excellent agreement with experiment. These calculations will be extended to show the effect on $\mathcal{K}$ of enrichment, slug size, and lattice size.

There is no experimental method for measuring the diffusion length of neutrons in a multiplying lattice. For this reason, a detailed expression for the diffusion length has been worked out involving the appropriate parameters of the lattice. This expression is used to calculate the diffusion length in absorbing lattices, where the diffusion length can be measured. If satisfactory agreement with experiment is obtained, it can then be employed to compute the diffusion lengths in multiplying lattices. A full report on this topic has been written.

The final draft of a paper entitled "On Indefinite Integrals of Functions Satisfying Homogeneous Linear Differential Equations" has been prepared and will be submitted for publication by the Americal Mathematical Society. This paper deals with mathematical problems encountered in the diffusion theory of neutrons.

Mechanical difficulties were encountered in the loading of hollow slugs into the 7 1/2 inch lattice. These have now been overcome and experimentation has started. The dimensions of these slugs are 0.810 I.D. and 1.660 O.D. It is expected that two to two and one-half months will be required to complete wet and dry measurements in the 6 3/16 inch, 7 1/2 inch, 12 3/8 inch and 15 inch lattices. The latter two measurements give extreme points on the curve and are taken to check theory.

Applied Research Sub-Section

Flux distribution measurements were made in an array of 250 enriched uranium slugs in the 7 1/2 inch lattice with a graphite reflector only. It is hoped to obtain the reactivity of this enriched lattice from these measurements.

Preliminary values have been obtained for the bucklings of 15 inch and 12 3/8 inch lattices loaded with slugs of 1.66 inch diameter. These values are -4×10^{-6} cm^{-2} for the 15 inch lattice, and 76×10^{-6} cm^{-2} for the 12 3/8 inch lattice. These measurements are primarily of theoretical interest and were conducted to facilitate the testing of the theory as applied to the standard-slug size buckling values.

The center-to-surface flux ratio has been measured in the 1.17 inch and 0.926 inch slugs. Gold foils, 6 mils thick, 2 1/2 inches long and 1/8 inch wide, were used. The value obtained for the 1.17 inch slug is 1.3. This leads to a reciprocal diffusion length in uranium of 0.84. The measured value of this diffusion length for the standard-slug size is about 0.8. Analysis of the data for the 0.926 inch slug has not yet been completed.

Nuclear Physics

Two documents on neutron flux measurement techniques have been issued. One of these deals with monitoring problems, the other with the problem of determining the neutron flux spectrum inside reactors. It is pointed out in the latter report that considerable knowledge about the general character of the spectrum is required before data obtained with foils can be interpreted, in fact, foil measurements determine only the effective temperature of the Maxwellian distribution which is deduced theoretically. The usual method of determining the temperature T of the pile thermal flux depends upon measuring the change in the response of a $\frac{1}{\overline{v}}$ detector as the neutrons are filtered through successive thicknesses of a $\frac{1}{\overline{v}}$ absorber. An alternate approach, which is simpler in concept and analysis, has been devised. This method uses (1) a thin gold foil irradiated with and without cadmium shielding to normalize the total flux in the energy region of interest below the cadmium cut-off and (2) a Cd-Au alloy foil irradiated with and without cadmium shielding. The alloy foil is thick enough to completely absorb all thermal neutrons incident on its surface and only the gold activity is measured. From knowledge of the Cd and Au cross sections the ratio of gold activities in the alloy and in the normalizing foil may be related to the effective temperature of the neutron flux. A variation of a factor of two in this ratio over the temperature range of 400-700 C is sufficiently great to make possible an experimental determination of the effective temperature within fairly narrow limits. A 40 mil, Au-Cd alloy containing approximately 9% of weight of Cd has been prepared by the Metallurgy Unit and various size foils have been fabricated. Unfortunately there is an uncertainty as to the exact Cd content and the homogeneity of the foils, because of the large discrepancy in weight of Au and Cd and because of a probable selective oxidation of the Cd. A test of this point by making a preliminary irradiation of the foils will be made.

Applied Research Sub-Section

Some consideration has been given the possibility of selectively destroying the Pu-240 in product plutonium by irradiating it with filtered pile neutrons. If one assumes: a) that the neutron flux is so drastically filtered that only neutrons having energy in the range 1.0 ± 0.1 electron volts are incident on the product plutonium, b) that the one-volt resonance in the total cross section of Pu-240 can be approximated by a 0.08 electron volt wide absorption resonance having a constant amplitude of 10^5 barns, and c) that the neutron flux in this 0.08 electron volt band is 6.4×10^{10} neutrons/sq cm/sec, then the fraction of the original Pu-240 remaining after an irradiation time, T, is given by

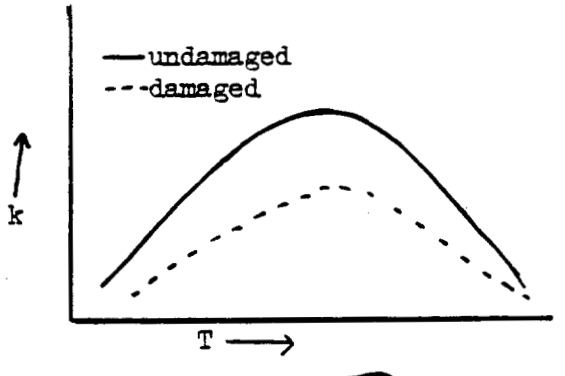
$$\frac{N^{240}}{N_o^{240}} = e^{-(10^{-19}) \times (6 \times 10^{10})\,(T)} = 10^{-2.8 \times 10^{-9}\ T}$$

The time required to reduce the Pu-240 content to 0.1 of its original value is 11.4 years. There are many uncertainties in the above considerations--the chief of these being the value of the Pu-240 cross section at energies higher than 1 electron volt. Further experimental data are needed before the feasibility of burning out Pu-240 by this means can be evaluated.

Irradiation Physics

The literature search conducted into the theory of dielectric thermal conductivity, as reported in the May, 1953 TAR, with special application to graphite has been completed.

It is felt that the mechanisms underlying this phenomena are, on the whole, quite well understood. The conduction in graphite is predominantly lattice in nature, the electronic contribution being negligible. The conductivity curve, see figure, is limited by scattering of phonons by crystallite boundaries at low temperatures and scattering of phonons by phonons at high temperatures. At the curve maximum, the two effects are of equal magnitude. Irradiation tends to reduce the size of the crystallites and thus the mean free path for this process. This has the effect of depressing the conductivity curve and shifting its maximum to higher temperatures. The mean free paths for crystallite scattering are consistent with X-ray measurements of crystallite dimensions.



Applied Research Sub-Section

Plant Physics

Calculations were finished this month on the critically safe design of the Recuplex process vessels. It was found that some of the vessels cannot be considered as always safe from a thermal chain reaction for all concentrations. This is largely due to the effect of certain reflectors that are placed around the vessels. Concentration limits have been worked out for these tanks.

The empirical formula, used to determine plutonium critical masses, has been revised by the incorporation of improved values of nuclear constants.

One of the important theoretical problems in pile physics at Hanford is that of finding the critical buckling of a cube in an infinite reflector. The problem arises in this form, of course, because of the rectangular shape of the Hanford piles. Up to the present time, only an approximate solution of somewhat doubtful validity has been available. Recently, the problem has been worked out by a variational method. This method has not yet been investigated fully, but does show promise of giving reliable solutions. A more detailed description of this work will be given when it is completed.

In connection with the investigation of the feasibility of using low-density graphite in the core of the K Pile, a calculation has been made to determine the size of the flat zone when regular graphite is used. The cold, wet, material buckling was obtained for the 7 1/2 inch lattice with a K-water annulus by a linear extrapolation of the exponential pile results with the smaller H-annulus, wet and dry. This buckling was further corrected to account for holes in a production pile. The lattice diffusion length was calculated from the measured value of the diffusion length of C-Pile graphite and the thermal utilization of graphite in the 7 1/2 inch lattice. The cold migration area was then calculated and the cold k was calculated. The hot k was found from the latter and the temperature coefficients as given in HW-25348, assuming a graphite temperature of 500 C and a nominal power level of 1300 MW. The hot k thus obtained is 1.0444. Accounting for the effect of xenon as in HW-23729, the k of the hot, contaminated lattice was found to be 1.0217. The corresponding material buckling was then calculated after the hot migration area was found. From the length of the equivalent bare pile, the longitudinal buckling was calculated, hence it was possible to obtain the radial buckling. With this datum and the radius of the equivalent bare pile, the flat zone radius was found to be equivalent to 350 flat tubes. This amount of flattening at even this low power level is indeed small and indicates that the use of enrichment would be singularly profitable in the K Pile using regular graphite and is not a unique requirement of a pile incorporating a core of low density graphite.

METALLURGY UNIT

Uranium Fabrication

A hollow uranium fuel element has been fabricated by a process similar to tube-reducing using a 6-inch rolling mill. The trial fabrication studies which have

been completed indicate that this technique has considerable promise as a method of producing hollow fuel elements. Further studies at Hanford are limited since experimentation with larger size billets requires heavier fabrication equipment than is available. Should the interest in hollow slug fabrication increase, however, the technique warrants further development work for evaluation as a full scale production method.

Mechanical Testing

The mechanical properties of a cold-swaged uranium rod have been determined in the as-swaged and annealed state. A large decrease in ductility of the annealed metal was observed. This observation has been reported by others without positive explanation, although absorbed gases have been postulated as a cause for the low ductility of the metal. Since these specimens were annealed in a vacuum, this explanation does not appear plausible and the effect may have been due to a recrystallization texture developed during the annealing operation.

Metallographic Studies

The metallographic study of uranium metal slugs which had been thermally cycled using thermal environments simulating those in an operating pile has been completed. Microscopic examination of the slugs verify the initial observations with regard to the presence of a core structure in the center of those slugs whose temperature exceeded 660 C. The transition zone surrounding this core was found to have a grain size somewhat smaller than is normally observed in beta heat-treated uranium. No indication of induced orientation effects or voids were found in any of the samples.

Two samples of the lithium-aluminum alloy prepared for Hanford and Savannah River were examined metallographically. Definite evidence of incomplete homogenization, probably due to inadequate heat-treatment, was observed in the Savannah River alloy. No inhomogeneities were observed in the sample of the Hanford slug.

Production Tests

In connection with the preparation of Metallurgy Unit Production Test specimens, the study to determine the extent to which a fusion weld can be improved by warm pressing is continuing. A standard edge weld closure was extruded one-eighth inch above the cap surface followed by a second pressing during which the extruded metal was pressed back into the plane of the cap surface. Metallographic examination of a closure so treated has shown that the procedure has considerable promise as a means of reducing the porosity of the original weld metal. The formation of the pressure weld along most of the originally unbonded can wall-cap interface is an additional advantage of this technique.

Several uranium metal specimens have been prepared for in-pile testing to determine the effect of irradiation at elevated temperature. The specimen and

can design is such that a temperature gradient ranging from 100 to 900 C is expected in the sample during the irradiation period. The samples to be irradiated were machined from slugs prepared by powder metallurgy techniques and will be carefully examined by metallographic and X-ray techniques prior to and following irradiation.

New Reactor Materials

A preliminary design and a cost estimate of a fuel element testing facility to be installed in the Materials Testing Reactor have been submitted. This facility will allow irradiation of Hanford size fuel elements at power levels up to at least 60 kw/foot with more careful observation and with greater safety than is obtainable in a Hanford reactor. The special irradiations which are contemplated for such a facility would include: testing of new fuel element designs, operation of metal slugs at higher specific powers and total exposures and at elevated core temperatures, and the testing of slugs known to possess certain defects.

A literature survey is being conducted of the high temperature properties, corrosion resistance and absorption cross section of such metals as aluminum, beryllium, iron, magnesium, molybdenum, zirconium, and their alloys. This is a part of a long range program which is being initiated to determine satisfactory structural materials for future reactors or for more extreme operating conditions in present reactors.

Service Failures

The cap assemblies from seven ruptured U-235 - aluminum alloy slugs (Rupture Nos. J-1, C-4 through C-9) were removed for more detailed examination. Five of the cap assemblies had pits or areas of apparent porosity within the weld bead. The other two had suspect holes in the can side walls near the base of the weld. However, by leak testing one cap assembly a hole was revealed in the can wall about 3/8 inch from the weld whereas no leak occurred in a more obvious hole in the weld. All of these caps have been prepared for radiographic testing to permit proper metallographic sectioning.

Metallographic examination of available tubes, of header #4 tube joint and of a rack joint from the Redox D-12 Evaporator failure, indicate that there are large lamellar inclusions throughout the metal matrix. The metal matrix of the header itself did not contain these inclusions. Corrosion tests on available tubes, header, tube rack, and vessel wall were carried out in boiling 65% nitric acid for five 48 hour periods. The corrosion rates of sensitized tube specimens from tubes 3, 4, 6, and 9 were 0.0018, 0.0014, 0.0015, and 0.0014 inches per month, respectively. The corrosion rates of sensitized specimens from the header, rack, and shell were 0.0041, 0.0040, and 0.0013 inches per month, respectively.

Spectrochemical analyses on various D-12 vessel components indicate that all the material is type 309SCb stainless steel. Chemical analyses of the steel by

wet methods are being carried out to verify the spectrochemical data.

Three valves located in the 224-U Building have recently failed. The three failures are as follows: (1) the plunger of a Hammeldahl valve which was being used in 60% UNH service, (2) a vapor vent valve which was exposed to oxides of nitrogen from the decomposition of UNH, and (3) a type 316 stainless steel gate valve in the vapor line leaving the 100% UNH concentrator. After these valves had been inspected and tested, it was concluded that the underlying cause for two of the failures was attributed to the use of the wrong material and in the third case to faulty heat treatment.

Irradiation Effects

Hardness determinations made on three wafers from slug 19, PT-105-507-A revealed that the average hardness increase, due to irradiation to approximately 200 MWD/T, was seven points on the Rockwell G scale. Annealing these wafers at 420 C for four hours to facilitate punching samples for fission product distribution analyses reduced the hardness six points to a hardness value of 77 Rockwell G. The wafers were then punched with the sample position more accurately defined than in previous punching operations.

Radiometallurgical Facilities

The chemical stripping and the slug molding equipment has been decontaminated, removed from 222-S, and prepared for installation in the high level cell in Radiometallurgy Building. Work on the metallographic cell is continuing. The Zeiss metallograph is being calibrated in the 100X to 2400X magnification range and the installation of polishing and grinding equipment was begun. A Zeiss Opton Stereo-microscope has been modified for cell use with magnifications up to approximately 12X. X-ray equipment has been reinstalled and this facility is now available for use.

Corrosion Studies

Types 304L, 309SCb, and Carpenter 20 stainless steels which had been exposed in Redox D-12 waste concentrate by Separations Technology personnel were examined. Although type 304L stainless steel showed a higher corrosion rate than 309SCb stainless steel as determined by weight loss, type 304L stainless steel is probably the better material for tank fabrication. This conclusion is reached because the face surface of the 309SCb stainless steel suffered severe intergranular attack while the 304L stainless steel did not. Carpenter 20 stainless steel suffered severe general attack by the waste concentrate solution.

Several mild steel corrosion test coupons have been lowered into the Redox waste storage tank TK-104, 241S. Since the Redox process waste is reported to be over 300 F, this field corrosion test is by far the simplest and most reliable method of estimating the true corrosion resistance of the tank liner.

Applied Research Sub-Section

The investigation of the corrosion resistance of types 304L, 347, 309SCb, and Carpenter 20 stainless steels to process solutions containing sulfides and mercaptans has been completed. The results of these tests show that none of the silver-mercaptan precipitates are harmful to the austenitic stainless steels listed above.

Corrosion testing of types 304L and 309SCb stainless steels in solutions containing 100 to 10,000 parts per million chromium (VI) and 10 to 60% nitric acid has been completed. The data show that satisfactory service of either metal can only be realized when the nitric acid concentration is 10% or below and the chromium (VI) concentration is less than 100 parts per million. The corrosion rates for both metals increase rapidly with increasing concentrations of chromium (VI) and nitric acid.

A number of Teflon products impregnated with graphite or fiber glass are being tested in both boiling 60% nitric acid and boiling 100% UNH. Tentative results indicate that both the graphite filled and fiber glass filled Teflons exhibit good resistance to the test solutions.

Helical springs fabricated from type 304L stainless steel wire are being considered for use in Purex pulse generating equipment. Since no attack was observed upon exposing these springs to Purex 2AW solution at 50 C for 14 days, these helical springs are considered suitable from a corrosion standpoint for Purex application.

234-5 Metallurgy

Two specimens of Croloy 5, a steel formerly used for reduction bomb casings in RG operations, have been tested using the stress rupture machine. The specimens were stressed to 2925 psi and then heated at a rate such that the temperature of the specimen reached 750 C at the end of 15 minutes. Once the specimens reached 750 C, they were allowed to cool for 1.25 hours. This temperature cycle was repeated until the specimens ruptured. The stress applied to the specimens is related to "off-standard" pressures which have been observed in the reduction bomb during Task III operations. The first specimen failed after 23 cycles and the second ruptured after 31 cycles. The per cent elongation at rupture for these specimens was 31 and 39% in 4-inches, respectively. Croloy 5 is a better material for fabricating bomb casings than is the SAR-1010 steel which was evaluated previously.

Two inverse rate heating curves and one cooling curve have been made on pure plutonium metal. The following phase transformation temperatures were detected: α to β at 134 C, β to γ at 204 C, γ to δ at 305 C, δ to ε at 462 C, and the melting point at 614 C. Additional thermal analysis runs on pure plutonium metal are being carried out using different heating rates to verify the above transformation temperatures. The transformation temperatures obtained are in substantial agreement with the Los Alamos data with the exception of the melting point which appears to be about 22 degrees lower than the Los Alamos value.

Applied Research Sub-Section

A specimen of pure plutonium (α phase) in the "as-cast" condition is being examined metallographically. The plutonium sample was mounted in Laminac 4116 casting plastic, ground on emery paper and mechanically polished using carbon tetrachloride as a lubricant. The specimen was electropolished and etched in an aqueous solution containing three weight per cent tetraphosphoric acid and three weight per cent glycerine. Photomicrographs have been taken at 250X and 500X. Since the rate of oxidation of the polished and etched surface is high, the metallographic examination has to be completed within 15 minutes.

The lathe hood in the Plutonium Metallurgy Laboratory has been activated and operates satisfactorily. This facility was used to prepare a plutonium charge for thermal analysis investigations. The X-ray hood in the same laboratory, which was damaged during leak testing, has been repaired and returned to the laboratory.

234-5 Chemistry Research

Attempts have been made to melt and recover plutonium metal from plutonium skulls and associated oxides by dropping the skull in molten calcium or magnesium which was protected from oxidation by a purified argon atmosphere. Apparently the argon gas flow was too low to adequately protect the reactive melt as only metal oxides were recovered.

Past experiments have shown that plutonium dioxide is readily chlorinated with carbon tetrachloride at substantially lower temperatures than those required to convert cerium oxide to the trichloride. Because cerium trichloride is obtained at about 475 C with phosgene, it is expected that this gas will produce the corresponding reaction with plutonium at 300 to 400 C, a temperature range in which the corrosion rate for several structural alloys is negligible. An experiment to test this hypothesis was performed using about 20 g of plutonium dioxide at 300 C. After four hours the chlorine plutonium ratio of the product was 2.14. Further chlorination at 350 C had to be discontinued, when grease on ground-glass joints began to decompose. This experiment is now being repeated.

Four runs to evaluate sulfur monochloride as a chlorinating agent demonstrated that it was unsuitable at temperatures of 200 to 800 C because of low conversion yields and deposition of sulfur throughout the colder portions of the apparatus.

Plutonium-aluminum alloys may be prepared by reducing plutonium oxide with an excess of aluminum in a sealed bomb. Although it was considered likely that a plutonium-aluminum alloy would also be formed when plutonium oxide was reduced with a stoicrometric amount of aluminum, two bomb reductions were performed to verify this hypothesis. In both reductions cerium dioxide was used as a plutonium dioxide "stand-in". In the first experiment a bomb was charged with cerium dioxide, calcium oxide, and aluminum. Aluminum reduces ceric oxide and the resulting aluminum oxide dissolves in calcium oxide; the proportions of aluminum and calcium oxide are adjusted to yield the eutectic composition of the oxides which melts at 1400 C. Excessive pressure in the bomb forced premature conclusion of this experiment. For the second experiment the charge

Applied Research Sub-Section

was ceric oxide, alumina, and calcium plus an iodine booster. The resulting button contained 5% of the cerium charged, alloyed with four moles of aluminum per mole of cerium.

Several experiments on conditions for precipitation, dehydration, and reduction of calcium plutonium (IV) fluoride have shown considerable promise. With initial concentrations of plutonium and calcium of 38 and 6.4 g/l, respectively, supernatants after precipitation form 1M nitric acid and 2M hydrofluoric acid ranged in plutonium concentration from 0.04 to 0.35 g/l, depending on the time elapsed between decanting and sampling. Drying at 400 C in a stream of Freon-12 or oxygen-free argon gave a compound with the formula $CaF_2 \cdot PuF_4$. Four batches, prepared under conditions which currently appear to be most favorable, have been reduced to metal with yields ranging from 85.2 to 95.3% and averaging 89.8%.

Nickel Plating Investigation

Protection of cleaned pieces of cerium from oxidation in aqueous electroless baths has been unsuccessful. Although gallium wets cerium and the nickel is deposited readily, the resulting coating does not adhere to the piece. That oxidation occurs despite the gallium coat was demonstrated by X-ray analysis of the substratum. It is thought that more rapid coating might alleviate the problem of oxide formation on the piece to be coated. Efforts to improve the deposition rate for acid-type baths for nickel plating have resulted in modular deposits.

Molten ethyl pyridinium bromide prepared with considerable care to exclude water was found to corrode cerium and to deposit tarry reaction products on the metal. Since the nickel coat would not adhere to such a surface, work on this problem has been discontinued.

CHEMISTRY UNIT

In-Line Analysis

The three separate in-line analytical installations in the Metal Recovery Process A line proved to be sound, although in each case some difficulty was encountered in connection with construction material.

As noted last month, the monitor for gamma in RCU developed a high background which was subsequently identified as ruthenium that had plated out on the steel surfaces of the counter chamber. Similar adsorption was found to occur on Tygon and Polythene surfaces; Teflon, Fluorothene, and glass did not present this difficulty. As a consequence, a glass cell was fabricated and installed, and the unit has subsequently given troublefree operation for two weeks. It was of interest that the continuous gamma scan showed occasional pips, indicating high gamma levels in the flow line for brief periods of time. Since these occurred only during withdrawal of the final volumes from the RCU holding tank, it was postulated that they resulted from solid matter that had been floating on the

surface of the liquid. As a consequence, an operational change has been made to provide for recycle of the final volumes from the holding tanks. A second gamma monitor is being purchased by Manufacturing for installation on the B line.

Fifteen days of successful operation of the in-line photometer for monitoring uranium in RAF provided data showing an agreement of ± 0.6% with control laboratory analyses. Difficulty was encountered with corrosion of the electrical leads and contacts and steps were initiated to provide a more rugged unit.

The in-line polarograph for monitoring uranium in Metal Recovery waste operated successfully for an aggregate time of 15 days and demonstrated its value in allowing immediate control of operation. The difficulty encountered was that of failure of valve seats after 1000 to 2000 cycles. Steps are being taken to obtain a more rugged valve.

A document issued during the month gave a complete description of a gamma counting technique that is suitable for monitoring plutonium in Recuplex waste thus providing a safeguard against build-up of critical quantities of plutonium in the waste tanks. A proposal that an in-line photometer might accomplish this monitoring equally well and at a considerable saving in installation cost will receive some investigation.

Design work was completed in the Design Section on the installation necessary for providing direct mass spectrometric analysis of P-10 product. A decision was reached late in the month to make a parallel installation for direct analysis of the combined P-10 by-product and off-gas.

Investigation has continued along several lines in an effort to develop a direct system for monitoring the plutonium content of flowing streams. A unit developed and reported several months ago employed a system for taking discrete samples, drying them, and counting the alpha emission. A more direct system involves use of a scintillation crystal separated from the flowing stream only by a thin protective film; preliminary results with one such unit shows a detection limit corresponding to 1 mg/l of plutonium.

Instrumental Analysis

Work has continued sporadically for many months in an attempt to solve the troublesome problem of determining acid in the presence of hydrolyzable salts, such as those of uranium and aluminum. It was found that the addition of thiocyanate and oxalate followed by coulometric titration in a 70% alcohol medium yielded exceptionally good results;

Sample	Recovery	Precision
10 ul	102%	± 2%
50 ul	100.6%	± 2%

It is postulated that the unexpected effect of thiocyanate may be due to its destruction of polymerized uranium.

Investigations are continuing with X-ray diffraction and infrared absorption techniques in an effort to characterize the atomic structure of uranium-oxygen compounds. It was noted in a study of UO_3, U_3O_8, UO_2, and UO that the U-O bonding energy decreases with decreasing oxygen content of the compound. Comparisons of uranium and tungsten trioxides showed the hydrates to be similar in structure but indicated that UO_3 may have a chain type linkage, whereas WO_3 appears to be octahedral in nature.

Isotopic analysis of enriched uranium (C and J slug material) has been attempted by the isotopic shift method employing emission spectroscopy and the hollow cathode excitation source. Preliminary results with both metal and oxide samples are quite promising and hold forth considerable hope that accountability analyses are possible by this means.

Chemical Methods

Work has continued in several directions to effect minor improvements in the recently developed method for determining dibutylphosphate and to investigate its application to plutonium-containing streams. A by-product of the problem is a study of the rate of hydrolysis of mono, di, and tributylphosphate under various conditions. It was shown that the half-time hydrolysis for MBP at 50 C and in the presence of uranium and acid (RCU composition) is several weeks.

The electrochromatographic unit installed last month has been tested further and continues to show very satisfactory operation. It effected a complete separation of uranium from UX_1 and readily indicated the anionic nature of the uranyl oxalate complex.

The analytical standards program was continued during the month with 87 separate determinations being reported from the control laboratories. The work was concentrated on 200 Area samples with satisfactory results being shown, especially for the determination of uranium.

Radiochemistry

Radiochemical work during the month involved continuation of a number of problems which have been previously discussed. Ten mg of americium were obtained and shown to be quite suitable as a source for the determination of high level concentrations of plutonium by gamma ray absorption techniques; a plutonium oxide source providing the weaker x-radiation from plutonium was prepared and will be tested for its application to various process determinations. Equipment has been assembled, and cold tests have been carried out prior to recovery of enriched plutonium obtained during reirradiation of normal plutonium in the Arco pile. Work is essentially complete for the Physics Research Unit involving the recovery of lithium iodide and tritium from a sample that served as a neutron flux monitor in tests carried out in the Arco pile. Approximately 30 new samples

have been received for analysis in the renewal of the program for determining the composition of irradiated slugs as a function of their geometry.

Fission Product Chemistry

Considerable effort has been expended during the past year in studying methods for preparing and identifying pure forms of the various ruthenium ions. This work was carried out mostly in perchlorate solutions where there is little tendency for ruthenium to form complexes. The information so gained will be employed in elucidating the complex chemistry of ruthenium in nitrate and nitrite systems.

One series of tests during the past month involved the oxidation behavior of divalent ruthenium in the form of $Ru(NO_2)_6^{-4}$ in hot nitric acid solutions. Under these conditions permanganate effected a slow -- approximately one hour -- oxidation to RuO_4. However, pretreatment with peroxide, followed by permanganate addition, effected the oxidation in a matter of several minutes. Periodate caused complete oxidation in a matter of approximately 10 minutes.

Tetravalent ruthenium ion in the presence of sulfamic acid or of a mixture of sulfamic and sodium nitrate remained unreacted for a period of 16 days at room temperature. Similar treatment with sodium nitrite effected a slow change in the Ru^{+4} content.

Under investigation is the postulate that the ruthenium species RuO_4 may be the key to the poor ruthenium decontamination in the solvent extraction separations processes. In a two phase system of free chlorine in nitric acid solution and carbon tetrachloride oxidation of ruthenium to RuO_4 and extraction into the organic phase was observed, whereas in the aqueous phase alone RuO_4 was not formed. Further, research experience indicating that RuO_4 is the only ruthenium form readily absorbed on reducing surfaces coupled with recent observations of ruthenium build-up on surfaces immersed in Metal Recovery RCU solution suggest the RuO_4 may be a factor under process conditions where it has not previously been suspected.

Waste Treatment

Work reported last month described the volume reduction factor at room temperature of nickel ferrocyanide suspensions which precipitate radiocesium. During the present month a series of tests defined the behavior at elevated temperatures. Volume reductions of 5, 10, and 16-fold were obtained at room temperature, 43°, and 80°, respectively. When precipitated hot, or before the addition of cesium, the initial decontamination is lower although the equilibrium value is unaffected.

Tests with macro amounts of cesium showed that the scavenging properties of nickel ferrocyanide are due to the formation of an insoluble precipitate $Cs_2NiFe(CN)_6$. The presence of excess potassium or ammonium ions had little or no effect on the composition of the precipitate.

Applied Research Sub-Section

Separations Research

Further tests were carried out to define the backmixing effect in pulse column operation that was referred to previously. At larger pulse amplitudes, backmixing is enhanced; at increasing aqueous flow rates, backmixing is reduced. The effect under various conditions was defined in numerical terms as the column height at which a tracer was reduced to half its original concentration. This proved to be in the range one inch to eight inches in columns with stage heights of about one foot. There is a possibility that this effect may reduce the stage height of process columns by a factor of 25% or greater.

An interesting observation resulting from pulse column studies is that under certain conditions -- especially at large frequency-amplitude products -- the total net flow is reduced by employment of larger plate openings.

In the field of extraction studies previous work has shown that surfactants promote dispersion but inhibit extraction rate. A series of static diffusion studies was initiated in an attempt to find a surfactant that does not have the deleterious property of inhibiting extractions. Aerosol MA appeared to have this property, but subsequent studies with the vibrational stirrer showed that it reduced uranium transfer rates.

A derivative of furan was synthesized in the laboratory and tested as a uranium extracting agent; it proved to be better than hexone but not as efficient as TBP. In parallel work a supply of an alkene phosphone diamide was prepared. This will be tested with respect to uranium and fission product extraction and will be employed as the starting compound for the preparation of a polymer that will subsequently be tested for its ion-adsorbing properties.

Two separate 10 g samples of irradiated uranium were ignited in an argon-oxygen atmosphere as part of a long range study of alternate methods for the decomposition of irradiated slugs. The ignition went rapidly and completely to form an oxide that was readily dissolved in nitric acid; 85% of the ruthenium volatilized during the burning. The resulting uranium solution was subjected to both Purex and Redox extraction scrub treatments. Decontamination of zirconium-niobium and ruthenium was normal, except that low Redox ruthenium DF values were obtained.

Redox Research

Two cold batch countercurrent runs, one employing Pu(IV) and the other Pu(VI), were carried out according to the newly developed reflux flowsheet previously referred to. The data so obtained allowed development of a modification which controls build-up of nitric acid during the reflux action. Two countercurrent batch extraction runs according to the modified flowsheet established equilibrium data, showed the absence of uncontrolled nitric acid reflux, and showed that excessive 2AW plutonium loss would occur if plutonium in the feed were in the tetravalent form. Hot Semi-Works runs successfully demonstrated the reflux flowsheet and yielded products within specifications.

Applied Research Sub-Section

A series of short range tests aimed at improved Redox decontamination all yielded negative results. The addition of phosphate, fluoride, or oxalate in 2DA scrub and the addition of acid phosphates in 2E column organic phase all failed to effect improved zirconium-niobium decontamination. Although ion exchange treatment with Dowex A2 has been reported successful in decontaminating hydrochloric acid solutions of uranium, no similar beneficial effect was found from nitric acid solutions. Calcium, magnesium, and zinc nitrates were individually tested as alternate salting agents for Redox; at concentrations of salting strenths equivalent to 1.35 M ANN, poorer decontaminations were observed.

Purex Research

Data from other sites indicate that the removal of UX_1 in the Purex Process may be marginal because of refluxing action in the HA column. One run was carried out to test this possibility. Over a 15-hour period it was found that UX_1 concentration increased steadily and that no steady state concentration resulted.

Previous work showed that permanganate-peroxide and thioglycollic acid pretreatments were effective in reducing ruthenium extraction in the Redox 1A treatment. Similar pretreatments of Purex 2DF solution failed to yield beneficial effects in subsequent batch extractions.

Metal Recovery Research

Batch tests were previously carried out in an attempt to improve Metal Recovery decontaminations by employing ANN scrub solutions. Subsequent Mini extraction studies with 1 M ANN, in place of 2 M HNO_3, as scrub reduced the waste loss by 2-3 times but resulted in poorer decontamination by 2-3-fold. Independent extractions studies showed that the substitution of ANN increased the rate of transfer by 60%.

Laboratory Waste Disposal and Decontamination

Approximately 1,000,000 gallons of retention basin waste from the Works Laboratory Area were processed to ground. Twenty-six waste cartons from 3706 Building, requiring special handling, were disposed of via the burial ground. Eight trips were made to the 222-S facility, 200 West Area, for the disposal of 38 gallons of liquid waste in various sized bottles and shielding containers.

A modification was made in 340 Building. This provided for the pumping of waste, collected in "crib" waste tanks, directly to adjacent retention basins. This change was made so that crib waste, of analysis less than retention limits, might be disposed of directly without the necessity of having to truck it to 200 West Area. Approximately 8000 gallons of the 13,000 gallons collected during the month were diverted to the retention system in this manner.

Applied Research Sub-Section

EQUIPMENT DESIGN

In collaboration with Pile Technology and Metallurgy personnel, equipment was scoped for experimental irradiation of Hanford slugs in the Arco Materials Testing Reactor.

Designs for the remote lathe and remote mill for use in the Radiometallurgy Building multicurie cells were completed sufficiently to permit shop fabrication to start. The remote "high speed sampler" for slug jackets was followed in the shops; fabrication is nearly complete.

Design of an enclosed powder metallurgy installation was completed.

Several start-up problems of the Radiometallurgy Building have been followed. For example, the in-cell airfilters and housings of Radiometallurgy Building multicurie cells were found to be inoperable, in that they could not pass more than about 20% of required airflow and could not be handled remotely. They are in process of redesign, and various cell airflow tests are being made.

A remote chemical setup was developed and installed in 222-S Building multicurie cell for a batch heavy element chemical separation. As a remote operation the process is very complicated, since a great number of separate steps are involved, including sample entry, dissolving, centrifugation, numerous reagent additions, several resin column extractions, pipetting, multiple sample removal, remote gamma level indicating, controlled temperature heating and cooling, etc. The anticipated radiation values of 100-200 curies of gamma and 1/10 curie of alpha required special preparations for shielding, confinement, viewing, manipulating, and later decontamination and disassembly. The multicurie cell, used previously for a high-gamma metallurgy operation, was decontaminated very successfully and safely by removal of the strippable coating. The new chemical setup was undergoing cold runs at month's end.

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 August, 1953 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
Clifford, W. E. & Burns, R. E.	The Use of Nickel Ferrocyanide to Scavenge Cesium from Process Solutions

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

FW Albaugh:ltc

1205908

MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

M.F. Parr, Foxboro Company, Foxboro, Mass., visited HAPO July 27 - 31 to study design details of 105-K Power Calculator.

R. B. Clendineng, The Bristol Company, Waterbury, Conn., visited HAPO July 27 - 31 to repair faulty recorders.

J. O. Jackson, Pittsburgh-Des Moines Company, Pittsburgh, Pa., (retained by AEC as consultant on effect of bomb blast on stability of elevated tanks) visited Richland August 11, for consultation.

C. S. Slenning and F. B. Akerson of the Brown Instrument Company, Philadelphia, Pa., visited HAPO August 13 to investigate instrument maintenance problems.

W. J. Love and R. A. Huggins visited the Bingham Pump Company, Portland, Oregon, August 6, to witness pump tests. W. J. Love returned again August 29 for same purpose.

B. R. Elder visited the Aluminum Company of America, Lafayette, Inc., and Kensington, Pa., August 10 - 14 to discuss aluminum fabrication.

G. L. Locke visited the Bingham Pump Company, Portland, Oregon, August 14 to witness pump tests.

W. M. Harty visited the Dow Chemical Company, Boulder, Colo., August 13 and 14 for inspection of Rocky Flats equipment.

H. S. Davis visited the Corps of Engineers, Troutdale, Oregon, August 31 to discuss test program on high density concrete.

W. M. Harty visited the California Research and Development Corporation, Livermore, Cal., on a recruiting assignment August 31 - September 1.

ORGANIZATION AND PERSONNEL

Personnel Statistics:	July 31			August 31		
	Exempt	Non-Exempt	Total	Exempt	Non-Exempt	Total
Design Management	2	1	3	2	1	3
Process Engineering Sub-Section	59	12	71	57	12	69
Design Planning Unit	16	13	29	16	13	29
Design Engineering Sub-Section	84	12	96	86	12	98
Total Section Personnel	161	38	199	161	39	199
Technical Graduates (Rotational)	-	9	9	-	9	9
TOTAL	161	47	208	161	48	208

	July 31			August 31		
	Exempt	Non-Exempt	Total	Exempt	Non-Exempt	Total
Temporary loan from ANP			3			3

Accessions - 1

Separations - 1

GENERAL

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

	Man Months Expended	% of Total
1952 Expansion Program	99.0 *	66.4
Research and Development	30.6	20.5
Other Projects and Design Orders	19.6 *	13.1
	149.2 *	100.0

* Equivalent man months reflects amount of overtime on Expansion Program and other Design Projects.

DESIGN DEVELOPMENT

Statistics:

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

	Man Months Expended	% of Total
RDS - D-10 Reactor Design Development	5.9	19.3
RDS - D-11 Water Plant Design Development	12.5	40.8
RDS - D-12 Separations Design Development	2.2	7.2
RDS - D-13 Mechanical Design Development	5.8	19.0
RDS - D-14 Utilities & Services Design Devel.	2.2	7.2
RDS - D-15 Engineering Standards and Materials Development	2.0	6.5
	30.6	100.0

RDS D-10 and D-11 - Reactor Plant Design Modification

The study to develop a scope basis for modifications to existing reactors which will permit operation at substantially higher power levels is being continued. The development work to date has demonstrated that the proposed program is economically sound; there is a practical engineering method of achieving the desired physical plant modifications; and increasing power levels of existing reactors represents the best plan for increasing plutonium production.

1205910

It was recommended that the B, D, DR, F, H, and C reactor plants be modified for operation at increased power levels. To permit operation at these increased power levels, it is recommended that the reactor and the water plants be modified as required for a design flow rate in 100-H of about 68,000 gpm and in each of the other (not including C) of approximately 66,500 gpm. The flow at 100-C will be 98,000 gpm.

A plan for process water pump modifications (190 Building) was recommended. Each group of three electrically driven process water pumps would be replaced by two larger electrically driven pumps. All existing steam-driven primary pumps would be retained to furnish shutdown flow in case of electric power outage.

RDS D-11 - Water Plant Design Development

Tests of protective coatings for use on effluent lines and retention basins are being continued. Inspection of samples in the 107-H East Retention Basin revealed that after approximately 120 days exposure only seven of the original 23 indicate that they will effectively withstand test conditions for a longer period of time. Inspection of samples in the heated flow lab water indicated that only 6 coatings of the original 20 were effective after 130 days immersion. To date "Napko Durachlor" and "Napko Duraphene" have best withstood the test.

RDS D-12 - Separations Plant Design Development

Design scope is currently being prepared for revisions to the equipment of the TBP Plant. These revisions provide increased recovery of uranium, improved decontamination of uranium and increased plant capacity. Preliminary studies indicate that, until better removal rates are achieved, the TBP Plant production will be limited by the rate at which uranium can be removed from underground tanks. The swirl-type-pulse column, recently developed by the Technical Section, may limit required changes within the TBP Plant to the provision of two new columns and minor changes to associated pumps and piping. The value of the additional uranium which could be recovered with new columns through the reduction of waste loss exceeds $1,000,000.

RDS D-13 - Mechanical Design Development

All components of the prototype fuel element canning machine have been received. Cold runs are scheduled for early in September and full scale testing will start about October 1, 1953.

Preliminary design was completed on a sampling mechanism for an automatic alpha counter. Further work is being done on cost estimates to gauge more fully the extent to which the instrument can be applied in Redox and other plants.

Preliminary development work was completed on a meter to measure centrifuge eccentricity and a prototype instrument is being constructed.

RDS D-14 - Utilities and Services Design Development

The study of various methods to provide emergency reactor cooling water was continued and appraisal of suggested methods is in progress.

Total electrical requirements of supply for Hanford when 100-K Areas are in operation will equal the capacity of the existing 230 kv installation. A one-step 230 kv expansion is required for any major addition of power as would be required by prospective new loads of water plant revisions. The one-step is proposed to be accomplished by securing the existing Bonneville Power Administration Midway-Franklin 230 kv line. Work is progressing on various methods of tying-in this new line to the present system.

RDS D-15 - Engineering Standards and Materials Development

Cost plus estimated commitments to date for development of engineering standards is $24,200.

The following standards and revision to standards were approved by the Standards Representatives during August:

D-3-5	Details of Gate and Fence Ground
D-3-5a	Substation Fence - Grounding
C-4-2a	Steel Ladders
C-4-2b	Steel Ladders - Details
C-4-4	Chain Gate
E-1-4	Steel Reinforcing Bar Data
D-1-10	Common 120 volt receptacles - Plant Buildings and Offices

The progress on standards and material development work for August is as follows:

a. The specification for oxalic acid etch screening test for stainless steels was completed and issued for comments.

b. Investigation of the use of nitrogen as a substitute for argon as a purging gas in the welding of stainless steel is complete. The use of nitrogen is entirely satisfactory and will save approximately $40,000 annually with construction at the present level.

DESIGN PROJECTS

Statistics:

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

		Man Months Expended	% of Total
CA-512-R	100-K Reactor	56.3	47.4
CA-512-W	100-K Water Plant	3.7	3.1
CA-513	Purex Separations Facility	19.9	16.8
CA-514	300 Area Expansion	13.9	11.8
CG-551	Expansion of Bldg. 234-5 Facilities	5.2	4.4
Major Projects - Other than Expansion Program		15.0	12.6
Minor Projects and Design Orders		4.6	3.9
	Total	118.6 *	100.0

* Equivalent man months expended reflects amount of overtime on Design Projects.

1205912

CA-512-R - 100-K Reactor Facilities

Design progress on Project CA-512-R, 100-K Reactor Facilities, was advanced 0.9% during August to 96% complete. Progress for August is based on approximately 1920 drawings whereas previous monthly reports reflect progress based on approximately 1850 drawings. A total of 1839 drawings has been approved to date, including 102 drawings approved during August.

Expenditures to date are approximately $1,717,900 against an authorized amount of $2,781,500. A revised Design Section estimate of $2,350,000 for CA-512-R was released which is a reduction of $431,500 from the currently authorized funds.

Nine hundred and fifty-seven requisitions have been issued by the Design Section for procurement of engineered items for the 105-KW and 105-KE facilities. The total value of this equipment is approximately $16,100,000.

Construction work on the 105-K process unit model is continuing with the required portions of the building being 90% complete. Fabrication of the removable graphite blocks, thermal shield, and the inlet and outlet faces is complete.

The design of the gas facility is approximately 99% complete and 112 drawings have been issued for approval out of 113 required drawings. All specifications have been issued for approval. Of the six acceptance test procedures, three have been issued for comment, and two for approval.

The design of the furniture and hardware requirements for the 105-K Building was completed. A total of ten structural steel fabrication drawings were checked during the month. In addition, 327 drawings were reviewed for BPF approval, of which 49 drawings were returned unapproved.

Design of all instrument details included in the original scope of the project is essentially complete. The temperature monitor specification and requisition have been revised and forwarded. The final assembly of the sample room piping of the water activity monitor system has been momentarily delayed pending testing of the 105-C system. This will not delay construction and should permit an improved design.

Design of the Water Studies Laboratory is approximately 5% complete. Drawings have been started and four drawings were issued for formal comment.

CA-512-W - Water Plant Facilities

The decision was made to order equipment and start installation at once for pH correction of filtered water by use of caustic soda. Tests to date indicate that caustic soda is satisfactory from the standpoint of corrosion.

The report on the Stability Study for the 100-K Emergency Generators was issued for comment and is being prepared in its final form.

Review of electrical drawings and specifications submitted by the Architect-Engineer continued through the month.

CA-513 - Purex Facility

Detail design of the Purex Waste Facility was advanced 25% during the month to 75% complete, based on 146 drawings required for construction exclusive of standards or study drawings. Further study of specific gravity of the waste to use in the design of the tanks has indicated that the value of 2.0 could be reached. It was determined that, since the maximum specific gravity is not reached at the same time that the maximum shrinkage occurs during the setting up of the concrete, plastic flow in the concrete will relieve shrinkage stresses and thereby allow higher working stresses. On this basis, a tank is being designed with two foot thick walls which will withstand forces produced by waste having a specific gravity of 2.0

Over-all design of the Purex Outside Facilities was advanced 6% during the month to 94% complete. Eight drawings were issued for comments and approval, and four were approved for construction. A design engineering review was made of a lump sum contract bid proposal for the 284-E Power House Addition.

Design work on CA-513-B, UO_3 Plant Expansion remained at approximately 98% due to lack of vendor instrument information. Schematic instrument drawings were received the last week of the month and should allow instrument design to proceed.

Design of the Hot Semiworks Conversion, CA-513-D, was advanced 8% during the month to 17% complete. A drawing schedule was issued listing 96 drawings required for the work. Design work was started on piping for A, B and C cells and six drawings of new or modified existing vessels made by the Technical Section have been reviewed and approved.

Severe contamination of the Redox canyon and crane has concentrated attention on the Purex Plant hazard control and clean-up facilities. Revisions being studied which would improve these facilities in the Purex Plant include those which would minimize thermal air currents from opened cells, and increasing air supply and exhaust to and from the canyon and cells.

Work on the two models of the 202-A Purex Building is progressing satisfactorily with carpentry work on the over-all display model being 90% complete. Present status indicates that the model will be completed on schedule.

CA-514 - 300 Area Expansion

Detailed design work on the 300 Area Expansion Program, exclusive of the addition to the 313 Building structure and services which are being done by an architect-engineer, was advanced 9% during the month to 61% complete. Design activities were concentrated on the 313 Building process equipment and remodeling of the existing structure. Data were compiled showing required production rates at successive 313 Building process stations for 150 and 175% of the scope capacity, together with station capacity as designed. It was decided to double each station capacity in the component preparation area and to incorporate radiographic fuel element inspection equipment in the production lines. Drawings and specifications for the distribution conveyors between the canning and finishing area, the finishing area conveyor, and the air bath machine have been completed and transferred to the Project Section.

The final contract drawings and specifications for the 313 Building structure and the acid, caustic and methanol facilities were submitted by the architect-engineer for review and coordination with the other phases of design. These have been returned for final corrections. Drawings and specifications have been issued for approval for purchase of the partitions and crane system in the existing 313 Building.

CG-431-B - 100-C Area Production Facilities

The revision of drawings to the as-built status is continuing and 587 drawings have been revised and returned to file. In addition, the drafting room has completed revising an additional 400 drawings which have not been checked and signed.

CA-431-C - Metal Examination Facility Equipment

Design work on the underwater metal examination equipment at 105-C was advanced 9% during the month to 16% complete. Work is starting on an underwater weasel chamber. All equipment must now be designed to accommodate crooked and warped slugs.

CG-496 - Recuplex Installation - 234-5 Building

Detailed design of the Recuplex installation is approximately 97% complete, an advance of 2% during the month. The remaining work includes design of chemical storage facilities for nitric acid, aluminum nitrate nonahydrate and caustic soda. These facilities will eliminate drum handling required previously by piping chemicals from storage tanks outside the 234-5 Building into the tanks in the chemical make-up room.

CA-535 Redox Capacity Increase, Phase II

Final design for Redox Capacity Increase, Phase II was advanced 5% during the month to 45% complete. Sixteen drawings for the parallel operation phase of Redox Expansion were completed and forwarded to the Project Section for final approval. Three instrument drawings were reviewed and returned to the Vitro Corporation.

CA-539 - Redox 241 - SX Tank Farm

Detail design of the Redox Tank Farm was advanced 1% during the month to 91% complete. Five drawings were approved and one requisition was written for 4450 lineal feet of $3\frac{1}{2}$" O.D. stainless steel tubing.

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

Design work on the Activation of Task I, Building 234-5 is approximately 17% complete, an advance of 3% during the month. Design progress was hampered because of scope changes involving added shielding requirements. Five scope drawings were completed and issued to the Project Section for approval.

CG-550 - Reactivation of P-10 Facilities

Detailed design on Reactivation of P-10 Facilities was advanced 2% during the month to 67% complete. Progress was limited because of a major change in design scope involving increased shielding requirements. Progress includes the scope change which required the equivalent of 22 drawings.

CG-551 - Expansion of Building 234-5 Facilities

Design work on Expansion of Building 234-5 was advanced 7.6% during the month to 30.3% complete. Forty-three drawings of a required 237 have been approved to date. Purchase requisitions and specifications issued for procurement of critical material and equipment now total $18,300.

CG-558 - Reactor Plant Modification for Increased Production

Funds for the initiation of design of the Reactor Plant Modification for Increased Production as a project were authorized by the AEC and limited project design will start in September.

D.O. 100329 - New 2101 Fabrication and Storage Facility

Design of the control console for the electrically operated switchgear has been completed and issued and an acceptance test procedure for the substation transformer was issued.

D.O. 100473 - Hot Ball Detection, Ball 3-X System

A method of separating "hot" balls is being developed. Timing requirements for operation of a deflecting gate are imposed by a variation in the speed with which the balls travel when being recovered from the reactor. Various mechanical systems of diversion are being considered. Radiation detection circuiting for initiating gate operation has been developed and checked in test.

D.O. 100529 - Ball Third Safety System - Ball Recovery System

Detail design was continued on the revisions to the existing Ball 3-X System. A total of 36 electrical drawings have been completed and issued.

D.O. 100539 - New Facility for Lattice Testing

Design was continued and two additional schemes have been prepared for a proposed prototype facility.

D.O. 100577 - Gamma Monitor Chambers - 107 Basins

Design on the gamma monitor chambers was advanced to 20% complete and all purchase orders have been placed.

D.O. 100646 - TBP Plant Revisions to Maintain Capacity (221-U)

Design on an emergency basis was started on revisions to the TBP Plant for two-cycle series operation and is approximately 5% complete. Preliminary design is being done to investigate the need and establish the economic justification for additional TBP Plant changes to obtain greater capacity, improved yields and improved decontamination.

D.O. 100652 - Redox Ventilation Recirculation Unit

Design was started on a portable ventilation unit for drawing air from across open cells in the Redox plant and discharging through filters back into the canyon.

Design Section Work Completed During August

D.O. 100402 Repair of 105-D Effluent Line
D.O. 100422 Improved Lighting for 761 and 762 Buildings
D.O. 100470 Positive Pressure Type Process Samplers 244-WR
D.O. 100626 100-D & F Retention Basin Diversionary Outlets

INVENTIONS

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

R K Beaton
Manager - Design
ENGINEERING DEPARTMENT

DESIGN SECTION WORK STATUS

PROCESS ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS *

Description	Backlog Start of Month	Orders Received During Month	Time Spent During Month	% of Total Effort	Backlog End of Month	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Balance
CA-512-R	336.7		21.9	45.0	314.8	18.0	14.0	12.0	12.0	12.0	12.0	232.8
CA-512-W	31.3		0.7	1.4	30.6	1.0	1.0	1.0	1.0	1.0	1.0	24.6
CA-513	23.1		2.8	5.7	20.3	3.0	3.0	3.0	3.0	3.0	3.0	2.3
CA-514	24.4		1.4	2.9	23.0	1.0	1.0	0.5	0.5	0.5	0.5	19.0
CG-551	36.1		2.8	5.8	33.3	2.5	2.5	2.5	2.5	2.5	2.5	18.3
Pile Modifications						4.5	7.5	8.0	8.0	8.0	8.0	
RDS	401.1		18.3	37.6	382.8	23.0	24.0	26.0	26.0	26.0	26.0	231.8
Design Orders	26.4	5.0	0.8	1.6	30.6	1.0	1.0	2.0	2.0	2.0	2.0	20.6
TOTALS	879.1	5.0	48.7	100.0	835.4	54.0	54.0	55.0	55.0	55.0	55.0	549.4

DESIGN ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS *

CA-512-R	100.4	30.0	24.8	33.7	105.6	18.0	15.0	14.0	10.0	9.0	8.0	31.6
CA-512-W	31.5		2.8	3.8	28.7	2.5	2.5	1.5	1.5	1.5	1.5	17.7
CA-513	69.7		13.9	18.8	55.8	14.0	11.0	9.0	6.0	4.0	3.0	8
CA-514	31.2	20.0	10.7	14.5	40.5	9.0	9.0	5.0	5.0	4.0	4.0	4.5
CG-551	21.6		1.6	2.2	20.0	2.0	3.0	4.0	3.0	2.0	2.0	4.0
RDS	217.4		5.0	6.8	212.4	11.0	16.0	20.0	20.0	23.5	23.5	98.4
Major Projects - Other	115.0	21.0	11.2	15.2	124.8	18.0	17.0	17.0	17.0	16.0	16.0	23.8
Minor Projects & Design Orders	63.6	5.0	3.7	5.0	64.9	4.5	5.5	7.5	8.0	8.0	8.0	23.4
Available for Anticipated Future Work								3.0	8.5	11.0	13.0	
TOTALS	650.4	76.0	73.7	100.0	652.7	79.0	79.0	79.0	75.0	69.0	66.0	212.2

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects	Anticipated Future Work	Totals
Architectural & Civil	98.0	34.0	132.0
Mechanical	213.4	46.0	259.4
Electrical	162.6	43.0	205.6
Instrument	138.4	29.0	167.4
Standards	40.3	12.0	52.3
TOTALS	652.7	164.0	816.7

* Exclusive of Technical Graduates and people on loan fr other sections.

[redacted]

HW-29229

MONTHLY NARRATIVE REPORT - AUGUST 1953

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Following is a summary of personnel data for the Project Section covering August, 1953.

	August 1, 1953	August 31, 1953	Net Change
Employees on Payroll	566	576	+10
Technical Graduates - Rotational	15	12	-3

The end-of-month status involved these changes:

	Project Section Personnel	Tech. Grad. - Rotational
Payroll Additions	8	
Payroll Removals	12	
Transfers into Section	17*	4
Transfers from Section	3	
Transfers within Section	6	

*Seven of this number were Technical Graduates who were transferred to Project Section. Four Technical Graduates were rotated to the Section, leaving an overall net reduction of three Technical Graduates.

B. SCOPE OF ACTIVITIES

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox, 3%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.8%; CG-438, Ball Third Safety System, overall, 96.5%; CG-496, Recuplex, 20%; CA-506, Repairs to 100 Areas Retention Basins, 100%; CA-512, 100-K Area Facilities - Water Plants, KW, 27.2%, KE, 21.2%, Reactor Buildings, 105-KW, 24.24%, 105-KE, 12.98%, CA-513, Purex Facility, Part "A", 8.8%, Part "B", 47%, Part "C", 99.9%; CA-514, 300 Area Expansion, overall, 11%.

C. MATERIAL PROCUREMENT

The work load for Inspection at vendors' plants increased substantially during August. The larger orders for 100-K Reactor and for the Purex Facilities are going into production. Vendors of shielding blocks for the 100-K Reactor are gradually reaching full production; however, the vendor for base blocks has not as yet produced acceptable blocks. The magnetite ore for concrete shielding has been delivered, but acceptable limonite ore has not yet been received.

It now appears that serious difficulities with gun barrel tubing and horizontal safety rods are increasing. The 40-inch prototype liquid-liquid centrifuge for Purex is being completed for testing about the middle of September 1953. The vendor is running trial production on pots for P-10.

Several strikes in vendors' plants threaten construction schedules at Hanford. Among these are strikes at Chapman Valve Company, affecting 100-K construction, the G.E. X-Ray Plant which is providing the Maxitron for Project CA-192, Biology Laboratory, and the vendor for Recuplex vessels.

D. CRAFT LABOR

The attempts by sheetmetal workers and plumbers to obtain special radiation hazard pay has made little progress. The A.E.C. has notified both the Plumbers' Union and J. A. Jones that such premium pay will not be approved, and the overall demands by sheetmetal workers were referred to union membership without specific mention of special hazard pay. The Asbestos Workers' Union continued to withhold men from Hanford. There was little change in the jurisdictional dispute between millwrights and machinists in 2101-M Building; however, graphite production has continued during the month. A jurisdictional dispute between pipefitters and sheetmetal workers has delayed work intermittently at 105-KW. Settlement was effected on at least nine jurisdictional disputes involving work managed by Minor Projects Sub-Section. Negotiations between the Teamsters' Union and the contractors reached the stage of exchanging proposals, with certain questions being reserved for discussion. A wage increase of 14¢ per hour was offered the Roofers' Union, and their acceptance has been indicated. Neither the consolidation of Boilmakers' and Blacksmiths' Union nor the withdrawal of Carpenters' Union from the AFL has had any noticable effect locally.

E. SAFETY AND SECURITY

Eight regular meetings for discussion of safety and security and health topics were attended by about 410 personnel. Two special hazards meetings were conducted for personnel assigned to CG-538, Redox Waste Line, and CG-539, 241-SX Tank Farm. The training movie entitled Fundamentals of Radioactivity was shown. There were five "Tool Box" meetings and one foremen's meeting conducted for J. A. Jones service personnel.

F. HIGHLIGHTS OF UNIT ACTIVITIES

Inspection, Drafting, and Estimating Sub-Section

Inspection workload continued to increase as larger orders for 100-K and Purex Facility went into production. Inspection was completed on 36 orders. There were 153 requisitions for Program "X" processed, and 164 Program "X" orders for engineered items placed during the month. At the end of August there were 241 open requisitions for items which will require inspection. Some draftsmen engaged in the drafting assistance contract are being released about September 18, 1953. Drafting production was 215 new drawings, 17 charts and graphs, and 501 revisions. Drafting was

essentially completed for 100-K Reactors, Recuplex, and the Purex Tank Farm. The Reproduction group output was 923,597 square feet during the 20 regular working days of August. Estimating group completed 32 estimates, of which 10 were project proposals. Field Surveys group completed field work for A.E.C. on the proposed site for the new elementary school. This group also completed the semi-annual coal pile inventory for the 100 Areas, and a survey of monuments for 200-W Area.

Minor Project Sub-Section worked on 53 project items and five informal requests, representing an estimated total of $23,345,500. Completed work consisted of four projects and two engineering requests, the completed projects being Aquatic Biology Laboratory, Pile and Pile Water Plant Improvements, Repairs to the 100 Areas Retention Basins, and Painting 105-B, D, and F High Tanks. Some further work on Retention Basin Repairs must be done, but it is being listed as an exception. Painting of the high tanks was accomplished by Minor Construction for about $25,000, an underrun of about $17,000. Three project proposals were approved by the A&B Committee. Five authorizations were granted by the A.E.C. Three engineering request assignments were accepted during the month. Important projects now in progress include Recuplex, 300 Area Expansion Program, Fuel Element Pilot Plant, Re-activation of P-10 Facilities, and Hot Semiworks Conversion.

Reactor Projects Sub-Section

Main elements of the Hanford Laboratory are approaching completion. Only three major projects, Radiochemistry Building, Pile Technology Building, and Mechanical Development Building, remain unfinished. Outside facilities and utilities are 99% complete. Construction of 100-K Waterworks is progressing in all major parts. The cumulative total of concrete placed was KW, 59,556 yds; KE, 45,408 yds, general facilities, 7,199. Structural work for 190 and 165 Buildings indicates that an accelerated construction schedule will be required. The 105-KW structural work was nearly completed; so work was confined to the storage and transfer area and the 115 Building. The sub-contractor's work was completed on the 300-foot ventilation stack, and he has begun construction of the 105-KE stack. Installation of mechanical equipment continued in both 105-KW and 105-KE. The first tier of grates for 105-KW was installed and accepted. Production of graphite on the Sundstrand machines is approaching their capacity, considering hardness of stock. The milling operations began August 10, on a two-shift basis. Preparation of limonite sand and aggregate has been slow, but the sub-contractor has made recent improvements in production. Fabrication of downcomers at White Bluffs has been delayed. A change of jigs is being considered as a solution to the problem.

Separations Projects Sub-Section

Overall design of the Purex facility was 73% complete, and overall construction was 9.98% complete. The foundation mat for Building 202-A was completed August 7, and the second lift of the south canyon wall was started on August 25, 1953. Construction of Part II, Redox Production Plant, began August 3, and progressed to 3% complete. A solution to the problem of sample gallery ventilation was 20% accomplished. The 18" steam distribution line from the 284-E Boiler House to the Purex plant and the 24" raw water distribution lines were completed and accepted. Construction on Part "B", UO_3 Expansion, was suspended on August 10, for lack of equipment and material, but modification of kettles has continued in the Minor Construction shop. The Purex Prototype was essentially complete, with all work scheduled for completion during September. Construction on Redox Capacity Increase - Phase II was 8% complete, and other work orders are being issued. The steel contractor for 241-SX Tank Farm began welding of tank bottoms on August 22. Placing of concrete was scheduled to begin September 1. Bird Machine Company has completed redesign of the 40-inch centrifuge, and is preparing for tests by September 15, 1953.

Project Control Unit continued its routine functions. Unit personnel designed and made initial use of a Summary Cost Report and Estimate which was more readable and less costly to prepare. The History group published one history.

G. 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

J. S. McMahon, Manager - Projects

August 31, 1953

[redacted]

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

ERA-753 - Asbestos Shakes 100-B, D, and F Buildings

Design was 35% complete. An informal request was prepared for the application of asbestos shakes to some 100-B, D, and F Area Buildings. The estimated cost was $16,700.

ERA-1207 - 100 Area Expansion Program

A design request for $1,000 has been received for the purpose of preparing schedules for proposed methods of increasing water coolant flow to the existing Reactor. These schedules and their effect on pile shut down are to be used in estimating the scope of the project.

ER-2744 - New Dry Waste Crib 222-S Building

The Separations Section has requested preparation of a project proposal for a new crib to replace the existing one. Actual preparation is awaiting the results of a study on disposal of contaminated wastes which is now being conducted.

2. Final Reporting

CA-364 - Aquatic Biology Laboratory

Work was accepted on August 14, 1953. The as-built drawings are being prepared.

CG-482 - Pile and Pile Water Plant Improvements

Work was completed August 14, 1953, and accepted on August 21, 1953. Revision No. 3 of the project proposal has been transmitted to the A&B Committee.

CG-506 - Repairs to the 107-B, D, F, and DR Retention Basins

A request for extension of time to January 1, 1954, was denied by the A.E.C.; so a physical completion notice is being prepared. All outstanding work is to be completed by plant forces. An estimate of this work, as well as accruals for engineering and other commitments, is being prepared.

CG-536 - (ER-A-686) Painting High Tanks - 105-B and 105-F

Painting was completed August 4, 1953, by Minor Construction forces at a cost of about $25,000. This represented an underrun of about $17,000. The project is being closed out.

ERA-752 - Specifications for Equipment Removal - 186-D

Preparation of contract has been completed and the bid assembly, in final form, has been reviewed by all interested parties.

ER-2723 - Steel Handling System - 272-W

With design at 20%, the 200 Area Plant Engineering group has formally requested cancellation. An adequate concrete pad was made available so that the proposed work would have been unnecessary.

3. Current Projects

CA-192 - Remodeling Building 108-F for Biology Laboratory

Design had been completed previously; construction for the total project progressed 2% to the total of 94%. Construction on Parts 3 and 4 progressed 11% to a total 33%. The lump sum portion of the work is ahead of schedule. The installation of duct work and piping is progressing, and mechanical tie-ins are essentially complete. Delivery of the Hauserman partition is scheduled for September 1, 1953. The strike at the G.E. X-Ray plant continues to delay the delivery of X-Ray equipment. Although the funds are committed, no delivery has been established.

CA-431-A - New Reactor - 100-C Plant (Waterworks)

Completion status remained at design 100%, construction 99.9%. Work orders are being completed for remaining items of work in Buildings 183-C, 190-C, and 184-C.

CA-431-B - New Reactor - 100-C Plant (Reactor)

Completion status remained at design 90%, construction 99.8%. Completion of work orders has been generally satisfactory; however, additional funds are required for completion of the Metal Examination Facility and the hot water re-circulation system.

CA-431-C - Metal Examination Facility - 105-C

Design progressed 21% to a total of 56%. An additional authorization of $104,773 to the General Engineering Laboratory is being routed for approval.

This amount is expected to cover all of their work including slug dollies, slug measuring equipment, and slug weighing. Shop fabrication of the first binocular periscope viewer and other items is expected to begin in September, 1953. Engineering reviews are being conducted of other underwater equipment.

CG-438 - Ball Third Safety System

Design completion status remained at 100%; construction progressed .5% to a total of 96.5%. The A.E.C. approved the interim extension of time to January 1, 1954. Revision No. 3 to the project proposal, requesting additional funds and an extension of time to April 1, 1954, was transmitted to the A.E.C. on August 22, 1953. A work order for $14,200 and the necessary revised drawings were issued to the Reactor Section to allow the bidding of work on solenoid and circuitry exceptions.

CG-496 - Recuplex Installation, 234-5 Building

Design progressed 3%, to a total of 98%; construction progressed 1% to a total of 20%. The concrete shielding wall and the compressed air installation were completed. A strike at the vessel vendor's plant threatens to delay the delivery of vessels. A revised project proposal is being prepared for transmittal to the A&B Committee late in September, 1953.

CA-512 - 100-K Area Facilities

100-KW and 100-KE Water Plants

Over all design of Water Plants progressed 5% to a total of 95%. Construction progress was as follows: KW progressed 1.2% to a total of 27.2%; KE progressed 3.2% to a total of 21.2%. Construction progress consisted of excavation, of placing of rip-rap for the 181-KW forebay, earth work for the launching jetty for the outfall lines, and concrete work for outfall structures and tank foundations. Also, work continued on the Filter Plants and structural work for Buildings 190 and 165. Total concrete placed reached the following totals: KW Water Area 59,556; KE Water Area 45,408; General Facilities 7,199. Installation of flash mixers in 183-KW was continued, and installation of monorake assembly has been started.

105-KW and 105-KE Buildings

Over all design progressed 3% to a total of 97%. Construction progressed as follows: KW gained 7.24% to a total of 24.24%; KE gained 2.2% to a total of 12.98%. Cumulative total of concrete placed for 105-KW was 20,423 cubic yards, and for KE 18,783 cubic yards. The cumulative total of structural and miscellaneous steel was 2,287 tons for 105-KW and 1,577 tons for 105-KW. The ventilation stack was completed at 300 feet above base, and the sub-contractor has begun erection of the stack for 105-KE. Concrete placement for 105-KE is approaching completion, and installation of mechanical equipment has begun.

A major problem, leveling of base plates for the 105-KW Reactor, was partially solved when the Pearlite roofing was completed. The roof affords better control of temperature in the process area, and the temporary control was further helped by use of the supply fans. The base plates and membranes of 105-KW were grouted.

The first tier of crates for 105-KW was installed and accepted. The side crates were welded in place, and the corner crates are approaching completion. Vendors of side shielding blocks have approached production, but vendors for top and base blocks are still experiencing considerable difficulty. The magnetite ore has been delivered to plant site, but acceptable limonite ore has not been secured.

Installation of various instruments and electrical facilities has continued; however, progress has been impeded by labor difficulities and delayed material. The fabrication of cross headers was increased during August by installation of an additional welding jig ; however, production of outlet cross headers is about two months behind schedule. Fabrication of down-comers at White Bluffs has been quite slow when compared to the amount of money expended. The problem may be partially solved by changing the fabrication jigs.

2101 Building - 200 E Area (A.E.C. Administered)

Because of the continued delay in completion of 2101 Building, it was generally agreed that A.E.C. should retain custody. On August 17, the A.E.C. provided a representative to administer completion and maintenance work in the building, thus leaving G.E. personnel free to concentrate on production of graphite.

Graphite production on the Sundstrand machines has slowly appoached their capacity. On September 3, more than 2700 blocks passed the pre-shop machining. This was an exceptional production. The unusual hardness of material delivered by National Carbon necessitates frequent changes of milling cutters. The pre-shop drilling machines were started and are operating satisfactorily; however, at least four fabrication shop lines are idle because of insufficient personnel. The contractor has consulted the G.E. personnel on ways and means of improving production. A two-shift operation appears to be the immediate solution, with the probability that considerable overtime will be approved.

In order to utilize the graphite on hand, the Design Section has relaxed certain specifications which allow the use of cracked stock in the tube blocks. This expedient should reduce the percentage of material which must be totally rejected because of cracks.

CA-531-A - Purex Facility

Overall design for Purex progressed 10% to a total of 73%; overall construction progressed 3.1% to a total of 8.8%. The foundation mat for Building 202-A was completed August 7, with a total of 14,190 cubic yards of concrete in place. The first lift on the north canyon wall was placed

August 20, and the second lift on the south canyon wall was started August 21. To date 16,442 cubic yards of concrete have been placed in the permanent construction of 2C2-A Building.

The 18" steam distribution line from Boiler House 284-E to the Purex Plant and the 24" raw water distribution lines were completed and accepted. Re-design of the 40" prototype liquid-liquid centrifuge has been completed; Bird Machine Company is preparing for testing by September 15, 1953. The A.E.C. has initiated procurement of Purex centrifuge from the Bird Machine Company on a negotiated-contract basis. This action was based upon the excellent progress of the prospective vendor and the strong recommendation of G.E. engineers.

513-B - Uranium Oxide Conversion Facility

Construction progressed 9% to a total of 47%. Work was temporarily suspended on August 10, to await delivery of furnaces from the Selas Corporation; however, modification of kettles was continued in the Minor Construction shops. A meeting was scheduled for September 1, to determine when full scale construction can be resumed.

513-C - Purex Prototype 321 Building

Construction remained at about 99%. The water demineralizer is being installed.

CA-513-D - (ER A-747) Hot Semiworks Conversion

Design was 23% complete. Design progressed considerably on work on cell piping, architectural items, and instrumentation. Bids are being reviewed and orders placed for special material and equipment.

CA-514 - 300 Area Expansion Program - Production Facilities

Design progressed 2% to a total of 57%; overall construction progressed 4% to a total of 11%. Construction of the addition to 313 Building is still behind schedule because of late delivery of structural steel. Actual completion was 37%, compared with 73% scheduled completion. The Operations Change House was likewise behind schedule.

A. Process Facilities

Detail design progressed 6% to a total of 55%; construction progressed 1% to a total of 16%. Bid closing dates for special equipment have been extended. The lump sum contractor has almost completed the concrete footings and building perimeter walls. Pit footings and walls are being placed. Structural steel erection was begun August 20, 1953, and the contractor has submitted a revised construction schedule with completion date of October 14, 1953.

B. Acid, Caustic and Methanol Facilities

Detail design progressed 5% to a total of 95%. All drawings and specifications, with the exception of methanol still, have received final comments and are being revised. Work for the methanol still is to be accomplished on a design-and-fabricate bid basis.

E. Decontamination Station

Detail design progressed 32% to a total of 72%. Drawings and specifications are being revised by the architect-engineer.

G. Railroad

Both scoping and design had been completed previously; construction progressed 27% to a total of 97%. The lump sum contractor has completed all railroad work except the road closing.

H. Process Sewer

Both scoping and design had been completed previously; construction progressed 2% to a total 92%. Minor Construction forces are placing the tie-in line between the new diversion box and the south pond.

K. Manufacturing Office Building, Gate House and Parking Lot

Detail design progressed 1% to a total of 31%. Drawings and specifications for the addition to the 3701-L Gate House are being revised. The contractor has been awarded a modification to construct the necessary roads and walks within the 300 Area.

L. Change House Renovations 3707-A and B

With scoping completed, no further work was done.

M. Oil and Paint Storage

With scoping completed, no further work was done.

N. Steam and Water Facilities

Detail design progressed 7% to a total of 12%. The preliminary drawing for the new 300 area loop has been issued for comments.

P. Hutment Removal

With scoping completed, no further work was done.

[redacted]

Q. Fire Alarm System

Scoping had been completed previously; detail design progressed to 27% complete.

R. 3506 Telephone and Security Alarm

The Telephone Unit has been given a work order to procure the necessary exchange equipment for 300 Area. Although the approved scope allowed 26 lines, the Manufacturing Department has since requested 33 new lines for the 313 Building.

CG-550 - (ERA-746) - Reactivation of P-10 Facilities

The design completion was revised downward to 70%, because of additional scope. Construction progressed 10% to a total of 43%. It was learned during the month that the radiation level of the DR-10 material is about 20 times higher than that of the H-10 material. Increased shielding is to be required; so a revised estimate was obtained for Revision No. 2 of the project proposal. The total estimated cost is now $533,000. The Revision is being submitted to the A&B Committee for review at the September meeting.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 5% to total of 25%; construction progressed 2% to a total of 3%. The principal progress was on improvements to the sample gallery ventilation. A revised project proposal is being prepared to include scope changes. Procurement began on August 14, when the purchase order for pipe connections was placed.

CA-187-D-III (ER 2739) - Redox Cooling Water Disposal Basin

Design progressed 35% to a total of 50%. Drawings and specifications for bid purposes are being prepared. A work release was issued to Minor Construction for performing the percolation test and blading the area for the lump sum contractor.

CA-406 - Phase II, Mechanical Development Building

Design had been completed previously; construction progressed 2% to a total of 92%. With the approval of A.E.C., Minor Construction Service Forces began placement of shop equipment on August 24, 1953. The following day an official inspection was made, and a list of exceptions was compiled for contractor performance.

CA-434 - New Bio-Assay Laboratory

Design progressed 8% to a total 98%; construction progressed 7% to a total of 8%. Final design and specification for Phase II (electrical and mechanical) have been reviewed and returned to the architect-engineer for corrections of omissions and errors. Construction is slightly ahead of schedule, with about one-third of the concrete work complete. Masonry was begun.

CA-441 - Solvent Building

Design completion status remained at 25%. The project authorization was issued August 13, 1953, on the basis of design by an architect-engineer; however, performance of detail design for G.E. is now being considered.

CG-447 - Portable Meteorological Mast

Completion status remained at design 100%, construction 99%. The A.E.C. has written a directive deleting the component meter and data analyzer from the scope. Purchase of the component meter will be handled as a separate item by the Radiological Sciences Department. Funds for completing exceptions have been allocated, and a new completion date of November 15, 1953, has been established.

CA-455 - Replace Two Elevated Water Tanks in 200-E Area

Design had been completed previously; construction completion was estimated at 25%. The previous statement of 45% was revised because work had been over-estimated by the contractor. This tank is now being erected, and demolition work on the other is nearing completion.

CG-477 - Building 284-W - Fifth Boiler Addition

Design had been completed previously; construction progressed .5% to a total of 99.5%. The revised project proposal which requested permission for General Electric to perform "start-up" work was not approved by A.E.C; instead, A.E.C. requested that the project be closed out as of August 1, 1953, and that the remainder work be accomplished on a work order basis. Formal papers stating this decision have been received.

CA-489 - Neutron Monitoring Calibration Facilities

Design had been completed previously; construction was begun and progressed to .5% complete. The low bid was $58,284. The High Voltage Engineering Corporation has proposed that the additional engineering equipment be furnished in conjunction with the accelerator. The cost of this additional equipment was estimated at $13,000.

CG-511 - Completion of Minor Construction Fabricating Shops

Design completion status remained at 95% complete; construction progressed 12% to a total of 75%. Additional work is being done on s coping and preparation of a revised proposal. Installation of shakes was completed, as was installation of the exhaust system in the Tranportation Shop. All critical materials have been received.

CA-516 - Gable Butte Railroad

Design completion status remained at 50%. The proposal has been approved by the Hanford Operations Office and is now awaiting A.E.C. approval in Washington.

CA-517 - Fire Protection Buildings, 272-E and W

Design completion status remained at 30%. An informal request, for an estimated cost of $18,500, is being routed for formal approvals.

CG-519 - Replacement of 100-D Reactor Effluent Line

Design progressed 1% to completion; construction progressed 13% to a total of 80%. All 60" pipe has been laid, and all rocker arm assemblies have been set. The two 60" gate valves have been bolted in place. Work is continuing on installation of electrical service, alter a tion of the valve house over the distribution chamber, and setting up the transition sections.

CG-520 - P-13 Pressure Assembly Removal (ER A-1182)

Design progressed 10% to completion; construction progressed 87% to a total of 97%. The Minor Construction portion of this work has been completed, and a stop charge notice was issued August 21, 1953. The mock-up and removal facilities were erected in the 190-H Building and turned over to Maintenance Sub-Section for their training program. Maintenance Sub-Section will disassemble and store the facilities following completion of their training.

CA-525 - Permanent Auxiliary Combined Civil Defense and Plant Disaster Control Center

Design had been completed previously; construction progressed 32% to a total of 55%. Action on the revised project proposal has been deferred by A.E.C. until construction nears completion. The control center is scheduled for completion during September or early October 1953.

CA-527 - (ER - 2718) Fire Protection - 200 East and West Spare Parts Warehouse

Design had been completed previously; plant forces have completed their portion of construction; and the lump sum contractor was 98% complete. The remaining

work consists of back-filling and miscellaneous clean-up.

CA-529 - Personnel Meter Gatehouse Facility Improvements

Completion status remained at design 100%, construction 0%. The A.E.C. has issued a letter of acceptance of the additional justification. Bid invitations are being issued.

CA-532 - (ER-2737) Fiscal Year 1954 Water Tank Replacements

Completion status remained at design 20%, construction 0%. The project proposal was approved by the A&B Committee on August 10, and forwarded to the A.E.C. Although the proposal was informally approved August 20, 1953, the directive has not been received.

CA-533 - (ER E-479) Hanford Works Official Telephone Exchange

Completion status remained at scope 82%, design 12%. Three bids for furnishing and installation of the telephone exchange equipment were received and opened. The low bidder requires a total of 16 months for fabrication and installation, or about three months longer than the scheduled completion time. An engineering evaluation of the bids is being prepared for the Commission. The location of the exchange has not been agreed upon.

CA-535 - Redox Capacity Increase, Phase II

The overall design was about 58% complete. Architect-engineer design progressed 2% to a total of 50%; General Electric design progressed 26% to a total of 72%. Construction began and progressed to .8% complete. Procurement was about 28% complete. Construction progress consisted of shop fabrication of jumpers for the G-5 centrifuge feed tank installation.

CG-538 - (ER 2734) Install Underground Waste Line Between "S" Area and "U" Area 200-W

Design progressed 11% to completion; construction progressed 23% to total of 77%. The concrete trench has been completed, and all pipe lines have been placed and tested. The 241-SX tank farm was completed except for installation of the exposed piping, and the 241-U tank farm was about 20% complete. Some back-filling has been done.

CA-539 Additional Waste Storage for Redox

Design completion remained at 93% complete, and the General Electric portion of construction progressed 7% to 47% complete. Overall construction progressed 3.3% to a total of 8%. Excavation was about 8% complete, and reinforcing steel has been placed in bases of tanks No. 101, and 102.

[redacted]

The steel contractor started welding tank bottoms August 22. Concrete placement was scheduled to begin September 1, 1953. Electrical work was completed except for installation of one transformer which has not been delivered.

CG-543 - (ER 2733) Replace Sanitary Tile Field 200 West Administration Area

Design completion status remained at 40%. The project proposal is being reviewed by the A&B Committee. The work scope contemplates the replacement of tile fields for the 200-W administration and for the 200-U Area, with work to be performed by lump sum contractor.

CG-544 - (ER A-661) Central Distribution Headquarters

Design completion status remained at 27% complete. A study of justification for use of Building 2713-E as a transportation garage was continued during August.

CG-545 - (ER A-724) Soil Science Laboratory Facilities

Design progressed 20% to a total of 85%; construction was about 30% complete. Construction is being continued on portions of facilities that do not require detail design. All critical materials have been ordered.

CA-546 - (ER 3099) Fuel Element Pilot Plant

Scoping had been completed previously; detail design progressed 21% to a total of 31%. Drawings and specifications for the first phase were received from the architect-engineer and routed for comments. The Bureau of Budgets has not released funds for this facility.

CG-549 - (ER 2731) Activate Task I, RMA Line - Building 234-5

Design progressed 1% to a total of 28%; construction remained at 6% complete. Progress was delayed by high priority work.

CG-551 - Expansion of Building 234-5 Facilities

Design progressed 18% to a total of 28%. The fabrication of hoods is scheduled to begin in late 1953.

CG-556 - (ER A-1201) X-Level Controlling and Recording Equipment

With scoping complete, the A.E.C. issued Directive HW-310 which authorizes General Electric $54,000.

CG-559 - (ER A-1200) Heat Transfer Laboratory

With scoping complete, the project proposal is now awaiting approval of the A.E.C.

IR-116 (A E.C.-P 138) Combined Civil Defense and Plant Disaster Control Center

Design had been completed previously; construction began with remodeling of the existing trailer and progressed to 1% complete. All special and engineered materials have been requisitioned.

IR-159 - (ER-2742) Improved Ventilation Facilities, 201-C

Design progressed 60% to completion; construction began and progressed to 30% complete. Minor Construction forces have begun work on fabrication of ducts, recondition of motor and fan, and prepared the fan pad.

* * * * * * * * * *

The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month:

ER A-725 - Particle Problem Animal Exposure Equipment

Design completion status remained at 10%. A firm justification has been developed by Radiological Sciences Department, and a project proposal is being prepared.

ER A-727 - 313 Building Roof Repair or Replacement

Design completion status remained at 50%. Further work awaits completion of 313 Building addition.

ER A-735 - Graphite Hot Shop and Storage Building

With design at 15%, completion of the project proposal is awaiting A.E.C. approval.

ER A-736 - Transportation Garage and Facilities - 2713-E

Design completion status remained at 10%. Information has been sent to Transportation Section for review and confirmation.

ER A-741 - Renovation of 3722-A, 3702, and 3703 Buildings

Design completion status remained at 50%. Further work awaits decision on use of 3722-A Building.

ER A-742 - Remodeling First Aid Buildings 100-B, D, and F

Design progressed 1% to a total of 3%. Work on justification was continued.

ER A-748 - Laboratory Supply Space, 3706 Building

Design completion status remained at 25%. Further work on the project proposal awaits decisions by the Metal Preparation Section.

ER A-750 - Metal Stock Storage, Building 3717

Design completion status remained at 30%. The informal request has been forwarded to the A&B Committee.

ER A-751 - Facilities for Special Pile Measurement

Design completion status remained at 2%. Work on preparation of a project proposal was stopped until construction funds became available.

ER A-1204 - Panellit Gauge Testing Facilities

Neither design nor construction has begun. The purge pumps at 105-D were tested August 20. The pumps maintained a satisfactory constant pressure, but the tests revealed that the flow of water between the Panellit board and front face must be reduced. This phase is being studied further.

ER A-1205 - Physical Constants Test Reactor (New Facility for Lattice Testing)

Neither design nor construction has begun. Building arrangements have been prepared.

ER A-3098 - Cobalt 60 Source for Radiation Studies

Design completion status remained at 50%. The Engineering Department is reviewing this proposal.

ER A-3100 - Modifications to 314 Building and Installation of Electroplating Pilot Plant

Design progressed 5% to a total of 10%. At the request of Technical Section, this project is being rescoped to eliminate the electroplating and anodizing facility. Facilities in the 314 Building are to be expanded, and service facilities are to be supplied.

ER-2741 - Conversion of 200-W Laundry to Offices

Design began and progressed to 2% complete. Further work was delayed until September 1953.

ER-2743 - First Cycle Waste Supernatant Cribbing Facilities

Design progressed 30% to a total of 40%. The project proposal, at an estimated cost of $42,000, was submitted to the A&B Committee.

ER E-485 - Additional Generator Capacity for Heat Studies - 189-D Building

Design progressed 5% to a total of 15%. A preliminary drawing, cost estimate, and rough draft of the project proposal were prepared and furnished to the Technical Section. It is now planned to accomplish the work by work order at an estimated cost of $98,000.

CC-5461 through 5464 - Thermal Insulation at Building 2101-E, 200-E Area

No progress was made because installation mechanics have remained off the job.

CC-5601 - Preparatory Work for Installation of 101 Canning Machine - R & D Prototype

All work has been finished except installation of checker plate.

Other work orders are progressing satisfactorily.

C. RELATED FUNCTIONS

Minor Construction Contracts

Although the J. A. Jones Construction Company has located six acceptable electrical sub-contractors, it is now planned to extend the sub-contract with Pacific Electric Company for another month or until another electrical sub-contract is awarded.

Inspection, Drafting and Estimating

With the larger orders for 100-K Reactor going into full production, the work load of Inspection continued to increase rapidly. Some additional orders placed for Kaiser Engineers required immediate inspection, and there was also increased activity among suppliers of stainless steel for Purex. The Inspection and Materials Unit made numerous reassignments of work and also increased its personnel by five.

The vendors of Thermal shielding for the 100-K areas are experiencing varied results. The W-blocks are generally acceptable, as are the MK-B blocks; however, side and base blocks have been of poor quality and quantity. The vendor of top blocks has improved his operation to the degree that he should be producing satisfactorily during September. The magnetite ore has been delivered to Hanford, but an alternate source of limonite ore has not been arranged.

The two downcomer approaches have been accepted and received on the plant. The biological shielding crates are now 90% complete. Production on the aluminum process tubes has not begun. The vendor of tubing for gun barrels has encountered unexpected problems of quality; so final inspection only will be made at prime-vendors' facility. There was no inspection activity on safety rods.

The vendor of P-10 pots is making trial runs for production. Steel for Purex is being received in increasing quantities; however, a great deal of tubing is failing the corrosion test. There has been little disbursement of steel from the warehouse.

The following is a resume' of inspection activities during the month:

ITEM	NUMBER
Open requisitions requiring inspection	241
Orders assigned to inspectors	97
New orders received	61
Orders completed	36
Sub-vendors orders assigned to inspectors	23
Total requisitions for Program "X" transmitted	153
Total orders for Program "X" placed - Engineered Equipment	164

At the end of August there has been grand totals of 1,629 program "X" requisitions transmitted, and 1,386 program "X" orders placed for engineered equipment

Drafting production for the month was 215 new drawings, 17 charts and graphs, and 501 revisions. The drafting room average was 7.4 man-days per drawing. It is now believed that some of the men engaged under the drafting assistance contract can be released about the middle of September 1953. There was little progress made on CA-512-R because of incomplete information for electrical drawings. Drafting for Recuplex and for the Purex Tank Farm was essentially complete, and work was begun on the Conversion of Hot Semiworks. Four men have been assisting the Graphics Unit on models of 105-K Process Unit and Purex equipment.

The Reproduction group produced 923,597 square feet during the twenty regular working days of August. The larger orders processed during July were 24,154 prints for CA-512-R, 8,604 prints for CA-513, and 7,590 prints for CA-512-W. The Audit and Inventory team has almost completed the physical inventory of the tracing vault.

The Estimating group completed 32 estimates during the month. The completed estimates comprised the following: project proposals - 10, comparative - 3, fair cost - 4, high spot - 5, scope - 5, miscellaneous - 4.

The Field Surveys group completed field work for A.E.C. on the proposed site for a new elementary school, a survey of 200-W monuments, and the semi-annual coal pile inventory for 100 Areas. This group continued work on horizontal and vertical controls for contractors to the A.E.C.

Project Control Unit continued its routine functions on administration, budgets, reports, and unitization. Unit personnel designed and made initial use of improved Summary Cost Report and Estimate. The History group published one history, 234-5 Building, Phase II and III.

D. CRAFT LABOR

Voluntary termination of construction contractor personnel remained about level during August. The percentage termination from Kaiser Engineers and associates was 6.4%, and from Blaw-Knox and associates 10%. J. A. Jones and associated sub-contractors lost 1.7% by voluntary terminations.

Graphite work was resumed in the 2101 Building on July 29, following understandings reached at a meeting in Oakland. At meetings scheduled in Richland for August 3, 4, and 5, some progress was made toward a workable formula for division of work between millwrights and machinists. A brief work stoppage of millwrights on August 14, was forbidden by the Union's international office, and the millwrights were ordered back to work. Both unions have committed themselves to uninterruped production pending the outcome of a meeting between the international presidents of machinists and millwrights.

Asbestos Workers' Union continued to withhold men because of no contract.

A jurisdictional dispute between pipefitters and sheetmetal workers concerning installation of Panellit tube sheetmetal ways has delayed work in 105-KW. This inter-craft friction has continued.

The Teamsters' Union and the contractors have exchanged proposals concerning (1) the rounding off of present rates to the nearest 5¢, plus 15¢ effective July 1, 1953, and (2) a health and welfare plan involving an employer contribution of 7½¢ per hour, effective July 1, 1954. Discussions were continued on doubletime for overtime work, an increase in foreman differential, and official working rules for Hanford.

The demand by sheetmetal workers for special hazard pay was referred to the Federal Mediation and Conciliation Service. At a meeting in Richland on August 10 - 13, the basic proposals were accepted, but with no reference to "onerous or hazard" pay. A Memorandum of Understanding was drafted and referred to the union membership.

A May 16, 1953, demand by plumbers and fitters for special hazard pay (time and one-half) was acted upon by the Joint State Board of Negotiators and/or Arbitrators in Seattle on August 7, 1953. The Board concurred in the resolution for the hazard pay "where any employee is required to wear protective clothing required by A.E.C. Government regulations or employer." The A.E.C. has notified both the local union and Minor Construction that such a premium will not be paid. The demand has been referred to A.E.C., Washington.

A wage increase of 14¢ per hour in conformance with the Yakima settlement was offered the roofers. No answer has been received.

Effective July 1, 1953, the boilermakers and blacksmiths consolidated their unions. There has been no local effect.

On August 12, 1953, the International Brotherhood of Carpenters announced their withdrawal from the AFL, supposedly as a result of a "no-raid" agreement between AFL and CIO. The local union has decided to continue its present policies, evidently because of indications that the breach is temporary.

G-1532. 1-D

GENERAL ELECTRIC COMPANY

[redacted]

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

HW-29229

September 8, 1953

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

AUGUST, 1953

[redacted]

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

VISITORS AND BUSINESS TRIPS

Visitor	Date	Address	Purpose
C. E. Bussert T. G. Lake	8-6,7-53	Fernald	To discuss result of Beta Heat Treatment
F. A. White	8-17,21-53	Knolls Atomic Power Laboratory	To discuss joint KAPL-HAPO experimental work

Name	Date	Place Visited	Purpose
W. T. Kattner	8-1,8-53	Mallinckrodt Chemical Works	Discussion of fabrication techniques
J. A. Ayres	8-2,10-53	Argonne Nat'l. Lab. Battelle Memorial Institute Iowa State College	Consultations on Coatings and Corrosion problems
R. L. Andelin	8-1,13-53	Knolls Atomic Power Laboratory	Discussion of electroplating
E. A. Eschbach	8-3,10-53	Battelle Memorial Institute Ames Laboratory	Consultations on Fuel Element Development
J. W. Lingafelter	8-3,10-53	Battelle Memorial Institute	Welding Consultation
G. E. McCullough	8-14,22-53	Brush Beryllium Co. Fernald	Discussion of alloys and Metal Quality Program
W. T. Kattner	8-16,21-53	National Lead of Ohio	Metal Quality discussion

URANIUM QUALITY

Uranium Reduced from UF6 Parent Material

The laboratory evaluation of this uranium is complete and was reported last month. The production test for this uranium provides for the irradiation of approximately 1400 eight-inch slugs. This test is being circulated for approval signatures.

Uranium Rolling

Study of quality control samples from the May production rolling at Fernald shows this rolling to be comparable to previous rollings in 1953.

Triple-dip canning was essentially completed on the production test to evaluate the quality of slugs from rods rolled at Fernald. The canning of a few thousand four-inch slugs was postponed in order to complete the lead-dip canning of the slugs from beta transformed rods, Production Test 313-105-25-M.

Approximately 300 four-inch slugs machined from rods rolled in the high alpha phase have been lead-dip canned. These slugs are scheduled to be charged in the piles during September to determine their stability under pile irradiation. A supplement to this test is in rough draft form. The purpose of the supplementary test is to establish whether eight-inch slugs from high alpha rolled rods have sufficient dimensional stability for pile exposure to 1000 MWD/T.

Studies of Defective Uranium

A formal report was prepared describing the effect of striation in the cores of uranium slugs upon the quality of triple-dip canned slug assemblies.

Studies of the causes of rod fracturing and tearing during rolling are being continued. The current work is on six samples of rods rolled from six ingots recast from scrap at Hanford. These rods were so poor that they could not be converted into acceptable slugs.

Transformation and Heat Treatment of Uranium

In the course of ultrasonically testing 47,000 slugs from rods beta heat treated at Fernald, 137 slugs were rejected. Study of these rejects established that forty were partially transformed. The evidence indicates that the incomplete transformation was due to insufficient submersion of the rods in the salt bath. The remaining ninety-seven reject slugs were completely transformed but were rejected because they had a grain size smaller than that typical of beta transformed material. Unusually large amounts of iron, silicon and aluminum are believed to be the cause of the smaller grain size in these slugs. A detailed report of this investigation is being issued.

Preliminary trial runs of the Tocco unit for the induction heat treatment of uranium rods indicates the equipment is generally satisfactory. A steel cone is being fabricated to be attached to the quench ring in order to better guide the rods to

the drive rolls. It is expected that this work will be complete so that heat treatment of the ten tons of rods received from Fernald may begin in September.

URANIUM DEVELOPMENT

Fabrication of Uranium

Uranium produced by powder metallurgical techniques possesses a fine grained randomly oriented structure and should be dimensionally stable under irradiation. In anticipation of receipt of an additional 1000 pieces from Sylvania Electric Products Company in September, a preliminary test to determine the optimum canning conditions for the pilot plant produced uranium powder metal compact slugs has been run. Of the fifty-two pieces canned in this test, five were rejected. Examination of mechanically stripped slugs from this test showed them to be completely wet by Al-Si.

As a result of economic gains possible through the use of derbies as source material in the Sylvania process, compacts made directly from derby metal are being evaluated. Results of chemical analyses of samples of "derby compacts" has shown them to be lower than "ingot compacts" in both carbon and nitrogen. The density of the "derby compacts", as determined by tests run on five slugs, is higher than ordinary compact slugs and comparable to rolled metal.

The study of solid alpha extruded rods to determine the suitability of extrusion as a method for producing hollow fuel elements has continued. Metallurgical investigation of the rods received from MIT indicates that extrusion at 500 C and high speed followed by air cooling yields a fine grained structure with a minimum degree of preferred orientation. After removal of the copper jacket from the heavy walled uranium tubing, alpha extruded by Bridgeport Brass Company, the outside surface appeared heavily serrated while the inside surface was relatively free from these serrations.

Investigation of uranium rods cast at Iowa State College has been started. The surfaces of the as-received rods were generally good. Metallographic investigation showed a grain size variation between the top and bottom of the rods. Density determinations showed little variation between the top and bottom of the rods. Density determinations showed little variation from normal production uranium.

Fabrication of an extensive series of uranium standards with varying grain sizes, for use in conjunction with the ultrasonic testing unit which will be installed in the 3730 Building, has been started. By variations in the conditions of heat treatment, a complete coverage of grain sizes from as-rolled to gamma treated will be made. In addition to their ultrasonic application, these standards will be used in an attempt to quantitatively correlate the macro and micro structures of uranium.

Uranium Alloys

Grain refinement in uranium may be accomplished by small additions of alloying elements. Forty-one eight-inch slugs of uranium plus 0.32 atomic per cent chromium alloy, rolled and machined at Fernald from billets cast at Hanford, have been received.

All these slugs exhibit severe surface cracks and are not acceptable for canning. Results of the preliminary work on the evaluation of silicon alloys indicate that the optimum addition for grain refinement is 1.0 to 1.5 atomic per cent silicon. Four 500 pound billets of this alloy will be cast in the near future.

CANNING TECHNIQUES

Improved "C" Type Slug Canning

Poor bonds between the cap and can wall required rejection of approximately 40 per cent of some 200 "J" type slugs canned with an Al-Si brazed cap. The defect is observed as an unacceptable void in the braze at the faced surface and is presumed to be due to entrapped air which lodges at the side of the cap. The total yield, 50 per cent for these 200, is expected to increase to 60-65 per cent for an additional 54 pieces yet in process. Further improvement is expected. Of approximately 200 slugs previously canned by this method, this defect was observed in seven to eight per cent of the pieces.

Lead-Dip Canning

The lead-dip canning, under production test, of about 55,000 eight-inch slugs was completed. Canning yield improved during the three weeks' use of the process from 76 per cent for the first week, to 84 for the second and 91 for the third. Canning yield during triple-dip production prior to the test was approximately 78 per cent. Objectionable porosity (voids) in the Al-Si bonding layer of the lead-dipped slugs seems more characteristic of the lead-dip process than of triple dip, and was generally detected in poor bond and frost test rejected pieces. The per cent of slugs rejected due to porosity decreased during the test run, averaging approximately four per cent during the last week.

Mechanized Canning

An evaluation of uniformity and quality of machine canned slugs is in process using 300 machine canned pieces and for comparison, 300 manually canned pieces.

The use of a shallow groove roller-cut in the outside can wall surface near the open end is successfully preventing Al-Si "slop-overs."

Tru-Line Slugs

Approximately 950 tru-line slugs were canned by the lead-dip process with a satisfactory yield of 78 per cent. Twenty-four tubes were charged with tru-line slugs at C Pile, August 10, bringing the total of tubes charged to twenty-eight.

FABRICATION TECHNIQUES

Hot Press Canning Program

A flow tube corrosion test of hot pressed canned, Al-Si bonded, slug samples has been started. The test, scheduled for six weeks duration, will be completed the latter part

of September. It will indicate the corrosion suitability of hot pressed slugs for in-pile tests.

One of the features of a hot press slug is the diffusion type closure which is obtained along the entire interface between the cap and can wall. To date a one-eighth-inch extrusion of the cap and can wall produces the most satisfactory weld. Microscopic examination of an interface of a slug produced in this manner revealed good welding. Attempts to peel or chisel the can wall from the cap were unsuccessful.

One of the two Al-Si molded slugs being corrosion tested in boiling water failed after 209 hours. The failure occurred at the slug end which had been originally unbonded. The second specimen appears to have an unbonded end at this exposure.

An alternate method of hot press canning slugs (presently accomplished with hydraulic presses) utilizing the differential thermal expansion of the uranium and steel has been devised. The die components for the test phase are being fabricated.

Cold Press Canning Program

Several mechanically bonded slugs with closures effected by inert arc welding followed by a two-stage hot pressing technique were examined for closure integrity. Photomicrographs show the cap and can to be diffusion welded over the entire interface.

Fabrication of Components

Using the Uniscan operation, 2S aluminum cups with a 100 mil wall have undergone wall thickness reductions of 75 per cent and cup length increases of 350 per cent. Despite a non-uniform wall thickness with a threaded finish, it was apparent that this process could be used to fabricate prototype cans.

Fuel Feasibility Studies

A group of thirty chromium plated slugs have been received from BMI for evaluation of the coatings. The results indicate that the coatings have excellent adherence and resistance to mechanical shock in the as-received condition. However, the 0.4 mil coatings do not cover the slugs as completely as do the 1.6 and 4.4 mil coatings.

TESTING

Al-Si Penetration

Two important changes in the electronic equipment for the Al-Si penetration test were made to increase the reliability of the alarm system, and to improve the temperature stability. Mechanical equipment for the prototype production model is near completion. This equipment includes a new probe mounting, slug actuated switches to eliminate the false tripping on entry to and from the probe, a new test tank and gear drive.

Unbond Test

Work with the ultrasonic unbond test has shown that it is erratic and unreliable in the detection of #4 frost test rejects. The large variation between settings for testing of four-inch and eight-inch slugs cannot be explained in terms of a simple theory. Considerably more development work must be done to make this test applicable to production use.

Because of these difficulties, work was begun to evaluate the radiometric flaw detector which was developed by the General Engineering Laboratory.

Ultrasonic Transformation Test

The ultrasonic grain size test has now been used to test about 50,000 slugs for transformation under production test 313-105-25-M. Minor difficulties were encountered during the testing but, in general, it appears that this test is readily adapted to production use. Some incompletely transformed slugs were rejected by the instrument in the course of the test.

COATINGS AND CORROSION

Flow Cup Laboratory

Samples of zirconium and different types of aluminum have been placed in the Flow Cup Laboratory for weight loss and solution potential measurements. These tests, which will last from one to six months, are the first of a large number which will be made in this laboratory.

Corrosion Studies

A modification of the rotogenerator has been built and is being tested. The changes in the drive mechanism and in the probe will permit the attainment of greater accuracy in measurement.

An abrasion tester consisting essentially of a sand blasting unit has been tested. Preliminary results indicate that with slight modifications this instrument may be accurate to within one per cent.

A sample of a process tube having a shallow orange peel roughness on the ribs was tested in the Flow Cup Laboratory and by a standard corrosion test. None of the results indicates that this tube would be unsatisfactory in use.

Potential measurements designed to give some information about the stress corrosion tendencies of various alloys have continued during the month. No change in electrode potential was noted until after an appreciable linear deformation was given to the sample. It was also noted that this difference in potential, sometimes as great as 0.75 volt, decayed with time, the rate of decay differing markedly with different samples. It is planned to make additional studies to determine whether these effects are caused by some intrinsic difference in the metal itself or is due

to some difference in the oxides at the surface; these additional studies will also help to determine whether these observed effects may be related to the tendency of the metal to corrode under stress.

Studies have shown that treatment in the water autoclave is as valid a test for defective slugs as treatment in the steam autoclave, and further that the film formed in water is superior to that formed in steam at the same temperature and pressure. Studies of films formed at different temperatures and under varying conditions are being continued.

Anodized Films

The anodized slugs in the pile have continued to corrode at the same rate as the anodized control slugs. The only difference between these and regularly charged slugs is that for the anodized slugs there are no gouges or pitting which can be charged to in-pile corrosion.

Studies have shown that anodized films are readily destroyed by exposing to steam at 90 psi but are surprisingly stable on exposure to water at the same temperature and pressure.

Electroplating

Cans have been plated with 0.0005-inch thick coating of nickel or copper and have been canned by a cold-drawing procedure. The results were disappointing in that there was no apparent mechanical bonding. These and previous results indicate that nickel or copper sweater coatings for mechanically bonded slugs are unsatisfactory.

Samples of uranium have been plated with copper or nickel. Modifications of the procedure using a pyrophosphate bath gave a satisfactory copper plate. For the nickel plating a concentrated nitric acid bath gave superior results. Some progress on plating zirconium with nickel was made during the month.

Gas Content of Uranium

Several uranium wafers have been analyzed for gas content. The results averaged 0.58 cc gas per cc uranium; this corresponds to 53 cc per four-inch slug. One slug was analyzed to give 17 cc gas; the difference between these two values is believed to be due to the difference in heat treatments for the wafers and for the slug.

FUEL EXAMINATION

Slug Examination

Weight loss data were made available on slugs which were irradiated to investigate the use of anodic films as protection from damage by corrosion and handling.

The possibility of tube boiling was indicated by the heavy scale observed on the ends of enriched slugs after an exposure at 446 MWD/T at C Pile. No evidence of

thermo-galvanic corrosion was observed at the junction of the enriched pieces and the control pieces.

Fernald "as machined" slugs appear to compare favorably with "simulated Hanford" and normal Hanford production slugs as far as in-pile behavior is concerned. These slugs received an exposure of 506 MWD/T.

The first discharge of slugs irradiated to compare the pile behavior of triple-dip canned uranium slugs machined from rods rolled by Fernald with slugs of the present Simonds production metal did not reveal anything unusual.

Results of an investigation to determine the possible error which might be introduced during the weighing of thermally hot slugs in air indicates that the weight loss can be as high as 40 mg.

A mixture of five per cent phosphoric and two per cent chromic acids will be used as a basis for the design of the slug cleaner to be installed in the 100-C basin. This decision was expressed after an investigation of various commerical and non-commercial solutions.

- Slug Examination Facilities

The prototype slug handling dolly was received from GEL and is being assembled in Building 189-D.

The installation of the slug cleaner in the 105-B basin is expected this month which will allow routine examination of irradiated material in this needed facility.

The completion of an access road to the 305-A Building permitted the pre-exposure examination personnel and facilities to move to this building from 100-B Area.

LABORATORY ENGINEERING

Buildings and Grounds

A slight increase in the tempo of Laboratory Area construction was noted during the month. The Mechanical Development Building Phase II (interior finishing), was accepted with minor exceptions on August 25 and the move of shop equipment into the building was immediately started. Contractor forces will be increased in the Pile Research and Development Building in attempt to complete this facility by November 1, 1953. Progress continued to be slow in the Radiochemistry Building where considerable difficulty is being experienced in fitting the Martin-Parry partitions. It now appears that these partitions cannot be fitted to meet the specifications. Improvised methods for improving the rigidity are being employed in an attempt to provide an acceptable job.

Preliminary drawings and specifications covering the Fuel Element Pilot Plant have been received from Bouillon & Griffith of Seattle, Washington for review and comment.

Glass and Photography Shops

Work in these shops continued routinely.

INVENTIONS

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

G E McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

MEDICAL DEPARTMENT

AUGUST 1953

General

Personnel Changes

The roll decreased from 248 to 243.
The decline is due to inability to secure nursing replacements, and resulted in a great deal of overtime in spite of the low patient census current at this season.

Visits

Mr. Bakko attended the annual meeting of the American Hospital Association at San Francisco.
Dr. Sachs attended the annual meeting of the Washington Public Health Association in Olympia.
Visitors from the State Department of Health included: the advisory general sanitarian, regarding mosquito control, advisory milk sanitarian, dental health consultant and nursing consultant.

Employee Relations

Employee attendance at 25 employee relations meetings was 317.
The Medical Director held a series of four information conferences which were attended by about 160 employees.

Industrial Medicine

Employee physical examinations increased from 1044 to 1295. Dispensary treatments decreased slightly from 4605 to 4437.
Two major and one sub-major injuries were sustained by General Electric employees while no injuries were sustained by contractor employees who receive industrial medical service from us.
Care of the eyes was the monthly health topic.
Sickness absenteeism was 1.32% as compared with 1.17% in July while total absenteeism was 2.02% as compared with 1.72% in July. Absenteeism, all causes, year to date, was 2.41% as compared to 2.45% for the same period in 1952.
A statistical study of visits to the area dispensaries for a six year period and sampling 10% of the dispensary records gave the following results: About 5% of employees who may be considered as chronic visitors have more than three occupational injuries per year. Employees with more than three industrial injuries may be given special counseling in an effort to reduce accidents.
It was further found that 10% of employees sustained 60% of the occupational injuries treated in the dispensaries.
Visits for occupational injury treatment were about equal in number to visits for treatment of personal illness or injury.

Kadlec Hospital

The average daily adult census increased from 72.4 to 78.8 as compared to 73.3 a year ago. This represents an occupancy percentage of 74.4 on the mixed services.
In spite of the low census which is usual at this time of the year the nursing hours per patient day were low due to inability to secure the necessary number of nurses.

Public Health and Welfare

Communicable disease incidence dropped 45% to an all time low. Pre-school examinations were conducted by public health teams assisted by local physicians. A total of 570 children received screening physicals, immunizations and parents

MEDICAL DEPARTMENT

AUGUST 1953

[redacted]

MEDICAL DEPARTMENT

AUGUST 1953

Industrial Medical Section

The number of medical examinations increased from 1044 to 1295. The number of dispensary treatments decreased from 4605 to 4437. General Electric employees sustained 2 major injuries and one sub-major. Contractor employees sustained no major or sub-major injuries. The new 700 Area station rendered 176 treatments during the month. A project proposal was completed for the improvement of dispensary facilities in the 200 East Area.

A dispensary visit study was completed by the Statistics Unit during the month, with the objective of learning more about the employees who visit the dispensary most often. About 5% of employees were found to have more than 9 personal visits per year and 1% make more than 12 visits. About 15% of the employees make no visits to the dispensaries in a one-year period. Of those visiting the dispensary it was found that 65% can be expected to visit for personal reasons in any one year and about 30% for job connected injuries. When repeat visits are tabulated, however, the number of job connected visits and personal visits are about equal. About 19% of those considered to be chronic with respect to personal visits were found to be chronic with respect to job connected visits. Employees with more than ten years of service and less than three, were found to have the highest average number of personal first visits. For personal and job connected visits, those employees of ages 28 through 31 were found to have a higher average of first visits. For job connected injuries, employees of ages 38 through 41 had a high number of first visits.

One information meeting was held during the month for industrial physicians. One industrial physician will resign in November to return to Portland.

The Health Activities Committee met on August 19th and the health topic on "See For Yourself" was presented. This topic dealt with eyes and vision and what employees can do to protect their vision. The sickness absenteeism was 1.77% to date for this year as compared with the 1952 year to date rate of 1.72%. The sickness absenteeism for August was 1.32% as compared to 1.17% for July. It now seems possible that we can improve last year's record which is our goal for the Diamond Jubilee year.

Net costs for July totaled $37,793 as compared with $37,405 in June, an indicated increase of $388, or 1%. The full effect of the last general wage adjustment was felt for the first time in July costs which accounted for the increase in salary and related continuity of service expense($2,045). A decrease in maintenance work ($1,140) offset in part the increase in salaries.

Costs-Operations	July	June	Increase (Decrease)
Salaries	$32,748	$30,890	$ 1,858
Continuity of Service	3,275	3,088	187
Laundry	291	287	4
Utilities, Transportation, Maintenance	4,823	5,963	(1,140)
Supplies and Other	6,545	6,575	(30)
Total Gross Costs	47,682	46,803	879
Less: Revenue	1,371	1,034	337
Expense Credits	8,518	8,364	154
Net Cost of Operation	$37,793	$37,405	$ 388

1205952

Industrial Medical Section (Continued)

Costs-Operations (Continued)

Actual costs approximated very nearly budgeted expectations for the month of July. Actual costs were $37,793 as compared to a budget of $37,625.

Costs-Construction

Gross costs for July amounted to $696 and represented the same level of costs as in June. The entire expense was incurred by two clerical people preparing records for storage. Details of the costs are as follows:

	July	June	Increase (Decrease)
Salaries	$577	$535	$ 42
Continuity of Service	56	53	3
Supplies and Other	63	60	3
Total Gross Costs	$696	$648	$ 48

MEDICAL DEPARTMENT

AUGUST 1953

Industrial Medical Section (Continued)	July	August	Year to Date
Physical Examinations			
Operations			
Pre-employment	101	99	705
Rehire	11	8	144
Annual	268	452	2870
Interim	240	278	1652
A.E.C.	24	53	281
Re-examination and rechecks	224	179	1180
Termination	106	153	938
Sub-total	974	1222	7770
Contractors			
Annual	25	10	46
Pre-employment	7	1	698
Rehire	0	0	121
Recheck	5	12	218
Termination and Transfer	33	50	861
Interim	0	0	87
Sub-total	70	73	2031
Total Physical Examinations	1044	1295	9801
Laboratory Examinations			
Clinical Laboratory			
Government	110	155	1190
Pre-employment, Termination, Transfer	2322	2108	22346
Annual	1902	2987	18347
Rechecks (Area)	1203	1349	9165
First Aid	15	8	63
Clinic	258	271	3173
Hospital	4281	4500	39891
Public Health	1	6	77
Total	10092	11384	94252
X-Ray			
Government	22	48	225
Pre-employment, Termination, Transfer	161	124	1812
Annual	500	746	3878
First Aid	118	102	834
Clinic	188	188	1724
Hospital	310	265	2830
Public Health	7	5	47
Total	1306	1478	11350
Electrocardiographs			
Industrial	82	55	417
Clinic	2	3	20
Hospital	41	34	399
Total	125	92	836

MEDICAL DEPARTMENT

AUGUST 1953

Industrial Medical Section (Continued)	July	August	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	395	412	2982
Occupational Case Retreatments	1259	1241	10046
Non-occupational Treatments	2608	2462	21161
Sub-total	4262	4115	34189
Construction			
New Occupational Cases	91	82	1075
Occupational Case Retreatments	194	175	3215
Non-occupational Treatments	28	27	971
Sub-total	313	284	5261
Facility Operators	30	38	330
Total First Aid Treatments	4605	4437	39780
Major Injuries			
General Electric	1	2	8
Contractors	0	0	2
Total	1	2	10
Sub-major Injuries	1	1	10
Contractors	0	0	11
Total	1	1	21
Absenteeism Investigation			
Calls Made	10	9	57
Employee Personal Illness	9	8	48
No. absent due to illness in family	0	0	1
No. not at home when call was made	1	1	7

MEDICAL DEPARTMENT

AUGUST 1953

Hospital Section

The average daily adult census increased from 72.4 to 78.8, as compared to 73.3 a year ago. This represents an occupancy percentage of 72.3, broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 74.4; Obstetrical Service 63.3. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	48	89
Obstetrical Service	7	20
Total Adult	55	104

The average daily newborn census decreased from 12.2 to 11.6, as compared to 13.6 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.38
Obstetrical	3.44
Newborn	3.10

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of July was 2.27. When newborn infants are included, the ratio is 1.94.

The net expense for the operation of Kadlec Hospital for July was $28,454, as compared to $37,947 for June. Summary is as follows:

Kadlec Hospital net expense $28,454

This represents a reduction of $9,493 due primarily to increased revenue and less maintenance work being performed. Costs were reduced $4,760, revenue increased $5,644 and expense credits decreased $911. The above increase in revenue occurred in spite of a slight reduction in patient census, since the new rates went into effect on July 1st.

An anesthetist arrived at the end of August as a replacement for one who left us on pregnancy leave at the end of May. With our normal complement of three anesthetists we do not anticipate further overtime will be necessary in this unit.

There were twenty-five employee relations meetings held during August with an attendance of 317. These meetings are summarized as follows:

	Number	Attendance
Hospital	8	62
Public Health	8	69
Industrial Medicine	1	6
General	8	180

MEDICAL DEPARTMENT

AUGUST 1953

Hospital Section (Continued)	July	August	Year to Date
Kadlec Hospital			
Average Daily Adult Census	72.4	78.8	87.0
Medical	20.5	24.7	26.4
Surgical	30.0	32.2	33.9
Pediatrics	9.4	8.6	13.6
Mixed	59.9	65.5	73.9
Obstetrical	12.5	13.3	13.1
Average Daily Newborn Census	12.2	11.6	12.4
Maximum Daily Census:			
Mixed Services	80	89	108
Obstetrical	19	20	23
Total Adult Census	92	104	120
Minimum Daily Census:			
Mixed Services	35	48	35
Obstetrical Service	8	7	6
Total Adult Census	43	55	43
Admissions: Adults	517	499	4691
Discharges: Adults	520	518	4697
Newborn	81	84	636
Patient Days: Adult	2245	2443	21152
Newborn	378	359	3006
Total	2623	2802	24158
Average Length of Stay: Adults	4.3	4.7	4.5
Medical	3.7	5.2	4.5
Surgical	5.2	4.1	4.7
Pediatrics	3.8	3.8	4.2
Mixed	4.4	4.8	4.5
Obstetrical	4.1	4.2	4.3
Newborn	4.7	4.3	4.7
Occupancy Percentage: Adults	66.4	72.3	79.8
Medical	55.4	66.8	71.4
Surgical	93.8	100.6	105.9
Pediatrics	49.5	40.5	72.6
Mixed	68.1	74.4	84.0
Obstetrical	59.5	63.3	62.4
Newborn	46.9	44.6	47.7
(Occupancy Percentage based on 109 adult beds and 26 bassinets.)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.38		
Obstetrics	3.44		
Newborn	3.10		
Avg. No. Employees per Patient (excluding newborn)	2.27		
Operations: Major	88	89	774
Minor	117	93	775
E.E.N.T.	34	34	480
Dental	1	3	7

MEDICAL DEPARTMENT

AUGUST 1953

Hospital Section (Continued)	July	August	Year to Date
Kadlec Hospital (Continued)			
Births: Live	75	80	631
Still	2	2	11
Deaths	3	4	36
Hospital Net Death Rate	.17%	.17%	.19%
Net Autopsy Rate	33.3	0	25.0
Discharged against advice	1	1	5
One Day Cases	129	89	1131
Admission Sources:			
Richland	73.7	74.1	76.7
North Richland	13.7	12.2	10.6
Other	12.6	13.7	12.7
Admissions by Employment:			
General Electric	69.8	73.6	73.4
Government	3.9	3.6	2.8
Facility	5.4	3.2	3.9
Contractors	14.9	12.6	12.2
Schools	1.7	1.8	1.8
Military	.0	.2	.5
Others	4.3	5.0	5.4
Hospital Outpatients Treated	529	516	3824
Physical Therapy Treatments			
Clinic	191	95	2044
Hospital	83	64	1237
Industrial: Plant	358	171	2118
Personal	11	0	60
Total	643	330	5459
Pharmacy			
No. of Prescriptions Filled	2481	2492	22576
No. of Store Orders Filled	510	511	4258
Patient Meals			
Regulars	3655	3714	31568
Children under 8	257	285	3860
Specials	1262	1296	11793
Lights	0	3	8
Softs	776	1247	8683
Tonsils	49	41	883
Liquids	148	192	1776
Surgical Liquids	104	79	869
Total	6251	6857	59440
Cafeteria Meals			
Noon	1997	1737	15292
Night	350	338	2410
Total	2347	2075	17702

MEDICAL DEPARTMENT

AUGUST 1953

Public Health Section

A reduction of 45% was noted in the number of communicable diseases reported. Several cases of whooping cough were reported among two Richland families in the same neighborhood, one of which had just moved in from North Richland, where exposure is believed to have occurred. Attempts to inform parents about the importance of immunization are continuing.

Pre-school roundups were conducted in all elementary schools in Richland and North Richland. A total of 570 children received screening, physicals and immunizations, and their parents were interviewed in individual conferences. Instructions on nutrition and dental health were given the parents.

Visitors to the section this month from the State Department of Health included: Mitchell Mondala, Advisory General Sanitarian, who consulted with us about the mosquito control problem in the outlying areas; L. O. Tucker, Advisory Milk Sanitarian, who came in to make plans for a milk survey later in the year; Miss Mary Marshall, Dental Health Consultant, who assisted with the pre-school roundup; and Miss Hazel Furman, Nursing Consultant, who interviewed parents for an immunization study she is making.

Miss Kathleen Leahy, of the University of Washington, visited the department in connection with the Field Training given Dorothy Guild.

The Health Officer attended the annual meeting of the Washington Public Health Association at Olympia, where he presented one of the Section's programs, and reported in the general meeting. Now president-elect, he is scheduled to assume the presidency in January. The health educator was elected Secretary of the Association.

Thirty-five Grade A dairy farms were inspected with satisfactory results. Two milk producers were degraded for failure to meet minimum bacteriological standards.

Numerous nuisance investigations were made in the village relative to insanitary conditions existing in yards. Two citations were issued for illegal dumping of trash and garbage.

The mosquito control problem was hampered by breeding outside our control area. With the help of State and County sanitarians, the offending property owners were contacted and advised about control measures. Through their cooperation in draining and water control, the problem was quickly brought under control. A total of 1600 gallons of insecticide was used in larviciding and fogging.

Among other cases closed with satisfactory results, by social service, were two serious cases of personality adjustment. Both were cases carried over a long period.

The pre-school roundups resulted in 60 referrals by Public Health nurses. Since this load would be too great to absorb, group interviewing is planned.

MEDICAL DEPARTMENT

AUGUST 1953

Public Health Section (Continued)	July	August	Year to Date
Education			
Pamphlets distributed	10,989	12,995	88,939
News Releases	6	6	82
Staff Meetings	1	0	10
Classes	12	13	84
Attendance	39	56	603
Lectures & Talks	5	7	91
Attendance	76	380	3,729
Films Shown	12	6	154
Attendance	225	128	4,507
Community Conferences & Meetings	17	44	324
Radio Broadcasts	0	0	9
Immunizations			
Diphtheria	0	8	94
Diphtheria Booster	1	170	506
Tetanus	0	7	149
Tetanus Booster	1	139	577
Pertussis	0	7	25
Pertussis Booster	1	128	267
Smallpox	0	88	176
Smallpox Revaccination	2	211	985
Tuberculin Test	17	12	111
Typhoid	0	3	3
Typhoid Booster	1	0	1
Immune Globulin	8	6	45
Other	0	3	53
Social Service			
Cases carried over	87	89	679
Cases admitted	20	15	120
Cases closed	18	11	105
Remaining case load	89	93	694
Activities:			
Home Visits	27	14	101
Office Interviews	298	237	2,354
Conferences	58	40	407
Meetings	6	0	50
Sanitation			
Inspections made	236	255	1,367
Conferences held	12	38	183
Bacteriological Laboratory			
Treated Water Samples	244	276	1,756
Milk Samples (Inc. cream & ice cream)	38	34	312
Other bacteriological tests	430	344	3,830
Total	712	654	5,898

MEDICAL DEPARTMENT

AUGUST 1953

Public Health Section (Continued)	July	August	Year to Date
Communicable Diseases			
Chickenpox	16	3	236
Diphtheria	1	0	2
Erysipelas	0	0	1
Food Poisoning	0	0	29
German Measles	11	8	65
Gonorrhea	7	10	78
Impetigo	1	0	7
Influenza (U.R.I.)	0	0	4
Measles	28	5	74
Mumps	6	9	293
Pinkeye	0	0	9
Poliomyelitis	1	0	2
Ringworm	0	2	8
Roseola	0	0	1
Salmonellosis	0	0	4
Scabies	0	0	1
Scarlet Fever	0	0	54
Syphilis	0	0	13
Tuberculosis	0	0	5
Whooping Cough	10	8	18
Total	81	45	904
Total No. Nursing Field Visits	595	712	6025
Total No. Nursing Office Visits	37	39	615

[redacted] HW-29229

Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

AUGUST 1953

Summary

Fourteen informal radiation incidents and eight Class I incidents were reported. There was no Class II incident for the first time this year.

Problems connected with excessive releases of active materials from the Redox plant continued.

There was no official resolution of the enigma of the radioactive particle showers over the Pacific Northwest for July and early August. In late August, more intense showers clearly related to the announced Russian test were detected.

In research and development, significant items were a re-evaluation of fast neutron film response for the specific case of emission from some plutonium salts, which led to an increase in the apparent hazard, and the initiation of ruthenium metabolism work, to derive a more factual limit for permissible ruthenium release.

Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

AUGUST 1953

Organization

The month end force of 364 included 28 supervisors, 104 engineers and scientists, 18 clerical, and 214 other personnel.

Number of Employees on Payroll		
Beginning of month	-	364
End of month	-	364
Net change	-	0

Although the net force was unchanged, the turnover rate was unduly high (4.1%), due to the combination of several terminations for return to school with four planned reductions in particular phases of the program.

General

The number of radiation incidents decreased to 22, with no Class II incident for the first time since November, 1952.* Of the Class I incidents, the one of widest importance concerned a repetition of the emission of large flakes of contaminated ammonium salt crystals from the Redox stacks. Of major significance was the proximity of this phenomenon to the intended radiation-free construction work of a tank farm.

---

* Actually, badge exposures determined after the close of the month revealed one nominal Class II incident of minor significance. By convention, this will be officially recorded in September results.

Radiological Sciences Department

General (Continued)

There has been no official confirmation of this department's implied assignment of cause for the unusual concentrations of radioactive particles throughout the Pacific Northwest. Beginning on August 20, substantially more active showers of particles with shorter half-life (4 - 7 days) appeared. These, at least, were compatible with the announced Russian test of August 12 as the origin.

A general department meeting, including spouses of employees, was held with Dr. H.H. Plough as guest speaker on the timely topic of "Genetics and Ionizing Radiations".

A two-page leaflet of suggestions for appropriate conduct while visiting radiation areas at other locations was issued. The brochure will be made available to employees in travel status through the cooperation of the Traffic Unit of the Plant Auxiliary Operations Department.

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

Inventor	Title
none	none

Radiological Sciences Department

RADIOLOGICAL ENGINEERING

Pond construction at the Aquatic Biology laboratory was completed. The contract for the Positive Ion Accelerator laboratory construction was awarded.

Studies of the new P-10 program indicated serious shielding problems from the new crop of target slugs, whose activation in the reactor is considerably greater than before. Current design is deemed inadequate for permanent operation; some compromises can be legitimately considered for a short-range program.

The Engineering Department has proposed use of hot reactor effluent water as boiler feed to save about $500 per day per powerhouse. While the proposal may ultimately be shown to be sound, it is not evident, without further experiment, that the radiation problems could be adequately controlled. A heat exchanger system would avoid the problems, with some reduction in potential savings.

The evaluation of the eventualities of a major reactor incident was completed.

In reassessing the radium equivalent of the radiation emitted from a nuclear reactor, a major discrepancy between calculations from various sources was noted. This was traced to a numerical error in a much-used early report by J.A. Wheeler. The Wheeler value was equivalent to 24 metric tons Ra per 1000 MW. The new value is 360 metric tons per 1000 MW; the change is essentially a composite of a numerical error by a factor of 10 and revised hazard parameters by a factor of 1.5.

[redacted]

Radiological Sciences Department

RADIOLOGICAL RECORDS AND STANDARDS SECTION

General Statistics	July	August	1953 To Date
Special Work Permits	542	445	3,899
Routine and Special Surveys	1,455	1,335	10,430
Air Samples	1,272	1,524	9,910
Skin Contamination	10	89	160

During dissolving in the 1-E cubicle of the multi-curie wing at the Redox laboratory, dissolver solution was drawn into the instrument lines and rotameter on the operating panel board and caused dosage rates as high as 100 rep/hr. Waste from the cubicle produced a dosage rate of 330 r/hr in one section of the tunnel. The condition was observed when it occurred and personnel were evacuated before appreciable exposure occurred. The incident is being investigated to determine how the equipment can be redesigned to prevent recurrence of such a condition.

Rehabilitation work at the tritium separations facility continued to result in contamination of personnel. Levels were somewhat less than for the previous month.

Extensive surveys were required in the vicinity of the Redox area when the particle emission from the stack showed a substantial increase. Much of the contamination was in the form of large chunks of material analyzed as ammonium salts. There was no evidence of any particle spread to the nearby Construction areas.

2. Radiological Standards

There was no Class II radiation incident reported. Eight Class I and fourteen Informal radiation incidents were investigated.

The Class I incidents included: the increased particle emission from the Redox stack; the high radiation levels reported in the 1-E cubicle at the Redox laboratory; potential overexposure in a Reactor area resulting from a defective survey meter; evidence of tampering with two survey meters; an incident involving batch size; exposure of several Reactor employees to unmonitored pieces in a process tube; failure of a Reactor employee to wear personnel metering equipment while performing radiation work; and the contamination of an employee at the 234-5 building.

[redacted]

3. Exposure Records

[redacted]

During the first six months of 1953, about 65 General Electric employees showed an accumulated whole body gamma exposure of more than 1 roentgen. More than 100 General Electric employees showed a beta exposure greater than 1 rep.

General Statistics

	July	August	1953 To Date
Gamma pencils read	202,442	210,258	1,786,244
Potential overexposures	7	8	71
Confirmed overexposures	0	0	6
Slow neutron pencils read	992	968	9,112
Potential overexposures	1	1	11
Confirmed overexposures	0	0	0
Beta-gamma film badges processed	36,219	35,233	303,847
Potential overexposures	26	19	313
Confirmed overexposures	1	0	18
Fast neutron badges processed	505	478	4,131
Potential overexposures	0	0	0
Confirmed overexposures	0	0	0
Lost readings (all causes)	41	16	293

(b) Bioassay

1. Plutonium Analyses

About 75% of the special slides used for exposure of the electrodeposition plates were found to be faulty. This resulted in a considerable delay in the final step of the plutonium analyses of many

Radiological Sciences Department

1. Plutonium Analyses (Continued)

All resamples above detection limit are under investigation.

2. Fission Product Analyses

	July	August	1953 To Date
Samples assayed	692	551	5,099
Results above 10 c/m/ sample	1	8	32*

* Results of special samples were not reported previously.

The eight results above 10 c/m were obtained on personnel involved in earlier radiation incidents; namely, Class I, Numbers 270, 290, and 296.

3. Uranium Analyses

Results of 286 samples were as follows:

METAL PREPARATION - 300 AREA

	End of 4th Day Exposure /ug/liter			End of 2 Days-No Exposure /ug/liter		
Job Description	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Canning	45	5	28	29	4	22
Machining	51	16	5	25	13	4
Melt Plant	11	4	8	8	4	6
Material Handling	62	13	15	27	7	11
Testing	6	3	4	--	--	--
Coverage	7	3	6	5	2	6
Special products	14	4	10	2	2	6
Finishing	6	4	11	12	3	8
Technical	16	3	15	4	3	10
Slug Recovery		8	5	5	5	1

	Before Job			After Job		
	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Car unloading	-	-	-	181	23	24
Random samples	2	1	6	-	-	-

Radiological Sciences Department

3. Uranium Analyses (Continued)

	Miscellaneous Samples			
	Maximum	Average	Number Samples	(μg/liter)
224-U	80	4	75	

4. Tritium Analyses

	<2	2-20	20-35	35-75	>75	Total	1953 To Date
Number of samples	141	114	20	15	0	290	963

(c) Thyroid Checks

All thyroid checks reported were below the warning level.

(d) Hand Score Summary

There were 30,769 alpha and 48,747 beta scores reported. About 0.01% of the beta scores were above the warning level. Decontamination for all high cases was attempted and successful.

4. Calibrations

	Number of Routine Calibrations		
	July	August	1953 To Date
Fixed Instruments	120	130	1,013
Portable Instruments	2,672	2,747	18,020
Personnel Meters	17,411	4,948	79,987
Total	20,203	7,825	99,020

BIOPHYSICS SECTION

CONTROL UNIT

Regional Survey

The general findings are summarized in the following table:

Radiological Sciences Department

Regional Survey (Continued)

SAMPLE TYPE AND LOCATIONS

	Activity Type	Average Activity Density (μc/cc)
Drinking Water		
Benton City Water Co. Well	alpha	1×10^{-8}
Richland, N.Richland, Benton City Wells	alpha	< 0.5 to 1.7×10^{-8}
100 Areas	beta	< 0.5 to 2.0×10^{-7}
Pasco, Kennewick, McNary Dam	beta	< 0.5 to 2.0×10^{-7}
Backwash Solids-Pasco Filter Plant	beta	2.6×10^{-2} μc/g
Backwash Liquids-Pasco Filter Plant	beta	4.0×10^{-7}
Sand Filter-Pasco Filter Plant	beta	1.3×10^{-4} μc/g
Anthracite Filter-Pasco Filter Plant	beta	4.2×10^{-5} μc/g
Other Waters		
300 Area Wells #1, 2, 3	alpha	0.6 to 2.0×10^{-7}
300 Area Well #4	alpha	3.4×10^{-7}
Well #4 measured as uranium	U	3.4×10^{-7}
Other wells on the reservation	beta	< 0.5 to 1.9×10^{-7}
Columbia River-Hanford Ferry	beta	5.8×10^{-6}
Columbia River-Below reactors	beta	0.4 to 1.1×10^{-5}
Columbia River-Patterson to McNary	beta	2.5×10^{-7}
Columbia River-Shore mud	beta	0.3 to 1.5×10^{-4} μc/g
Raw water-Operating areas	beta	< 0.5 to 7.1×10^{-7}
Reactor effluent retention basins	beta	3.2 to 4.7×10^{-3}
Reactor effluent retention basins	alpha	< 5.0 to 7×10^{-9}
I^{131} in farm wastes	I^{131}	5×10^{-7}
I^{131} in Columbia River-Hanford	I^{131}	6.4×10^{-8}
Atmospheric Pollution		
Gross alpha emitters	alpha	< 0.4 to 1.9×10^{-14}
Gross dose rate-Separations areas	beta-gamma	0.5 to 2.7 mrep/day
Gross dose rate-Residential areas	beta-gamma	0.3 to 0.6 mrep/day
Filterable beta-Separations areas	beta	1.3 to 8.6×10^{-12}
I^{131} - Separations areas	I^{131}	0.1 to 1.2×10^{-12}
I^{131} - Separations stacks	I^{131}	0.6 curie/day
Active particles-Wash.,Idaho,Ore,Mont.	--	0.2 to 0.5 ptle/m^3
Active particles-Hanford Operations	--	0.07 to 2.2 ptles/m^3
Tritium(as oxides)-Reactor stacks	T	0.5 curie/day
Vegetation		μc/g
Environs of Separations areas	I^{131}	< 0.3 to 1.2×10^{-5}
Residential areas	I^{131}	$< 3.0 \times 10^{-6}$
Eastern Wash. and Oregon	I^{131}	$< 3.0 \times 10^{-6}$
Non-volatile beta emitters-Wash.& Ore.	beta	4.5×10^{-5}
Alpha emitters-Separations areas	alpha	1.3 to 3.4×10^{-7}
Alpha emitters-300 Area	alpha	4.4×10^{-7}

Radiological Sciences Department

Regional Survey (Continued)

The increase in the number of airborne radioactive particles noted in the outer environs during early July continued throughout the remainder of July; average weekly concentrations ranged from 0.2 to 0.8 particle/m^3 at perimeter and remote monitoring stations. Values found in Idaho, Montana, Oregon, and Eastern Washington were not significantly different from those measured in local residential areas. Measurements obtained between August 1 and August 10 showed that airborne particulate contamination decreased to values on the order of 0.1 particle/m^3 at local and remote stations.

Particle monitoring inside manufacturing areas showed excessive airborne concentrations near the 202-S facility where the average concentration over a one-week period was as high as 4.3 particles/m^3. Spot monitoring during the afternoon of August 18 when ammonium nitrate flakes were observed leaving the stack, showed a concentration of 140 particles per cubic meter. Radiochemical analysis of this material showed 70% of the activity due to ruthenium and 25% to rare earths; trace amounts of zirconium, strontium, and barium were also detected. Ground surveys showed CP readings as high as 15 rep/hr in an area directly southeast of the stack inside the 200-West Area perimeter fence. CP instrument readings dropped to several mrep/hr at the perimeter fence. Spot surveys toward the latter part of the month showed a decrease in contamination levels to VGM readings on the order of 500 c/m.

Increases in the activity density of non-volatile beta particle emitters on vegetation were observed in the immediate environs on August 19 and 20. Values on the order of 1 to 5 x 10^{-4} µc/g were general on August 25. Preliminary analyses of decay measurements made on this material indicate a short half-life on the order of 4 to 7 days; the source was believed to be offsite. Coincident increases were also observed in the rain monitoring program. These phenomena were compatible with the arrival of material from the reported Russian test.

Analytical Control Laboratory

Routine analyses were carried out as follows:

Radiological Sciences Department

Analytical Control Laboratory (Continued)

Laboratory	Analyses Completed August	1953 To Date
Type Sample		
Vegetation	1310	10094
Water	1993	14960
Solids	328	2626
Air Samples	455	3017
Uranium (fluorophotometer)	600	4087
Oil fog (fluorophotometer)	116	638
Special survey samples (RMSS)	36	230
Special survey samples (RMU & RS)	18	580
Phillips Petroleum - Tritium in water samples	0	17
Total	4856	36249
Counting Room		
Beta measurements (recounts included)	6285	50670
Alpha measurements (recounts included)	2695	19752
Control points (alpha and beta)	2694	20759
Decay curve points	4275	37723
Absorption curve points	360	2503
Total	16309	131407

Concentrations of Cu^{64} in reactor effluent water at 100-B and 100-H have increased progressively over the past six months to a factor of 1.4 over previous values.

Control Services

A relationship was established between the activity of gross beta particle emitters and the dosage rate from gross gamma ray and beta particle emitters found in the particulate material in the gas stream entering the Redox sand filter; this will permit determination of activity from dosage readings. A dosage of 50 mrep/hr including 0.7 mr/hr measured at the surface of the sampling filter accompanied 1 μc of activity of beta particle emitters within the range 10 to 3000 mrep/hr.

A nomograph was prepared to facilitate determination of the ratio of Ru^{103} to Ru^{106} in fission product mixtures after various irradiation and cooling times.

[redacted] UNCLASSIFIED

Radiological Sciences Department

Synoptic Meteorology

Forecasts	Number made	August Percent reliability
Production	93	83.8
24-hour	62	81.2
Special	72	70.8

The monthly average temperature was 74.0°F which was normal for the month. The highest temperature of the year, 104°F, was recorded on August 15.

Four major thunderstorms during the month contributed to a high monthly total precipitation of 0.96 inches, 0.76 inches above normal. This was the most precipitation during August since 1920.

RESEARCH AND DEVELOPMENT ACTIVITIES

Experimental Meteorology

Two diffusion experiments using a ground source during stable conditions and one experiment using an elevated source during unstable conditions were performed.

The drum sampler for fluorescent pigments was received from Instrument Development, completing the prototype set of fluorescent pigment equipment. Several attempts were made to use this equipment under field conditions. The drum sampler operated satisfactorily and will require only minor modification in the final design. Considerable difficulty was experienced with the dispersing equipment indicating that further development work may be required on these units.

Examination of the atmospheric pollution control program presently in use in the Separations areas re-emphasized the importance of continuous stack monitors measuring the amount of contaminant per unit time in the effluent stream.

Earth Sciences

Rehabilitation of the 222-U and 2707-U buildings for Earth Sciences occupancy began during the month and was about 50% complete at month end. A total of about 20,000 samples of drill cuttings was prepared for transfer to the new location.

Radiological Sciences Department

Earth Sciences (Continued)

Analysis of the patterns of natural sodium concentration in the ground water indicated an area of higher sodium concentration east of the 200-East Area. The available evidence strongly suggests that this is due to the previously reported artesian aquifer beneath the Ellensburg formation discharging into the shallower water table in that area. Confirmation or denial of this belief is exceedingly important because of the effect such a condition may have on the disposal of radioactive and non-radioactive liquid wastes from the Purex plant in that general locality. Additional evidence is being obtained by drilling, sampling, and monitoring.

Completion of the scintillation counter well probe and testing in various wells showed great promise for the equipment.

The radioactive decontamination by soils of ROW wastes containing oxalate, proposed as a substitute for the sulfate in the plant process, was far lower than for similar sulfate wastes. Moreover, the rate of percolation from the oxalate-bearing wastes decreased rapidly compared to that for sulfate-bearing wastes. Thus, the hazards involved in ground disposal of the former compared to that of the latter do not favor its disposal to ground.

The decontamination by soils of simulated RAW wastes spiked with cesium varied only slightly throughout the pH range used in process operations. The volume of liquid to achieve break-through of cesium in a laboratory column increased as the concentration decreased. Some decontamination continued for a far greater number of column volumes following initial break-through for the less concentrated solutions than for the higher.

A field percolation test was made in the Redox area to obtain a firm value for saturated flow percolation rates to permit adequate design of the new Redox sump. A test pit 10 feet deep and containing 160 square feet of bottom area received a carefully metered flow of water from tank trucks for two 3-hour periods; a flow rate of about 160 gallons/square foot/day for a hydrostatic head of one foot was obtained. This figure is well above the present performance of the U-swamp, 6 gallons/square foot/day, but below that calculated for the Redox cribs of about 500 gallons/square foot/day.

Radiological Sciences Department

Industrial Hygiene

A study of TBP stack gas particulates was undertaken to determine the feasibility of by-passing the sand filter for this plant. Fifty filter and impinger samples were collected and at month end were being analyzed for beta and alpha emitter content. Determinations were also being made of the air stream dust loading.

Modification of piping and sampling facilities were completed at Redox for the study of stack gas particulates relative to a proposed sand filter at the Purex plant.

The new sodium chloride generator for the respirator tester was assembled and a number of preliminary samples run for calibration. Electron photomicrographs indicated that the aerosol was easily maintained in the 0.1 μ to 0.2 μ particle size range at concentrations of 1 to 3 mg/cubic meter of air.

Industrial noise level surveys were made in 27 buildings on the project. Of 506 measurements of sound intensity, 77% were above 80 decibels, 35% above 90, and 8% above 100. Noise levels above 90 decibels were found in 19 buildings. The chief sources of these high levels rated in approximate order of importance were: water pumps in process water pump houses, reservoir pump house, and filter plants, exhaust fan cells in reactor buildings; air compressors in power houses, reactor buildings, canyon buildings and fan buildings; and steam whistles, soot blowing, and pop-off valves in power houses. Brief exposures exceeding 100 decibels were found near steam ejectors and whistles, vacuum beakers, and in exhaust fan cells.

Investigation continued of the nitrite method for the determination of oxides of nitrogen. A series of NO_2-air mixtures was analyzed simultaneously by this and by the phenoldisulfonic acid method. Although good checks were obtained within each method, the two methods did not agree well.

Methods

Preliminary tests were made of the Staplex Hi-Volume air sampler for collection of I^{131} using silver nitrate-impregnated fiber glass filters. Satisfactory performance of the pump was indicated at a flow rate of 100 cfm for periods up to five hours, the maximum sampling period used. As little as 1.3×10^{-12} μc I^{131} per cc air was found in the short sampling time of one hour.

Methods (Continued)

Results obtained using the gamma ray spectrometer to differentiate between $Ru^{103-106}$ and I^{131} suggested that it may be feasible to use such an instrument as a part of the constant stack monitor. $Ru^{103-106}$ and I^{131} were easily differentiated when present in concentrations equal to those found in the constant monitor scrubber solution during periods when stack emission rates of these isotopes are one curie and 0.3 curie per day, respectively.

Continued studies of Cr^{51} confirm the presence of an extremely soft radiation undetected by mica window counters but contributing a large fraction of the count in an internal proportional counter. The vanadium X-ray following Cr^{51} K-capture is too penetrating to account for the soft radiation observed unless Auger electrons are emitted as a secondary process. The electrodeposition method was determined to be inapplicable because of the very high self-absorption in the required chromium carrier.

A comparison between the perchloric acid distillation method and the electrodeposition method for $Ru^{103-106}$ in a waste solution indicated that the electroplating method is not as specific as the perchloric acid distillation method.

The river bed temperature probe leads were found damaged beyond repair due to action of high water; efforts to salvage the probe were unsuccessful. The probe was redesigned to minimize the probability of similar future damage and loss.

Tests continued on laboratory proportional samplers using very low flow rates. Variation in the fraction of the total flow sampled became very significant at flow rates below 1/4 gpm. Drawings were prepared for the full scale flow-splitting sampler.

Radiochemical Standards

Self-absorption studies were made for P^{32} in the ash of various aquatic organisms. Only minor differences in the self-absorption factor with sample species were noted.

Studies with K-capture isotopes of Zn^{65}, Cr^{51}, and Fe^{55} using the 4π counter indicated that it is important to have very thin conducting films for mounting, otherwise reproducibility is very poor, and sources generally yield low counts.

In tests to determine the consistency of disintegration rates determined

Radiological Sciences Department

Radiochemical Standards (Continued)

by counting the same source on various shelves of the mica window counter, poor agreement was obtained for the softer emitters, Co^{60}, and S^{35}. Much better agreement was found for RaE, and P^{32}.

The end window proportional flow counter under study for possible replacement of end mica window tubes was found to have excellent plateau characteristics with propane as the filling gas. Several anode configurations were found suitable. Geometry for the same shelf-to-window distance is appreciably higher than for the same size tube used as a mica window counter.

Repeated tritium calibrations using internally filled GM tubes of different lengths gave average values ranging from 90% to 103% of the expected tritium concentration. Reduction of the sample with hot zinc was utilized. The low precision is thought to be caused by lack of homogeneity in the filling mixtures; changes in filling procedures are being studied to correct this condition.

Physics

A CP meter which had been modified to receive beta radiation from approximately a ten times greater solid angle than does a regular CP was calibrated against the Sr^{90} source. Within the range of dose rates that could be used from this source, the response was the same as to gamma rays; thus, such an instrument would be especially useful in mixed radiation fields.

The response of fast neutron personnel monitoring film to the neutrons from a process material (plutonium fluoride) was studied. This was necessary because these neutrons are of much lower energy than those from the usual Po-B calibration source. A significant difference in sensitivity was found. It was also found that a delay before development resulted in a decrease in the measured value of the neutron dose due to latent image fading. The emission of the process material was determined with the BF_3 "long counter". The counter was also used to find the surface dose rate by a method currently being studied for such measurements applying ordinary survey instruments; the result was 3.5 rem/hr.

Certain of the data accumulated during the study of geiger counter age characteristics were reviewed to see if possible alternate descriptions existed. It was found that the relation of the maximum pulse height from a geiger counter to the counting rate is approximately a power law as previously believed, but is also to be

Radiological Sciences Department

Physics (Continued)

represented nearly as well by a logarithmic law within the range of the experimental data available.

Progress was made on the study of electronic circuits for a fast neutron spectrometer and on the preparation for the calibration of the Van de Graaff electron beam.

Instrument Development

A scintillation probe for use with conventional "poppies" was completed and started through laboratory tests. These indicated that the more economical type photomultiplier can be used in such systems without impairing the required performance of 20% geometry with background less than 1 c/m.

Extended tests of the newly developed transistor high voltage supply showed no sign of transistor failure at 90% relative humidity, under which conditions insulator leakage caused three failures, thus indicating that a type CK-722 transistor can be used successfully in routine local service. The finished item provides adequate power to operate a photomultiplier tube for about 500 hours from one set of nine 1-1/2 volt batteries, and, therefore, promises to be a satisfactory solution to the portable high voltage supply problem.

Analysis of time intervals between counts produced by GM tubes showed that two locally fabricated counters whose results were "in control" also gave proper interval analyses. An apparent change in interval distribution with counting rate could not be confirmed.

Literature research toward the design of a telemetering system for central recording of meteorological and radiation data from outlying monitoring stations was completed. Design work was started. The equipment will provide a record of wind velocity and direction and certain radiation background data, which will obviate frequent trips to stations and provide necessary data during any emergency situation.

Radiological Sciences Department

BIOLOGY SECTION

AQUATIC BIOLOGY

Biological Chains

No result.

Ecology

Survey of the Columbia River

The river level continued to recede, improving sampling conditions in the shallow water zone. Average activity densities in the vicinity of Hanford remained at about the same level for plankton and bottom algae, 10^{-2} µc/g and 5×10^{-3} µc/g, respectively, but increased three-fold in small fish to 4.2×10^{-3} µc/g. Caddis fly larvae, representing invertebrates, were significantly high at 9×10^{-3} µc/g. In adult fish, a maximum of 1.8×10^{-2} µc/g of scales occurred in a chiselmouth whose flesh contained 1.2×10^{-3} µc/g. No significant radioactivity levels were found in fish sampled at Priest Rapids. Bottom organisms collected immediately below the 100-D Area were more radioactive than at Hanford, and one small fish (stickleback) contained 1.5×10^{-2} µc/g. These high values result from discharge of a part of the reactor effluent from the 100-D - DR facilities via the emergency overflow flume. Bottom samples from the McNary Pool Area continued to be nearly devoid of aquatic life, but red "blood worms" began to appear.

Effluent Monitoring

Routine monitoring was continued with domestic rainbow trout. Survival of the juvenile fish was good up to 10% strength of both reactor influent and effluent. Growth inhibition occurred when the influent reached 10% concentration. Due probably to higher temperatures, growth was inhibited in effluent concentrations of 5%.

BIOLOGY CONTROL UNIT

Biological Monitoring

Since waterfowl were found to inhabit the contaminated Redox swamp, a limited investigation was initiated to determine the uptake of

Radiological Sciences Department

Biological Monitoring (Continued)

Ru^{106} by fowl. The kidney is apparently the critical organ, and concentrations of ruthenium in it following administration of 260 μc Ru^{106} appear below:

Time of Sacrifice After Administration	μc/Wet g	Fraction of Administered Dose
1 hour	0.065	2.5×10^{-4}
6 hours	0.140	5.4×10^{-4}
24 hours	0.244	9.4×10^{-4}

The uptake in 24 hours was some 50 times the accepted value in humans. Rodent thyroid activity densities decreased to less than one-tenth those of July.

Clinical Laboratory, Microscopy, Electron Microscopy, Radiochemistry

Heavy loads of routine examinations were completed in all these activities.

METABOLISM

Plutonium Absorption and Metabolism

In the experiment on absorption of plutonium from the intestinal tract of rats, in the range 10 to 50,000 x MPC, preliminary results were obtained on the four groups fed the lowest plutonium concentrations:

Pu Concentration (x MPC)	Pu Isotope	Per Cent Absorbed and Deposited
10	238	0.0022
100	239	Not significant
500	239	0.0015
5000	239	0.0030

Very erratic results were obtained from an experiment studying the percutaneous absorption of plutonium in hexone solution. It is believed that the erratic data were due to spreading of the hexone

Radiological Sciences Department

Plutonium Absorption and Metabolism (Continued)

solution over the skin of the rat.

Preliminary data on percutaneous absorption of Pu in the pig, whose skin is most like that of the human, showed low absorption.

Two decontamination procedures which have been employed on the plant were tested on rats. The combination of $KMnO_4$, $NaHSO_3$, and Physohex (an antiseptic detergent), left 4.5% of the plutonium on the skin. This procedure was as effective as any previously tested.

Fission Product Absorption and Metabolism

No result.

Tritium Studies

Based on incomplete analyses of tissues obtained from rats sacrificed one hour after a four-hour exposure to a tritium gas atmosphere containing 200 μc/ml, approximately 70 μc HTO/ml body water was fixed in the animals. Distribution of tritium oxide in the body water from various tissues appeared to be quite uniform. Of the tissues thus far analyzed for organically-bound tritium, liver, kidney, and lung contained about the concentration of bound tritium predicted from the tritium present as body water. Muscle, however, (based on a single analysis) shows twenty times the bound tritium content predicted from previous tritium oxide studies.

Mechanism of Radiation Damage to Plants

Previously irradiated and unirradiated algae cells subcultured in the presence of C^{14} were fractionated into various chemical compounds. No significant difference between irradiated and unirradiated cells was observed in the incorporation of C^{14} into proteins, starch, and cellulose. Nucleic acid production appeared to be slightly greater in the previously irradiated cells. Experiments were started to further explore the effect of radiation on the synthesis of ribonucleic and desoxyribonucleic acids utilizing P^{32} as a tracer.

In final experiments on gross effects, selected, previously irradiated, algal cells were compared with unirradiated control cells as to growth rate in various organic and inorganic media. Several irradiated selections grew more rapidly, in relation to controls, in organic media than in inorganic media, indicating that these cells are possible biochemical mutants. The frequency of such apparent mutations in Chlorella seemed to be quite high.

Radiological Sciences Department

PLANT NUTRITION AND MICROBIOLOGY

Effect of Reactor Effluent on Growing Plants

Barley watered with effluent was harvested; its yield compared to suitable controls was shown to be unaffected. Nitrogen concentration in the seeds was slightly lower in plants watered with 100% effluent, but showed no significant change when 5% effluent was used.

Absorption and Translocation of Radioelements in Plants

An experiment was conducted in the controlled environment chamber to determine the uptake of cerium over the normal life span of the bean plant. It was found that no tissue exhibited a marked tendency to concentrate this ion. The primary leaves attained the highest concentration of aerial tissues at about 1.5 μg Ce/g dry weight. There appeared to be little retranslocation of this ion to new growth if the source of Ce was removed. The values of uptake efficiency agreed with previous work and were similar to those of yttrium.

RBE by Microbiological Methods

In anticipation of completion of the autoturbidimeter, experiments were carried out to correlate optical density with other factors such as cell number, viable cell number, and cell mass. During irradiation with tritium, the size of the individual bacterium changed markedly by the formation of long filaments as much as 50 times the normal bacterial length. Likewise, the number of viable cells dropped markedly, although the optical density continued to rise slowly.

Genetic Effects of Internally Deposited Radioelements

A new experiment to evaluate the mutation rate in *E. coli* induced by P^{32} was initiated. Only samples taken after 20 hours of exposure have been analyzed. No mutation was found in the samples from either the tubes in which P^{32} was metabolized, or from those where it served only as a radiation source.

Radiological Sciences Department

TOXICOLOGY

Experimental Animal Farm (Toxicology of I^{131})

The ratios of I^{131} in the thyroid gland to I^{131} fed daily (Q/q) in August were as follows:

	5 μc/day	1.5 μc/day	0.5 μc/day	0.15 μc/day
Original ewes	2.5			3.8
1950 Offspring	1.3			3.1
1951 Offspring	2.3			2.0
1952 Offspring	3.1			0.2
1953 Offspring	0.8	1.1	1.0	0.9

Blood volume studies were conducted on 3 groups of animals; i.e., normal controls, animals maintained on high level I^{131} intake (240 μc/day), and surgically thyroidectomized animals. No significant difference in the blood volume per unit of body weight between groups was observed.

Skin Beta Burns

At the request of the AEC Division of Biology and Medicine, some short-term experiments were initiated for the purpose of determining the beta dose required to cause a radiation burn on sheeps' skin. Normal skin histology was studied as the first step.

Radioactive Particles, Metabolism and Toxicology

A new microburet for measuring gas samples was constructed and used in preparing gas solutions which approximated in composition that obtained at the end of the alpha-particle irradiation of nitrous oxide. In this way it was possible to evaluate the various methods for measuring the amount of product formed after such an irradiation.

Plutonium Therapy

No result.

FINANCIAL DEPARTMENT MONTHLY REPORT
AUGUST, 1953

Three Financial Department employees were transferred to positions outside the department during the month. W. W. Smith was transferred to Schenectady as contract financial administrator of the Atomic Products Division. A. C. Beltzner, General Cost Unit, left August 31 for Idaho Falls, Idaho, to become head accountant at Arco which is a part of General Electric's Aircraft Nuclear Propulsion Project. N. A. Smith, Engineering Cost Unit, was transferred as of August 1 to the Accountability Section as head of the SF Accounting Procedures and Audit Unit.

A concerted effort to reduce overtime in the Financial Department resulted in a low figure of 217 hours for August, as compared with 2084 hours for August, 1952, and an average of 1808 hours a month during the FY 1953. While the quarterly overtime forecast for the next three months indicates that overtime for this period will average 730 hours a month, this is well below half of the FY 1953 average.

The preparation of performance bogeys, developed with the assistance of department managers, was completed in August and a consolidated report was submitted to the General Manager.

A set of 25 charts showing production, research and development, plutonium, fabrication, and uranium recovery costs for the fiscal years 1948 through 1953, together with the actual costs for the fiscal year 1954 to date, the annual bogeys, and the latest financial plan, was prepared and is now being reproduced by the Graphics Unit. Actual figures for the remainder of the FY 1954 will be plotted on these charts in successive months.

Considerable work was done during the month in the way of assistance in the preparation of landlord reports for the FY 1953.

At the August 10 meeting of the Appropriations and Budget Committee, the requirements of each department for "Projects Less Than $100,000" were considered and allocations were made as follows:

Manufacturing	$ 800 000
Engineering	400 000
Plant Auxiliary Operations	250 000
Radiological Sciences	85 000
Medical	5 000
Estimated Work Orders (all departments except Medical)	160 000
AEC Requirement	100 000
Total	$1 800 000

General Accounting Unit personnel participated in drafting OPG 04.6 ("Capital Plant and Equipment--Accountability and Control"), issued August 17, which outlines a major revision of plant accounting procedures. The new procedure provides for the establishment of a property control unit within each department, to which the Plant Accounts group of the General Accounting Unit will furnish data as to the quantity, value, description, etc., of each unit of uninstalled equipment for which the department is responsible. This information, not previously available to the department's supervision, places management in a position to more effectively plan and control procurements and establish an orderly replacement program; prepare equipment budgets; make spare equipment available to other units; and control depreciation costs.

The general salary increase, effective June 10, 1953, was paid to all employees during the month of August. The retroactive portion of the payments, for periods prior to August, amounted to $238,397.

Statistics

A summary of cash disbursements and receipts (excluding reimbursements by the Atomic Energy Commission) for the months of August and July, 1953, is shown below:

Disbursements	August	July
Payrolls (Net)	$2 858 025	$3 094 714
Materials and Freight	1 137 434	1 303 294
Payroll Taxes	676 163	881 282
Payments to Subcontractors	472 020	631 893
United States Savings Bonds	140 948	233 126
Group Insurance Premium	127 375	126 822
Pension Plan - Employees' Portion	82 648	98 313
Other	124 905	162 998
Total	5 619 518	6 532 442
Receipts		
Rent	100 684	121 441
Hospital	68 548	70 177
Telephone	49 890	50 190
Electricity	46 586	49 102
Sundry Accounts Receivable	32 660	13 539
Bus Fares	7 406	7 606
Refunds from Vendors	3 517	1 300
Sales to AEC Cost-type Contractors	3 101	21 293
Other	3 762	3 772
Total	316 154	338 420
Net Disbursements	$5 303 364	$6 194 022

Advances as of August 31 and July 31, 1953, may be summarized as follows:

	August	July
Cash in Bank - Contract Accounts	$4 145 598	$3 448 962
Cash in Bank - Salary Accounts	50 000	50 000
Travel Advance Funds	125 000	125 000
Total	$4 320 598	$3 623 962

Personnel and Organization

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning	332	334
Additions and transfers in	15	8
Removals and transfers out	(15)	(10)
Employees at end of month	332	332
Personnel by Unit at Month-End		
General	8	9
Reimbursement Unit	4	4
General Accounting Unit		
General Accounts	19	18
Inventory Accounting	7	7
Plant Accounts	32	30
Accounts Payable	36	36
Accounts Receivable	21	22
General	3	3
	118	116
General Cost Unit		
Consolidated Costs and Budgets	5	5
Plant Auxiliary Operations	18	18
Community Operations and Real Estate	7	8
Radiological Sciences and Other	7	7
Medical	3	3
General	3	3
	43	44
Manufacturing Cost Unit		
Costs and Budgets	33	31
General	7	7
	40	38
Engineering Cost Unit		
Project Section Costs	16	16
Design Section Costs	8	8
Technical Section Costs	10	10
General	5	6
	39	40
Payroll Unit		
Preparation and Employee Records	35	34
Confidential Payroll Records	7	7
Employee Benefit Plans & Payroll Reports	21	21
IBM Procedures	1	1
General	2	2
	66	65
Internal Audit Unit	13	14
Rotational Trainees	1	2
Total	332	332

Section Reports

The monthly reports of the three sections of the Financial Department, as listed below, are shown on the following pages:

GENERAL ACCOUNTING UNIT
MONTHLY REPORT - AUGUST 1953

ACCOUNTS PAYABLE

Volume of work in Accounts Payable during August decreased as compared with July and June. There were 3,081 vouchers entered amounting to $2,575,928, and 1,973 checks written totaling $2,620,545. Number of freight bills paid was 711 amounting to $121,687. Cash discount earned during August was $3,148 compared with a monthly average of $3,982 during fiscal year 1953. New purchase orders received numbered 1,504 in August amounting to $643,763, which is a considerable decrease from the 2,021 in July amounting to $1,406,142.

On August 19, 1953 an audit of accounts payable records and procedures was started by personnel of the Internal Audit Unit. Considerable assistance has been given the five to seven auditors who have been involved in this work. The audit is expected to be completed next month.

Invoices have been received from National Carbon Company, covering shipments of graphite under Special Agreements No. G-5 and G-23, in the amounts of $2,874,249 and $430,364 respectively.

Final payment in the amount of $3,608 was made this month to Remington Rand, Incorporated under Special Agreement G-11 covering the microfilming of records. Total payments under this contract were $18,309 for microfilming 2,930,268 images.

Commitment records maintained on 31 construction projects for the purpose of determining the amount of outstanding obligations indicated an open balance of $10,049,285 at the end of August.

ACCOUNTS RECEIVABLE

The gross accounts receivable balance at August 31, 1953 was $285,233, a decrease of $13,444 from the balance at July 31, 1953. This decrease was due primarily to the payment by General Office of billings issued in prior months.

A review of the reserve for bad debts account was made this month and it was determined that the accrual to date of $30,022 would be adequate at least until January 1, 1954. No further accrual will be made until that date, at which time the balance will again be reviewed.

Out-patient invoices issued in August at Kadlec Hospital numbered 1,638 and totaled $9,246. In-patient revenue totaled $63,696. This represents an increase of approximately $4,500 due to an increase in the adult patient day census during the month.

General Accounting Unit

ACCOUNTS RECEIVABLE (CONTINUED)

Work in connection with the revision of accounts receivable records made necessary due to the increase in dwelling and commercial facilities rents continued throughout the month. This work, which will require considerable overtime, is scheduled to be completed by the middle of September.

GENERAL ACCOUNTS

The amount recorded as advances from the Atomic Energy Commission at August 31, 1953, was $4,320,598, consisting of $4,145,598 in Contract Accounts, $50,000 in Salary Accounts and $125,000 in Travel Advance Funds. Activity in the advance account during August is detailed as follows:

Amount on Hand at August 1, 1953	$3 623 962
Advances from AEC	6 000 000
Subtotal	9 623 962
Disbursements	5 303 364
Amount on Hand at August 31, 1953	$4 320 598

Advances for September have been requested in the amount of $5,000,000 to cover September disbursements and to maintain desired bank balances at the end of the month.

A Central Control Group was established in General Accounts in connection with the recently established procedure for cost distribution through IBM. This control group is responsible for the control of work processed through IBM and for the distribution to cost accounts. In addition to the above work, journalization of all payrolls was also assigned to this group.

Time was spent this month with personnel responsible for IBM procedures in discussing a proposed procedure for distribution of costs transferred from the Atomic Energy Commission. This procedure is currently being written and is to be made effective October 1, 1953. The flow of cost data will be controlled by the Central Control Group.

Considerable time was spent in analyzing financial statements and other reports issued by General Accounts to determine if additional information could be included or if changes should be made in order to improve these statements.

GENERAL ACCOUNTS (CONTINUED)

Activity in the cashier's office increased considerably during the month as a result of new homes being completed and occupied, and the corresponding increase in electricity and telephone services. Approximately 14,000 items were handled as compared to an average of 11,000 items per month for the first quarter of this calendar year.

Travel and living expense recorded in August totaled $39,074 as compared to $17,219 for the month of July. July was an unusually low month due to special efforts in June to book in fiscal year 1953 cost as much travel and living expense as possible. Number of reports processed totaled 246 in August as compared to 132 in July.

INVENTORY ACCOUNTING

Review of the inventory document control procedure, which was inaugarated in October 1952, was begun this month. This procedure is being reviewed and revised in order to incorporate operational changes which have taken place since it was adopted, and to make certain refinements and improvements. This review will require one employee's time for approximately one month.

In connection with the program now under way by the Stores Unit in analyzing the turnover of stores stock items, assistance was afforded them in screening approved stock requests on file in Stores to determine the responsible organization to be charged when certain slow moving items are declared excess.

Discussions were held during the latter part of the month with Stores Unit personnel in order to formulate procedures to be followed in adjusting inventory records currently, rather than at the time of the physical inventory for differences between book and actual. The detailed procedure covering this matter was prepared and is to be issued in September.

During the month, a schedule was prepared showing the handling charges applicable to the various inventories for which the Stores Unit is responsible. This is the first time such a schedule has been issued.

As a supplement to the new general ledger chart of accounts issued in July, schedules were prepared in August showing, by responsible organizations, the description and sub account numbers assigned for general supplies and stand-by inventories.

With the conversion of the distribution of store orders from a manual to an IBM system, it was decided that Stores would be furnished a weekly report showing the amount of store orders filled from each caption. From this report Stores Unit will be in a position to survey their activity currently and to more effectively maintain adequate stock levels.

General Accounting Unit

PLANT ACCOUNTS

Organization and Policy Guide 04.6, Capital Plant and Equipment - Accountability and Control, was issued on August 17, 1953. This policy guide outlines a major revision of plant accounting procedures initiated by Plant Accounts personnel. Revised procedures provide for the establishment of Property Control Units (to be designated by Department Managers) and furnish them with information as to the quantity, value, description, etc. of each unit of uninstalled equipment for which they are responsible. With this changed procedure and the information furnished to Property Control Units, they will be in a better position to:

1. Plan and control procurements and establish an orderly replacement program
2. Prevent accumulation of excess property
3. Prepare equipment budgets
4. Make spare equipment available to other units
5. Control depreciation costs.

An inventory, taken jointly with the Atomic Energy Commission personnel, of the Hanford Area was completed during the month. The inventory included the 101 Area (Graphite Fabrication Facilities, Fire Station, Badge House, and Boiler House), Hanford Railroad Depot, Hanford High School, and the Hanford Grade School and Heating Plant. General Electric forces have now vacated practically all these facilities and their transfer to the Atomic Energy Commission is now in progress.

Inventories of the UO_3 Plant were completed in connection with unitization of Project CG-361 - Waste Metal Conversion Facilities.

A reconciliation of Spare Equipment Temporarily Withdrawn from Stock was completed during the month. Physical inventory was taken of this equipment and few discrepancies were noted.

Work in connection with the unitization of projects continued. During the month, the following projects were unitized and distributed to classified accounts:

AEC-IA-132 - HF Line Replacement, 234-5 Building	$10 377
AEC-IA-133 - Water Quality Laboratory, 108-B Building	16 179
	$26 556

PLANT ACCOUNTS (CONTINUED)

Procedures were completed with respect to the unitization of projects concurrently as construction progresses, and for the completion of the unitization by the date the completed facility is turned over to the using department. This will be done in the case of all projects started subsequent to August 1, 1953. Unitizations of all major projects started prior to August 1, 1953 are now under way and a goal has been established for the completion of the major part of the unitization work by the time they are completed. Unitization reports of projects unitized on this current basis are subject, of course, to revision upon receipt of financial closing notices.

General Accounting Unit

	August	July
Accounts Payable		
Balance at Beginning of Month	$ 444 759	$ 602 457
Vouchers Entered	2 575 928	3 222 088
Cash Disbursements	2 620 545 DR	3 204 603 DR
Cash Receipts	3 517	1 300
Other	103	176 483 DR
Balance at End of Month	$ 403 762	$ 444 759
Number of Vouchers Entered	3 081	3 404
Number of Checks Issued	1 973	2 176
Number of Freight Bills Paid	711	862
Amount of Freight Bills Paid	$ 121 687	$ 161 870
Number of Purchase Orders Received	1 504	2 021
Value of Purchase Orders Received	$ 643 763	$1 406 142
Cash Disbursements		
Payrolls (Net)	$2 858 025	$3 094 714
Material and Freight	1 137 434	1 303 294
Payroll Taxes	676 163	881 282
Lump Sum and Unit Price Subcontracts	472 020	631 893
United States Savings Bonds	140 948	233 126
Group Insurance Premium	127 375	126 822
Pension Plan - Employees' Portion	82 648	98 313
All Other	124 905	162 998
Total	$5 619 518	$6 532 442

General Accounting Unit

	August	July
Cash Receipts		
Advances from Atomic Energy Commission	$6 000 000	$5 000 000
Rent	100 684	121 441
Hospital	68 548	70 177
Telephones	49 890	50 190
Electricity	46 586	49 102
Sundry Accounts Receivable	32 660	13 539
Bus Fares	7 406	7 606
Refunds from Vendors	3 517	1 300
Sales to Cost-type Contractors	3 101	21 293
Other	3 762	3 772
Total	$6 316 154	$5 338 420

Bank Balances at End of Month		
Chemical Bank and Trust Company - New York		
Contract Account	$ 983 053	$ 924 275
Seattle-First National Bank - Richland		
Contract Account	2 435 059	1 637 016
United States Savings Bonds Account	149 750	214 232
Salary Account No. 1	20 000	20 000
Salary Account No. 2	30 000	30 000
Travel Advance Account	74 267	79 580
National Bank of Commerce - Richland		
Contract Account	727 486	887 671
Total	$4 419 615	$3 792 774

General Accounting Unit

	August	July
Accounts Receivable		
Hospital	$ 120 710	$ 120 229
Cost-type Contractors	45 520	36 601
Sundry	39 196	65 650
Equipment Sales to Facilities	28 967	29 316
Telephones	22 062	22 545
Electricity	14 014	14 873
Rent	13 559	7 748
Safety Shoes	1 013	1 511
Loans to Employees	192	204
Subtotal	285 233	298 677
Reserve for Bad Debts	30 022 CR	30 071 CR
General Ledger Balance	$ 255 211	$ 268 606
Hospital		
Number Out-patient Invoices Issued	1 638	1 660
Charges During the Month	$ 72 943	$ 66 873
Collections - Cash	68 548	70 177
- Payroll Deductions	4 933	4 002
Cost-type Contractors		
Number Invoices Issued	24	34
Amount of Invoices Issued	$ 11 956	$ 20 712
Cash Received	3 101	21 293
Sundry		
Number Invoices Issued	253	377
Amount of Invoices Issued	$ 6 335	$ 11 725
Cash Received	32 660	13 539
Telephones		
Working Telephones (excludes official telephones)	6 052	6 077
Telephone Work Orders Processed	375	308
Charges During the Month	$ 50 420	$ 50 295
Cash Received	49 890	50 190
Electricity		
Number of Bills Issued	6 410	6 309
Amount of Bills Issued	$ 45 987	$ 46 587
Cash Received	46 586	49 102

General Accounting Unit

	August	July
Accounts Receivable		
Rent		
Houses		
Number Houses Occupied	6 041	6 029
New Leases and Lease Modifications	152	164
Lease Cancellations	128	149
Charges During the Month	$ 245 438	$ 244 182
Collections - Cash	40 774	42 892
- Payroll Deductions	203 967	204 504
Dormitories		
Number Rooms Occupied	949	1 002
New Assignments	130	130
Removals	183	133
Charges During the Month	$ 14 315	$ 15 280
Collections - Cash	3 435	3 715
- Payroll Deductions	11 805	12 259
Facilities		
Number Facility Leases	150	148
Revenue	$ 56 475	$ 74 834

	Number	Amount
Uncollectible Accounts (Total to Date)		
Accounts Forwarded to Collection Agencies	543	$ 45 383
Accounts Returned as Uncollectible	178	23 599
Collections	184 -1)	7 350 -2)
Balance at Collection Agencies August 31, 1953	209	$ 14 434

(1- Includes 156 accounts collected in full and 28 accounts partially collected.

(2- Represents total collections, half of which is remitted to General Electric.

General Accounting Unit

	August	July
Travel Advances and Expense Accounts		
Cash Advances - Beginning of Month	$ 44 403	$ 29 774
Advances During the Month	49 100	38 641
Expense Accounts Submitted	39 904 CR	17 312 CR
Cash Refunded	5 710 CR	6 700 CR
Cash Advances - End of Month	$ 47 889	$ 44 403
Outstanding Cash Advances		
Current	$ 42 017	$ 38 550
Over 30 Days	5 872	5 853
Total	$ 47 889	$ 44 403
Travel and Living Expenses		
Paid Employees	$ 39 074	$ 17 219
Billed to Government	37 695	16 202
Balance in Variation Account at End of Month	1 379 DR	1 017 DR
Inventories		
Current Inventories		
General Supplies	$ 1 124 382	$ 1 234 608
Fuel and Lubricants	93 847	89 228
Essential Materials	3 082 373	3 411 422
Total Current Inventories	4 300 602	4 735 258
Stand-by	2 695 028	2 608 723
Bulk Steel	98 143	102 863
Special Materials	283 262	282 897
Excess Materials	2 850 547	2 818 882
Total Inventories - Gross	10 227 582	10 548 623
Less: Excess Inventory Reserve	(2 858 091)	(2 788 620)
Stand-by Inventory Reserve	(759 817)	(765 085)
Total Inventory Reserve	(3 617 908)	(3 553 705)
Total Inventories - Net	$ 6 609 674	$ 6 994 918
Spare and Excess Equipment		
Recorded in Plant Accounts		
Spare Equipment Held in Storage	$ 1 494 519	$ 1 494 164
Excess Equipment	1 762 868	1 727 888
Excess Equipment Reserve	(1 757 443)	(1 733 846)

GENERAL COST UNIT
MONTHLY REPORT
AUGUST, 1953

A complete set of twenty-five cost charts were prepared for use by Management. These charts include Production, Research and Development, Plutonium, Fabrication, Uranium Recovery and Going Basis Costs from FY 1948 through FY 1953 with FY 1954 Actual, annual bogey and latest Financial Plan also reflected on each chart.

Additional procedures were prepared and arrangements made to process disbursements from standby materials account through IBM effective August 31.

Consolidated Costs and Budgets

Prepared schedules 66a and 67a "Report of Selected Data on Integrated Contractor Operations". This report shows Hanford Atomic Products Operations personnel, salaries and other statistics for FY 1953, FY 1954 and FY 1955. This report will be used at Bureau of the Budget and Congressional hearings.

Furnished AEC-HOO information on allocation of salary increases brought about by change in rates since preparation of the Budget for FY 1955.

Furnished AEC-HOO statistics on certain FY 1953 actual costs so they could complete data to be used at Bureau of the Budget hearings.

Plant Auxiliary Operations

An innovation adopted with the issuing of the July unit cost reports was the inclusion of simple graphs showing FY 1952 and FY 1953 unit costs, and providing space on a month-to-month basis for FY 1954 costs. Shown also in appropriate instances, are the performance bogeys recently submitted to plant management. More of these charts will be added in the future months.

In order to develop a closer working relationship between cost analysts of this cost unit and the unit heads they represent, analysis letters were delivered in person by the cost analyst and reviewed with the unit head. This system was received with considerable enthusiasm by the unit managers and we intend to continue doing this in future months.

Community

During the month considerable time was spent on preparation of the Landlord report. Since there were no major occupancy or utilization changes in the department's landlord responsibilities this report was issued as a supplement to the report issued a year prior. All maps, housing blueprint information, etc. were eliminated.

Medical

A considerable amount of work was done on the report to be made comparing Kadlec Hospital's operation with other hospitals of similar size visited throughout the state.

Staff

A number of items of doubtful reimbursability were cleared through the Reimbursements Unit as a result of the issue of Organization and Policy Guide 05.4. Several of the items cleared through the Reimbursements Unit are listed below:

1. Suggestion awards in excess of $100.

2. Booklets concerning benefit plans, suggestion award system, etc.

3. Advertising for recruiting purposes.

4. Training programs for off-site personnel, KAPL, Dow, DuPont, etc., and expenses incidental thereto.

5. Reimbursing the State of Washington, Department of Labor and Industries for two state employees engaged in processing G. E. claims. The State had granted a cost of living increase.

The major portion of our non-routine work effort this month was concerned with revising the Biology and Medicine Research and Development budget. The preliminary proposal for allocation of funds to Biology, Biophysics and Radiological Engineering was the result of concentrated effort at three Departmental Staff meetings. A total of 20 hours was spent in the field working with Section Managers and Unit Heads in an effort to reduce the organization budgets to conform to the reductions in Research and Development. The work is progressing favorably and will be completed early in September.

MANUFACTURING COST UNIT
AUGUST, 1953

GENERAL

The "Let's Talk It Over" program for all exempt personnel was completed during the month.

PRODUCT COST ACCOUNTING

Unit Costs on a current basis including feed material, conversion, and depreciation costs were estimated for Calendar Years 1953, 1954, and 1955.

The price of incoming uranium was substantially increased retroactive to July 1, 1953. Prices for Uranium Oxide were also increased.

The Product Cost Report was prepared on printed forms as planned.

BUDGETS

The breakdown by months of the 3rd and 4th quarters of FY 1954 was completed.

A revised procedure for preparation of budgets is being prepared and is expected to be issued during the month of September.

A control on the procurement of Capital Equipment is being set up which will give uncommitted balances of the equipment budget at anytime during the fiscal year. For the purpose of this report, all properly authorized work orders, appropriation requests and purchase requisitions are being shown as commitments.

MAINTENANCE AND PLANT IMPROVEMENT

In order to establish a uniform method of approving supplemental increases to work order estimates, a form has been designed for this purpose.

REPORTS AND RECORDS

Additional process codes were opened in the 234-5 Facility to segregate direct costs between the 2000-3000 program. Methods of allocating indirect costs for this facility were studied.

Despite a steady advancement of closing dates over the past several months, a substantial reduction of overtime hours required to complete essential material reports has been made. This is due to improved methods and closer contact with the inventory field clerks. As as example, during the months of March, April, and May, the essential material group worked 78.5 overtime hours, while during June, July, and August only 19 overtime hours were required.

In accordance with the suggestions by the Internal Audit Unit on essential material inventories, a study is being made to determine if there is a duplication of record keeping, and if so, how it can be eliminated.

REPORTS AND RECORDS (continued)

A study of personnel in the 222-S and 234-5 Facilities was made to replace the one now in use to distribute laundry costs to the proper users.

REACTOR SECTION ACCOUNTING

The monthly inventory check at the 100-B and 100-C Reactors was observed. Materials were stored in an orderly manner and the records and methods were found to be entirely adequate for accuracy and control of inventories.

Assistance was rendered the Plant Engineering Sub-Section in compiling the annual report on Landlord Properties.

Work on Standard Costs has progressed to the extent that a form for presentation of the standards was agreed upon at the monthly cost meeting. The standard cost procedures and standard costs are expected to be ready for use in September.

Field trips and contacts with area supervision were continued and assistance rendered area personnel in interpretation and control of costs.

SEPARATIONS SECTION ACCOUNTING

Unit cost explanations for July and the forecast covering the period August through January for $BiPO_4$, Redox, 234-5, TBP and UO_3 were prepared and submitted at the monthly cost meeting held August 21, 1953, in the 200-W Area.

At the request of the Superintendent of Plant Engineering, a discussion of budget considerations and budget preparation for FY 1954 and 1955 was held with the Engineering personnel of Plant Engineering.

The variance report indicating the deviation between actual cost and standard costs for all of Separations Sections expenditures for the month of July was prepared and presented in a Section cost meeting.

METAL PREPARATION SECTION ACCOUNTING

A change in method of explaining unit cost fluctuations was made this month, and will be used at the regular cost meeting in September. Rather than explain the changes between current and previous month, they will be explained between standard and actual. The variance will be broken down as to yield, changes in process inventories, and special production.

Considerable work was done in providing management with cost estimates resulting from the high G/T and low G/T program.

Standards work is progressing satisfactorily. A formal procedure for the application of standards will be issued in the near future.

ENGINEERING COST UNIT
MONTHLY REPORT - AUGUST, 1953

DESIGN COST

The net value of cost transfers to Kaiser Engineers decreased during August as compared with July due to a reduction for railroad car handling cost, fewer work orders and increased number of declarations of excess processed. Cost transfers from Kaiser Engineers include stores issues in the amount of $144 046.06 for residual construction inventories from TBP which were placed in Inventories - Stand-by.

	Number of Invoices		Total Cost Billed	
	To Kaiser	From Kaiser	To Kaiser	From Kaiser
August	40	24	$23 881.53	$253 733.78
July	38	18	64 916.53	158 148.67

Cost transfers from General Electric to Kaiser Engineers:

	August	July
Services - Telephone, Electrical, Clerical, Patrol and Fire	$53 151.68	$42 448.13
Excess Material Withdrawals	4 325.96	6 379.30
Railroad Car Handling Costs	3 815.00	9 040.00
Work Orders	2 154.69	16 640.92
Store Orders Other Than Excess	1 609.86	3 563.33
Reproduction	821.47	836.94
Major Equipment Repair		598.46
Major Construction Program Equipment - Net Book Value	218.04	9 696.67
Other	(2 011.50)	280.86
Major Equipment Overhaul and Repair - Monthly Accrual	(9 329.88)	(13 320.31)
Excess Material Declarations	(30 873.79)	(11 247.77)
	$23 881.53	$64 916.53

Cost transfers from Kaiser Engineers to General Electric:

	August	July
Stores Issues	$172 667.97	$ 22 263.84
Graphite Fabrication	46 759.95	69 410.57
Major Construction Program Equipment - Net Book Value	26 063.13	56 525.84
Work Orders	6 291.54	8 332.59
Other	1 106.36	13.98
White Bluffs Utilities	844.83	1 601.85
	$253 733.78	$158 148.67

The net value of cost transfers to Blaw-Knox increased $4 000 during August as compared with July. This is the result of increased material and equipment withdrawals and additional service billings for patrol and fire which are offset by a reduction in withdrawals from excess. Business from Blaw-Knox to General Electric is still on a relatively small scale and reflects only miscellaneous transactions.

1206603

Engineering Cost Unit

DESIGN COST (Continued)

	Number of Invoices		Total Cost Billed	
	To Blaw-Knox	From Blaw-Knox	To Blaw-Knox	From Blaw-Knox
August	24	2	$39 191.34	$1 403.56
July	26	5	35 190.40	5 719.51

Cost transfers from General Electric to Blaw-Knox:

	August	July
Major Construction Program Equipment - Net Book Value	$12 003.21	$ 8 125.82
Excess Material Withdrawals	7 756.07	5 208.21
Services - Clerical, Patrol and Fire	6 033.33	1 580.74
Utility Services - Telephone and Water	5 471.91	5 099.67
Stores Orders Other Than Excess	3 333.68	11 941.80
Reproduction	1 910.82	1 542.94
Railroad Car Handling Costs	1 470.00	600.00
Work Orders	1 144.74	1 114.25
Other	67.58	186.22
Excess Material Declarations		(209.25)
	$39 191.34	$35 190.40

Cost transfers from Blaw-Knox to General Electric:

	August	July
Stores Issues		$ 3 001.56
Major Construction Program Equipment - Net Book Value		2 717.95
Other	$ 1 403.56	
	$ 1 403.56	$ 5 719.51

Design Section monthly cost statements were issued on August 6, 1953 for the period July 1 through July 31, 1953. Sub-Section cost statements were consolidated with the summary statement to eliminate several pages of the report. The Design Section Summary Cost Statement now discloses gross and net cost figures with applicable budget amounts.

Design Section's project cost has been recast on a to-date basis as follows:

Design Scope
Detailed Design
Design Field Liaison and Design Service in the Field

This does not replace the previous presentation but serves as additional information to Design Section Management.

Engineering Cost Unit

TECHNICAL COST

July operating cost reports were issued to the managers in Technical Section and Engineering Administration Sub-Section on August 11, 1953. Research and Development detailed reports were issued on August 12, 1953. The usual monthly analysis letter to the Manager - Technology was not written for July because budget information for comparison was not available at that time. However, an anlysis letter to the Manager - Engineering Administration was prepared for the first time and will be prepared each month in the future.

A complete review of the report distribution lists was made in August in an attempt to bring these lists up to date.

The Analytical Laboratories Unit of Separations Technology Sub-Section will begin liquidating costs at standard rates per sample analyzed or per determination beginning in September. During August the details of this change were completed including the calculation of new rates. The old method of liquidating costs at rates per man-hour will be discontinued for this organization.

Discussions concerning a new method of cost accounting and inventory control for the Mechanical Development Shop were continued with many of the details for inventory control agreed upon by Purchasing and Stores Section, Technical Section, and Accounting Section personnel. Efforts to resolve the problems are continuing.

Preparation of the recast of the Budget for FY 1955 and Revision of Budget for FY 1954 was nearing completion at the end of August.

PROJECT COST

Construction Work in Progress - Engineering report for the month of July was furnished the Atomic Energy Commission on August 10, 1953. Project Section Analysis of Operating Expenses for month of July was published on August 13, 1953. All other financial statements were issued on August 10 and 11, 1953.

Recasting of the Budget for FY 1955 and Revision of Budget for FY 1954 to reflect increased personnel and organizational changes was completed early in August.

Financial Closing Statements covering the following projects were issued during the month:

CG-483 Downcomer Repairs in 100-B, D, DR and H and Replacement in 100-F
CA-497 New Substation Fencing and Grounding of Fences
CA-530 Revision of 314 Building for Canning Development
IR-133 Water Quality Laboratory - Building 108-B

Considerable time was spent in developing procedures for the placing of Project Section Time Distribution Reports on IBM. It is believed that this distribution will be performed by IBM during the month of September.

APPROPRIATIONS SECTION
MONTHLY REPORT - AUGUST, 1953

Arrangements have been made with the Commission to obtain Construction Data Sheets which were actually submitted to Congress for the Fiscal Year 1954 in support of the Plant and Equipment Budget.

At the August 10, 1953, Appropriations and Budget Committee meeting, requirements of each department for "Projects Less Than $100,000" (Budget Item 2-23X-4015) were reviewed with the Manager, or his representative, and the following allocations were established:

Manufacturing	$ 800,000
Engineering	400,000
Plant Auxiliary Operations	250,000
Radiological Sciences	85,000
Medical	5,000
Total	1,540,000
Estimated Work Orders (all departments except Medical)	160,000
AEC Requirement	100,000
Total of Budget Item No. 2-23X-4015 (Improvements, Alterations & Additions to Existing Plutonium Facilities - FY 1954)	$ 1,800,000

Since the amount approved by Congress for Equipment Not Included in Construction Projects, plus the amount carried over from Fiscal Year 1953, equals substantially the original amount requested by General Electric for the Fiscal Year 1954, it was decided at the August 10, 1953, Appropriations and Budget Committee meeting to use the allocations established in the budget submission.

Directive HW-309, dated August 6, 1953, authorized General Electric $100,000 for initiation of design for Project CG-558, Reactor Plant Modification for Increased Production. An interim scheduled date for completion of preliminary design of December 31, 1953, was established.

The following projects were approved by the Appropriations and Budget Committee in August:

CG-438, Rev. 3	Ball Third Safety System for 105-B, DR, F & H	Additional Funds $250,000 Total Project $3,900,000
CA-532, Rev. 1	Fiscal Year 1954 - Water Tank Replacements	Total Project $150,000
CG-506, Rev. 1	Repairs to the 107-B, D, F, DR & H Retention Basins	Extension of time
CA-539, Rev. 1	Additional Waste Storage for Redox	Change of scope
CA-513, Rev. 2	Expansion of 200 Area Facilities	Revised segregation of funds
CA-394, Rev. 5	Hanford Works Laboratory Area - Plot Plan & Utilities	Change of scope
CA-257, Rev. 6	Biophysics Laboratory	Revised segregation of funds

Special consideration because of the construction rider was given to Project CA-555, New 3741 Graphite Hot Shop and Storage Building. The project proposal, previously approved, will now be transmitted to AEC.

The following projects were approved by the Appropriations Sub-Committee in August:

CG-523, Rev. 2	Installation of Automatic Valves in Export Water Lines, 100-B, D & F Areas	Additional Funds $5,200 Total Project $27,800
CG-559	Process Tube Flow Facilities 189-D	Total Project $90,000
CG-560	First Cycle Supernatant Cribbing Facilities	Total Project $42,000
CA-561	713 Building Alterations	Total Project $66,400
IR-	Asbestos Shingles for Building Exteriors, 100-B, D & F	Total Project $16,700

Appropriation requests were approved by the Appropriations Sub-Committee amounting to $123,400 for equipment not included in construction projects.

PAYROLL UNIT
MONTHLY REPORT - AUGUST 1953

The general salary increase effective June 10, 1953, was paid to all employees during the month of August. The increase was paid on a current basis to weekly paid employees in salary checks distributed on August 7, 1953, and to monthly paid employees in salary checks distributed on August 31, 1953. The retroactive portion of the adjustment, amounting to $238,397, was paid to weekly paid employees on August 21, 1953, and to monthly paid employees on August 31, 1953.

Delivery of salary checks to the 100-K Area was started on Thursday, August 20, 1953. The checks are being delivered to Patrol headquarters where they are picked up by supervision of the departments involved, in accordance with the arrangements in the other outer areas. At present, representatives of Payroll are delivering weekly salary checks to nine locations beyond the perimeter barricade.

Detailed descriptions of all non-exempt jobs in Payroll were completed during August and were transmitted to Wage Rates Unit for review. Wage Rates Unit has been requested to make a detailed review and analysis to determine the proper classification and grade for each job.

During August, round table discussions were held with non-exempt employees as part of the employee communications program. These discussions received the hearty endorsement of non-exempt employees and supervisors, and will be continued in the future on a monthly basis.

Absenteeism statistics, segregated between male and female and indicating the average days lost per employee for the first six months of 1953, were prepared and forwarded to Employee and Public Relations for use in a special presentation to the Board of Directors of the Company in October.

In connection with the administration of the annuity plan for former duPont employees who transferred to General Electric Company at Hanford on September 1, 1946, statistics were compiled, in report form, indicating the number of such employees still on the payroll at July 31, 1953, and the number who have left the Company or transferred to other divisions. The statistics also indicated the average length of duPont service for these employees.

The 1953 annual payroll review of employees covered by the Professional Salary Plan was announced in August. Payroll review sheets indicating salary information for these employees were delivered to department managers.

Payroll Unit (continued)

STATISTICS

NUMBER OF EMPLOYEES	Total	Monthly Payroll	Weekly Payroll
Changes During Month			
Employees on Payroll at beginning of month	8 690	2 289	6 401
Additions and transfers in	101	9	92
Removals and transfers out	(148)	(25)	(123)
Transfers from weekly to monthly payroll		9	(9)
Transfers from monthly to weekly payroll		(4)	4
Employees on payroll at end of month	8 643	2 278	6 365

Number at month-end - by Payroll classifications	August	July
Bargaining group - HAMTC	3 444	3 467
- Building Services	69	69
- Two Platoon Firemen	44	44
- Hanford Guards	465	465
Other weekly - non-bargaining	2 387	2 400
Executive, administrative and operating	1 761	1 767
Professional	473	478
Total	8 643	8 690

Number at month-end - by departments		
Engineering	1 560	1 570
Manufacturing	3 321	3 317
Plant Auxiliary Operations	2 109	2 134
Community Operations and Real Estate	455	463
Financial	332	332
Employee & Public Relations		
Technical Personnel	103	107
Other	112	109
Radiological Sciences	362	365
Medical	243	248
General	17	16
Law	5	5
Accountability	21	21
Property Management and Control	3	3
Total	8 643	8 690

OVERTIME PAYMENTS DURING MONTH		
Weekly Paid Employees	$45 754-a)	$54 409-b)
Monthly Paid Employees	14 026-c)	26 024-d)
Total	$59 780	$80 493

NUMBER OF CHANGES IN SALARY RATES AND JOB CLASSIFICATIONS	846	1 813

(a- Includes 4 weeks ended 8-23-53.
(b- Includes 5 weeks ended 7-26-53.
- Overtime worked during period July 1 through July 31, 1953.
(d- Overtime worked during period June 1 through June 30, 1953.

yroll Unit (continued)

GROSS PAYROLL PAID DURING MONTH	August	July
Engineering	$ 824 578	$ 811 796
Manufacturing	1 644 145	1 777 732
Plant Auxiliary Operations	878 749	983 332
Community Operations & Real Estate	200 904	205 687
Other	532 409	557 873
Total	$4 080 785 -a)	$4 336 420 -b)

ANNUAL GOING RATE OF PAYROLL		
Base Plus Overriding Adjustment	$45 350 636	$43 801 226
Overtime	750 875	788 004
Isolation Pay and Area Differential	1 918 460	1 903 435
Shift Differential	548 069	548 363
Other	-	36
Total	$48 568 040	$47 041 064

AVERAGE HOURLY BASE RATES (Includes overriding adjustment)		
Bargaining group - HAMTC	$2.379	$2.274
- Building Services	1.766	1.728
- Two Platoon Firemen	2.259	2.162
- Hanford Guards	2.040	1.974
Other Weekly - non-bargaining	1.997	1.934
Executive, administrative and operating	3.349	3.207
Professional	3.612	3.485
Total	$2.515	$2.416

AVERAGE EARNINGS RATE PER HOUR	August -c)			July -c)		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	$2.135	$3.487	$2.881	$2.056	$3.350	$2.772
Manufacturing	2.624	3.536	2.802	2.518	3.392	2.690
Plant Auxiliary Operations	2.237	3.266	2.380	2.163	3.117	2.296
Community Operations & Real Estate	2.235	2.947	2.455	2.149	2.826	2.357
Other	2.039	3.007	2.454	1.979	3.552	2.377
Total	$2.360	$3.463	$2.646	$2.272	$3.325	$2.546

(a- Includes payments for four-week period ended August 23, 1953, in the case of weekly paid employees. Also includes $238 397 retroactive portion of general salary increase effective June 10, 1953 for both Weekly and Monthly paid employees.

(b- Includes payments for five-week period ended July 26, 1953, in the case of weekly paid employees.

(c- Includes shift differential and isolation pay in the case of weekly paid employees and area differential in the case of monthly paid employees. Excludes overtime premiums, commissions, suggestion awards, etc.

Note - General salary increase effective 6-10-53 is reflected in the August statistics.

yroll Unit (continued)

EMPLOYEE BENEFIT PLANS Participation in Benefit Plans at Month End	Number Eligible August	Number Participation August	Percent Participation August	Percent Participation July
	8 004	7 706	96.3%	95.3%
Pension Plan				
Insurance Plan	8 637	8 540	98.9	98.9
Personal Coverage	-	5 790	-	-
Dependent Coverage				
U. S. Savings Bonds	8 038	3 880	44.8	44.5
Stock Bonus Plan	8 038	997	11.5	11.3
Savings Plan	8 038	4 434	51.2	50.8

Pension Plan	August	Total to Date
Number Retired	1	280-a)
Aggregate Annual Pensions Including Supplemental Payments	$294 733	$84 778-b) 85 202
Amount contributed by employees retired		

(a- Includes 15 employees who died after reaching optional retirement age but before actual retirement. Lump sum settlements of death benefits were paid to beneficiaries in these cases.

(b- Amount before commutation of pensions in those cases of employees who received lump sum settlement.

	August	July
Number who became eligible for participation	98	78
Number who applied for participation	90	73
Number who elected not to participate	8	3
Replies not received	-	2

	August	Year to Date
Normal Retirement Pension Applications	-	13
Optional Retirement Pension Applications	1	10

Insurance Plan Claims - Death Benefits -c-	August	Total to Date
Number	4	128
Amount	$28 000	$791 013

Claim Payments - Accident & Health Insurance	August	July
Number of Checks	1 522	1 619
Number of Claims	892	993
Amount of Benefits	$ 77 104	$ 84 736
Total benefits paid since December 1, 1950 to date	$2 130 183	$2 052 779

(c- Total to date includes all claims under the old and new Insurance Plans and 10 deaths on which accidental death benefits were paid.

U. S. Savings Bonds Annual Going Rate of Deductions	August	July
G. E. Employees Savings and Stock Bonus Plan	$1 723 113	$1 719 641
G. E. Savings Plan	506 049	502 721
Total	$2 229 162	$2 222 362

Payroll Unit (continued)

Employees Who Have Entered Military Service

	Total to Date				
	Called to Duty	Volunteered for Duty	Number Reactivated	Number Resigned (a)	Net
Reserve Officers	41	6	(5)	(1)	40
Enlisted Reserve	56	6	(23)	(2)	37
National Guard	6	-	(4)	-	2
Selective Service	82	-	(29)	(1)	52
Voluntary Enlistments	-	119	(4)	(5)	110
Total	185	131	(66)	(9)	241

(a- Employees who were removed from the roll to enter Military Service and subsequently had their continuous service broken.

Annuity Certificates (for duPont Service)	August	Total to Date
Number Issued	-	96

Suggestion Awards		
Number of awards	49	2 249
Total amount of awards	$930	$45 815

Patent Award Payments	August	Year to Date
Number of award	-	3
Amount	-	$75.00

PREFERENTIAL RATES	August	July
Number- Eliminated (Net)	8	13
Number Currently in Effect	669	677

Military Allowance Payments	August	Total to Date
Number	1	65
Amount	$381.12	$23 557.58

INTERNAL AUDIT UNIT
MONTHLY REPORT
AUGUST, 1953

A summary report of the results of the physical inventories of all Hanford Atomic Products Operation inventory material (excluding source and fissionable materials) was issued in August. The report showed that the physical inventory value exceeded the book value by $2,025,997, $1,786,273 of which was applicable to excess materials and represented principally a write-up to acquisition values of materials and equipment previously booked at percentages of acquisition values.

The financial records of the Richland Community Council Fund were audited as of August 5, 1953 in accordance with an agreement between the Richland Community Council and General Electric Company providing for an annual audit. A report of findings and recommendations was issued to the president of the Richland Community Council.

A report of the cash fund audit made as of July 21, 1953 (see monthly report for July) was submitted to the Manager-Finance. In addition, letters reporting the findings relative to specific section funds were sent to the respective managers.

Unrecorded materials, found in the July survey, (see monthly report for July) which appeared to be in excess of normal shop stocks were called to the attention of section managers who were requested to give information relative to the disposition of the materials in the custody of their employees.

Several auditors began an audit of the operations of the Accounts Payable group, in the General Accounting Unit, on August 19, 1953.

PLANT PROTECTION SECTION

MONTHLY REPORT - AUGUST 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	62	61		1 (a)
Security and Patrol	521	516		5 (b)
Safety and Fire Protection	154	154 (c)		
Office Unit (Laundry and Building Services, Clerical, and Records Control)	324	316		8 (d)
TOTALS	1,063	1,049		14

NET DECREASE: 14

(a) - Administration Area Maintenance

1 - Transferred in
1 - Transferred out
1 - Termination

(b) - Security and Patrol

2 - New Hires
1 - Reactivated
2 - Transferred out
3 - Deactivated
3 - Terminations

(c) - Safety and Fire Protection

1 - New Hire
1 - Transferred in
2 - Terminations

(d) - Laundry and Building Services

1 - Reactivated
3 - Deactivated
1 - Transferred out
2 - Terminations

Clerical Services

11 - New Hires
1 - Reactivated
1 - Transferred in
11 - Transferred out
5 - Terminations

SAFETY AND FIRE PROTECTION UNIT

Injury Statistics

	JULY	AUGUST	YEAR TO DATE	COMPARATIVE PERIOD, 1952
Major Injuries	1	2	10	12
Sub major injuries	1	1	10	17
Minor Injuries	350	363	2,788	3,038
Exposure Hours	1,469,000	1,458,977	11,614,054	11,767,736
Major Injury F/R	0.68	1.37	0.86	0.93
Major Injury S/R	0.002	0.02	0.033	0.06
Penalty Days	0	0	75	375
Actual Days Lost	3	33	387	374
Minor Injury F/R	2.38	2.49	2.40	2.56
Estimated Medical Treatment Time Required	1,432 hours	1,460 hours	11,256 hours	12,288 hours

Industrial Fires

Department	Area	No. of Fires	Cause	Loss
Manufacturing Department				
Reactor - Mechanical	100-F	1	Electric	Nil
Metal Prep - Operations	300	1	Process	Nil
Plant Auxiliary Operations				
Elect. Dist. & Tel.	Outer	1	Lightning	Nil
Plant Protection	200-W	1	Electric	Nil
No department charged	Outer	2	Lightning	Nil
	Outer	1	Smoking or matches	Nil
TOTAL		7		Nil

Safety Activities

There were two major and one sub-major injuries during this period, as well as two near-serious accidents.

The minor injury experience showed 363 minors against 350 for July. This shows no improvement over the preceding months.

Some activity was observed by Area Management to improve housekeeping in the 100 and 200 Areas.

The Separation "Safety Stampede" is scheduled to get under way on Tuesday, September 1, in the 200-East and 200-West Areas.

The activities of sub-contractors and minor construction forces are still requiring considerable effort on the part of our Safety Engineer in eliminating unsafe conditions effecting GE personnel.

Constructive interest by various supervisors of sections in the industrial areas is being shown in the Area Injury Reduction Contest which was won by the 300 Area in July.

Fire Prevention Activities

Seven fires occurred during the month, but all were extinguished before any material damage was done.

Fire protection surveys were completed on Buildings 1719-F and 327.

A study is being made of the use and storage of acetone in and around 105-DR Building.

High value spare parts are now being moved from the old wooden construction warehouse in 100-B Area to the non-combustible warehouse in 100-H Area.

New fire hydrants around the 2101-E Building were inspected and tested. All sub-standard conditions were corrected.

Blaw-Knox has taken over 272-E Building and First Aid Fire Appliance has been assigned to them until they can bring in their own.

The 200-West Area Program Committee meeting was attended and plans for Fire Prevention Month were discussed.

The new 328 Building has been accepted from construction. Some trouble is being experienced with the fire alarm system in the building.

Fire procedures for all 300 Area buildings are being revised.

There are many cylinders of compressed gas in the 300 Area that have been partially used and that there is no further use for. The recommendation that the cylinders be emptied is being followed.

Plans for fire prevention week are being formulated.

OFFICE UNIT

200-West Laundry	July	August
Pounds Delivered	183,622	181,342
Pounds Rewashed	6,040	5,540
Total Dry Weight	189,662	186,882
Monitoring Section		
Poppy Check - Pieces	177,749	195,669
Scaler Check - Pieces	225,205	239,621
Total Pieces	402,954	435,290
Rewash Pieces	5,967	5,773

700 Area Laundry	July	August
Flatwork - Pounds	42,615	37,397
Rough Dry - Pounds	28,854	31,770
Finished - Pounds	2,383	2,252
Total Weight	73,852	71,419
Estimated Pieces	96,746	93,558

Clerical Services

Discussions with exempt supervisors are being held during August and rating sheets for non-exempt employees were distributed to all Clerical Services supervisors for processing.

Central Mail and Addressograph

A slight decrease was noted in the postal and regular mail during August, but an increase of registered and special delivery mail was recorded.

Interoffice mail increased for Central Mail, partially due to the consolidation of 760 mail room with Central Mail, which resulted in the elimination of two mail messengers.

Four new Ford panel delivery vehicles were assigned to Central Mail on August 4, and the four lowest mileage vehicles were reassigned to Area Mail, along with four new vehicles, thus eliminating equipment, i.e. pickup trucks, etc. not suitable for clean, safe delivery of mail. Two high mileage vehicles were retained in Central Mail to round out the required number of six to be rotated on outer area delivery and 700-1100 Area.

Addressograph work increased slightly reflecting the files recently added and their usage, plus several special mailing assignments.

A review of the "Exempt List Files" is being conducted by several of the departments resulting in numerous corrections and changes.

Types and Pieces of Mail Handled	August	July
Internal	1,801,928	1,670,566
Postal	79,853	86,107
Special	2,324	1,980
Total Mail Handled	1,884,105	1,758,653
Total Postage Used	$3,124.58	$3,618.00
Total Teletypes Handled	3,843	3,738
Total Store Orders Handled	587	418

Addressograph	August		July	
Type of List	Number of Runs	Total Copies	Number of Runs	Total Copies
Plant Name List	97	137,568	104	172,536
Housing List	15	66,320	20	78,210
Payroll List	11	32,651	12	54,308
Total New Plates		3,825		2,321
Total Corrected Plates		1,672		1,182
		5,497		3,503

Office Equipment - Furniture

The delivery of office furniture for Project C-406, Mechanical Development Building, has been further delayed and no issues were made during the month. The next tentative scheduled date is set for September 2, 1953.

The following is a list of items and quantities of furniture handled during the month. There was a slight decrease in number of pieces handled over the previous month.

Item	Received by Credit S.O.	Issued	Salvaged
Bookcases	0	4	0
Cabinets	27	141	7
Card File	5	77	21
Chairs	90	136	9
Costumers	57	124	2
Desks	33	64	2
Tables	17	49	0
Miscellaneous	1	6	0
	230	601	41

Desks and tables received on FY 1953 budgets for replacements are being exchanged on an organizational level as rapidly as orders can be processed. Used furniture received in exchange is being used to fill construction requirements.

A schedule for routine maintenance of chair casters, desk drawers, filing cases, etc., is being prepared to periodically check office furniture in service. This program will result in less emergency service calls and prolong life of furniture.

A routine work order has been issued to Manufacturing Department to cover maintenance of office furniture. Area Maintenance shops will not perform any work against this work order until a service order request is issued and approved by Office Unit supervision. This method of repairing furniture in outer areas will reduce excessive handling costs and it will channel all cost of repairing furniture into one cost code.

Office Machine Repair

A total of 95 office machines were excessed during the month, 53 serviceable machines were being transferred off plant to fill other A.E.C. installation requirements and 42 machines were excessed due to retirement based on existing policy.

Office machine repair load has been rather steady in all areas with the exception of the 200-E Area, in this area we have had a noticeable increase in the past month. This increase is due to Blaw-Knox having moved their complete operation to the 200-E Area.

The Instrument group has completed its move from the 722-D Building to the 722-C Building.

Individual office machine folders are being set up by HW numbers. These folders will be used to file service orders, transfers, and any other information concerning each individual machine.

Central Printing

Orders received this month showed a 25% increase over last month. This work involved a mixed lot of orders including short press runs and long runs requiring a great deal of composing, camera and plate making work. These larger orders included three 1,000 pad orders for "Don't Say It - Write It", one 200 page National Salary Survey Report and one West Coast Salary Survey Report. Another 38,000 copies of Foreman's report cards for Kaiser Engineers, also 120,000 copies of safety letterhead paper.

Two accomplishments worthy of mention were worked out and put into operation during the month. Each effects a saving in time and money.

1. A change was recommended in the forms used by the Manufacturing Cost Unit, for the preparation of the Plant Production Cost Report. A study made it possible to reduce the eleven forms presently used, to four master work sheets, thus providing a more flexible method of preparing a complete Production Cost Report. It is estimated that an average of seven working days can be saved out of each month by the adoption of the proposed method. Dollar wise the savings will approximate $1,200.00 annually.

2. By revising the General Electric purchase order master, form number V-1.22-M, it was possible to eliminate the preprinting and gathering of the purchase order form sets, resulting in a substantial saving in time and money. Estimated dollar saving by cutting out preprinting of form sets and gathering labor is $209.18 monthly or $2,510.16 annually.

Work Completed	August	July
Orders received	487	315
Orders completed	448	303
Back Log	82	75
Copies printed	2,006,905	1,487,462
Negatives masked	1,108	931
Negatives processed	1,387	1,009
Photo copy prepared	264	254
Litho plates processed	1,214	977

Stenographic Services

Ten new employees were assigned to Stenographic Services during the month; seven classified as Stenographer-Typists and three as Stenographers. Ten transfers were effected and three employees terminated to enter college.

Thirty-seven requests for temporary loan assignments were filled, however, it was impossible again this month to fill all requests made for vacation and sick relief.

Average employment in Stenographic Services was 18.5 as compared to 22 in July with productive time showing a reduction of only 121 hours. Non-productive time was reduced by 404 hours.

Work was largely routine throughout the month, however, there were a number of rush assignments requiring quite a number of hours work - two for Pile Technology, 36 and 42 hours each; one for Design Engineering, 56 hours; Procedure Manual for Radiation Monitoring, 73 hours.

Breakdown of Hours	August	July
Dictation and Transcription	8	0
Machine Transcription	36.5	19
Letters	32.5	17
Rough Drafts	56	63.5
Dittos, duplimats, xerography	300.5	199.5
Miscellaneous	299	437.5
Training Time	365.5	792.5
Meeting Time	4	31
Unassigned time (Sign-up)	56	84
Vacation Time	80	0
Total	1,238	1,644
Employees loaned to other departments	2,203.5	2,320
Total Hours Available	3,441.5	3,964

Area Mail and Duplicating

Area Mail service was extended this month to provide daily deliveries to Grove Shepard, Wilson and Kruge, Inc. offices in 200-W Area. Five new mail stops were also added in 100-B Area.

Eight panel delivery vehicles were assigned to Area Mail in replacement of pickup trucks. Four of these vehicles were new. This exchange will greatly assist Area Mail personnel in providing prompt, all-weather mail service.

Discussions held with Metal Preparation Section resulted in an arrangement permitting mail vehicles in 300 Area to enter the 303 exclusion area to make deliveries. This mail in the past has been delivered by messengers required to leave the mail vehicle outside the subject exclusion area and make deliveries on foot. The new arrangement will accelerate mail service and make handling of heavy mail loads more efficient.

The new Verifax process installed in 703 Duplicating is now being utilized for reproduction of suggestions. This job has formerly been accomplished by a two step process which was more costly. The Payroll Unit, Purchasing and Stores, and A. E. C. personnel are also making wide use of this process.

A new method of exposing sensitized aluminum plates was used on an issue of the Management News Bulletin this month. The new system eliminates the necessity of making a negative, and provides near-printing quality at duplicating costs.

Duplicating and Mail Statistics	August	July
Orders received	3,864	3,038
Orders completed	3,752	2,970
Orders on hand	105	68
Offset plates	19,562	14,533
Offset copies	1,108,999	794,778
Stencils	572	898
Stencil copies	12,400	18,138
Ditto masters	1,043	699
Ditto copies	32,050	23,306
Xerox plates	1,248	1,067
Verifax Masters	1,132	5
Verifax copies	2,788	30
Total Internal Mail	730,533	677,629

Records Control

Quantity of records received, processed and stored:

Employee & Public Relations Department	11	Standard	Storage	Cartons
Engineering Department	11	"	"	"
Financial Department	81	"	"	"
Hanford Atomic Products Operation Management	7	"	"	"
Manufacturing Department	12	"	"	"
Medical Department	36	"	"	"
Plant Auxiliary Operations Department	98	"	"	"
Radiological Sciences Department	507	"	"	"
	763	Standard	Storage	Cartons

Persons provided records service:	746
Records Cartons issued:	363

Percentage of Records Service Center Vault occupied by records is 82.9%. (Includes space formerly occupied by Civil Defense)

Twenty-seven requests for file cabinets were received. Fifteen requests were filled. Two requests were cancelled. Thirty-one requests for file cabinets are pending. Five fire proof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a savings of $750.00. ($225.00 cost of combination cabinet minus $75.00 cost of key locked cabinet equals $150.00 savings per cabinet exchanged.) One combination locked cabinet picked up with no exchange.

Uniform filing was established in nine offices during the month. A total of 441 offices have installed the uniform filing system to date. Eleven rechecks were made on established files.

Seven evaluations of records for disposal were developed to be submitted for internal departmental approval.

Movement of Civil Defense from the Records Service Center was completed in this month. One hundred and fifty sections of shelving was installed in space formerly occupied by Civil Defense, representing storage space for 9,000 cartons of records.

The custody of the A & J Company records storage building was turned over to General Electric on August 28, 1953.

A letter was addressed to the Atomic Energy Commission requesting the Comptroller General's approval to dispose of certain records created in the period during which the Independent Offices Appropriation Act was applicable.

ADMINISTRATION AREA MAINTENANCE UNIT

CA-504 Lighting Improvements - 700 Area Buildings: Tie-ins made to 760 Building. Contractor has received panels and fixtures, and installation work has started.

-- New Administration Building: AEC has forwarded to Washington office photographs showing crowded office conditions. They indicate that the Bureau of the Budget is still withholding funds.

CA-525 Conversion of Basement, 5th Wing, 703 Building to Civil Defense Auxiliary Center: Work progressing. Water tie-in complete. Sewer, steam and condensate tie-ins scheduled for early September.

AEC-114 New Transportation Facilities: Construction work progressing on Phase I. Bids to be opened on Phase II September 4. AEC has issued invitations to bid on equipment, and a portion of equipment has been purchased.

-- Alterations to 713 Building: Project proposal approved by A & B Committee August 31.

AEC-111 Central Stores Warehouse: Latest available information from AEC Monthly Progress Report shows September 15, 1953 as the scheduled date for final completion of fourth bay.

IR-147 Partitioning, 761 and 762 Buildings: Installation of partitions completed. Work on rearrangement of radiators in progress. This job is running considerably ahead of schedule.

CA-434 Bio-Assay Laboratory: Construction work in progress. Phase I, covering building shell and installation of fixtures, scheduled for completion on November 18, 1953.

Annual report on Landlord Properties was completed.

Telephone and Radio Maintenance personnel and equipment are in process of being moved to 744 Building.

Shaded sides of 700 Area buildings were washed down and sprayed in an effort to control accumulation of spider webs.

Exterior of 701-A Building was covered with shakes to prevent building deterioration.

Turf was removed from lawn areas immediately adjacent to 700 Area building frontages and space filled with gravel to improve drainage and prevent damage to building walls by mowing equipment.

Fire alarm systems were inspected in 700 Area buildings and Kadlec Hospital.

An electric hot water tank was installed in 702 Building, to replace steam generated tank.

Several older industrial type light fixtures in 703 Building were replaced with Smithcraft fixtures for better lighting and to accommodate installation and rearrangement of office partitions.

Broken and missing shakes on 700 Area Buildings were replaced.

Heating systems of 700 Area buildings are being checked and minor repairs made, in preparation for the heating season. Several radiators are being added in 761 and 762 Buildings and some exchanges are being made to provide more equalized heating.

Work has been started on remodeling of semi-trailer formerly used in connection with the Safety Shoe Program, for use as a Civil Defense Mobile Control Center.

The second "Farr-Air" desert cooler attachment was installed on a cooler in the 4th Wing of 703 Building. Earlier in the season one was installed on the west end of 713 Building. Results to date have been satisfactory.

Special machine work was done on a stainless steel tank for 300 Area.

Exit lights on 700 Area buildings were rewired.

A division box was installed at 784-A to drain all waste water from the softener operation to the storm sewer rather than to the sanitory sewer line.

A steam flow meter was installed at 784 Heating Plant to record all steam used in heating plant auxiliaries. This useage was formerly calculated on the basis of estimates.

Inspection of the smoke stack at 784 Building revealed a vertical cracking condition which required banding. Bands were fabricated in our shops and were installed by Custodius Construction Company. Lighting cable ground wires on the stack are to be completely replaced, with sufficient wire provided so that we may continue the cables underground and attach to buried grounding elements.

The No. 2 Steam Turbine and boiler feed pump were overhauled and several conveyor links replaced.

No. 2 boiler was in service throughout the month, with No. 3 in reserve. No. 1 is being overhauled and a few minor repairs are being made to No. 4.

During the period of hookup of the steam flow meter for auxiliary equipment, the boilers were operated at 50 pounds pressure instead of the normal 110 pounds. The clear well pumps at 784-A softener plant were used to supply 70 pounds softened water direct to the boilers. This was made possible by use of a bypass line, recently installed, which permits clearwell pumps to function as boiler feed pumps.

The quantity of steam generated at the 784 Heating Plant was 6.2% less than in August, 1952.

Rail coal shipments were resumed on August 25, after having been discontinued on July 3. During this period coal was used from the stock pile.

Coal Consumed:	468.55 net tons
Steam generated	7,028.4 M. lbs.
Steam leaving plant	5,974.1 M. lbs.
Steam delivered	4,450.1 M. lbs.
Total water softened	1, 219,600 gallons
Total soft water sent to Kadlec Hospital	259,370 gallons
Total soft water sent to 784 Heating Plant	960,230 gallons
Soft water served to Kadlec Hospital	744 hours.

SECURITY AND PATROL UNIT

Document Report

Number of classified documents unaccounted for as of August 1: 368
(153 of the above 368 documents are chargeable to E. I. du Pont de Nemours and Co.)

Number of classified documents reported as unaccounted for during August: 51

Number of classified documents recovered during the month of August: 6

Number of classified documents remaining unaccounted for as of September 1: 413
(153 of the above 413 documents are chargeable to E. I. du Pont
de Nemours & Co.)

Security Education

Seven items concerning security appeared in the Works NEWS during the month.

There were 289 security meetings held and attended by 4,010 employees of the General Electric Company. A representative of the Security and Patrol Unit showed one of the security films at some of these meetings as indicated below:

"The Tallest Shadow" was shown at one meeting with twelve in attendance.

"Signal 99" was shown at five meetings, each with an average attendance of 21 employees, or a total attendance of 105 people.

"The Defense Rests" was shown at one meeting with thirty people present.

"Only the River" was shown at one meeting with twenty employees in attendance.

"The Man on the Left" was shown at three meetings each with an average attendance of sixteen employees, or a total attendance of 48 people.

"The Case of the Smokeless Chimney" was shown at one meeting with 85 people present.

"Sabotage" was shown at three meetings, each with an average attendance of 34 employees, or a total attendance of 102 people.

"Fitting 'U' Into Security" was shown at two meetings, each with an average attendance of 27 people, or a total attendance of 54 employees.

"On Guard" was shown at one meeting with fifteen people present.

GE Security Bulletin No. 78 entitled "Communism in Industry" was distributed to all Operations personnel on August 25.

Two thousand copies of the "A-B-C" security pamphlet with the slogan "No - No-No - There's a Better Way" were distributed to all operations personnel during the month of August.

One thousand copies of the pamphlet furnished by the Munitions Board, Washington, D.C., were distributed during the month of August. The pamphlet carried the slogan "Disaster Follows Sabotage".

The following security posters were posted on bulletin boards throughout the plant:

450 copies of the large size with the slogan "Identify Visitors - Prevent Sabotage", 200 copies of the bus size poster with the same slogan were posted in the plant busses.

100 copies of the poster furnished by the Munitions Board with the slogan "Disaster Follows Sabotage" were posted in the plant areas.

All personnel was advised by the Security Unit of changes made in the "Q" and Formal "P" photo identification passes issued after August 10, 1953. Passes issued after that date will be identified by a green border signifying that the individual has a "Q" clearance and the Formal "P" clearance will be indicated by a red border around the photograph. Passes in both categories issued prior to August 10, 1953 will be valid until replacement passes are issued.

On August 11, operations management personnel was advised that the status of the 2101 Building, 200-E Area, was changed from a security "limited" area to "exclusion" area classification.

Procedures were established August 28 whereby either the Security Office or the Employment Office will obtain the photo passes of all employees who are deactivated from the rolls. The pass will be reissued by the Security Office at the time the employee is reinstated on the payroll.

The Employment and Technical Personnel Offices and off site subcontractors were advised August 31 of the need to stamp all Personnel Security Questionnaire forms with a statement that the listing of organizations designated as totalitarian, fascist, communistic, subversive, etc. has been redesignated by the United States Attorney General as of April 29, 1953.

A security education program was established for Minor Construction and the J. A. Jones subcontractor personnel with the following provisions:

Meetings have been scheduled whereby all personnel with "Q" security clearance will be given the security "Q" orientation talk by representatives of the General Electric Security Office. To date 78 employees have received their orientation.

All new employees will attend scheduled General Electric "Q" security orientation lectures in the various areas upon receipt of their "Q" security clearance in the future.

Security meetings will be held once each month. Films, speakers, etc., will be provided by the General Electric Security Office.

Security Bulletins, posters, etc., are now being forwarded to this group by the General Electric Company Security Office and are being distributed and posted through the field.

Eight cases were submitted to the Atomic Energy Commission for processing for emergency "Q" security clearance.

Ninety-three employees of the General Electric Company received a "Q" security orientation talk from either a representative of Security or a Security Patrol Supervisor during the month of August.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-E,W	300
Pat Searches	56	84	79	78	0	356	1
Escorts	18	7	21	25	5	56	38
Ambulance Runs	0	4	2	2	0	5	4
Passes Issued:							
One day temporary	86	11	6	4	3	37	30
Travel	6	0	34	0	0	0	64
Red Tag	258	86	19	25	0	509	93
Telephonic	7	2	17	3	6	0	5
Supervisor's Post Contacts	526	379	315	221	60	962	680
Other Security Patrol Activities (Computed by Hours)							300 & 700
Security File Check	133.5	299	345.2	327	292	370	1,288
Building Check	236.5	80	.5	0	292	323	392

Other Security Patrol Activities:

Buildings and doors opened:	253
Railroad Gates Opened:	208
Master System Keys issued:	60
Operation Gas Pumps:	176

Arrest Report

Violation	Number of Violations	Cont. Cases from July	Cases Cleared	Pending	Fined
Speeding	2	0	1	1	1
Public Intoxication	1	0	1	0	1
Passing in a "No Passing" Zone	1	0	0	1	0
	4	0	2	2	2

Citation Tickets issued: 4

Security Patrol Training Activities

157 Security Patrolmen received classroom instruction during the month of August.

188 Security Patrolmen attended Firearms Training during the month.

Safety Class	1 1/4 hours
Security Class and Operations Class	3/4 hour
Firing of .38 cal. revolver	1/2 hour

Security Patrol Post Changes

Effective August 7, the North Reception Desk, 101 Building, 3000 Area, manned only on the day shift, was discontinued. This post is under the direction of the 300 Area.

On August 11, three posts, each manned twenty-four hours by one man, were discontinued in the 100-H Area as follows:

Area Building roving patrol.
White Bluffs Patrol vehicle.
181 Building Tower

On August 10, six temporary posts located at 100-K Area and under supervision of 100-B Area were discontinued by 100-B Area Security Patrol. On August 11, these same six posts were designated as permanent posts in the new Security area established on this same date - 100K Area. This area has a patrol headquarters with the following six posts:

Badge House
Vehicle Gate
Security Rover
Key Detail Rover
Motor Patrol
Radio Operator

Field Inspection Activities

One search was conducted to locate unaccounted for documents.
One document was located as the result of this search.

General

Section 15.9 of the Organization and Policy Guide pertaining to instructions for the "Destruction of Classified Scrap" was distributed August 21.

1,104 photo identification passes were laminated and issued.

492 "A" type badges were assembled and distributed to the proper areas.

309 "A" badges were received from the areas.

59 "visitor", "Construction" and "A" badges were received from the areas for repair.

Daily badge log entries on telephone log - 2,230 additions and 246 withdrawals.

"Q" clearances issued:	108
Formal "P" clearances issued:	56
"P" approvals issued:	36

In connection with the rephotographing project, the following numbers of badges have been processed for the year to date:

"A" type badges:	640
"B" badges:	2,870
Photos for passes	581
Total	4,091

DECL[redacted]SIFIED

HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING AUGUST 31, 1953

1200030

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - TECHNOLOGY SECTION							
I. Visitors to this Works							
E. E. Baldwin Knolls Atomic Power Laboratory Schenectady, New York	Consultation on boron carbide engineering irradiation KAPL 114	J. A. Berberet	8-3-53	8-7-53	X		100-B 105-B, 105-C 100-D XXX 100-F XXX 100-H 105 300 XXX; 700
C. E. Bussert National Lead Company Fernald, Ohio	Discuss beta heat treating results	R. W. Benoliel	8-6-53	8-7-53	X		100-B 105-B, 105-C 300 303
R. J. Carr Radiation Laboratory Berkeley, California	Discuss Berkeley sample processing and forming chemical separations	E. M. Kinderman	8-10-53	9-5-53	X		200-W Redox, 222-T 300 XXX
A. L. Dighton Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on radiographic and autoradiographic procedures	A. E. Smith	8-10-53	8-13-53	X		200-W 234, 235
K. H. Gayer Wayne University Detroit, Michigan	Mass spectometry work	G. J. Alkire	8-27-53	9-2-53	X		100-B 108-B 300 XXX
C. Goetjen Air Reduction Pacific Co. Seattle, Washington	Discuss welding shop floor plans	W. R. Smith	8-19-53	8-20-53		X	200-W XXX 300 XXX
V. C. Hamister National Carbon Company Cleveland, Ohio	~~Inspect shipments of~~ National Carbon graphites received on site and discuss machining of these bars	L. P. Bupp	8-25-53 8-28-53	8-28-53 8-30-53	X		100-D 105, 189 200-E 2101 300 303 700

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
E. K. Hulet Radiation Laboratory Berkeley, California	Discuss Berkeley sample processing and forming chemical separations	E. M. Kinderman	8-10-53	9-5-53	X	200-W Redox, 222-T 300 XXX
T. G. Lake National Lead Company Fernald, Ohio	Discuss beta heat treating results	R. W. Benoliel	8-6-53	8-14-53	X	100-B 105-B, 105-C 300 303
R. L. Mansfield National Carbon Company Cleveland, Ohio	Inspect shipments of National Carbon graphites received on site and discuss machining of these bars	L. P. Bupp	8-25-53	8-28-53	X	100-D 105 200-E 2101 300 303; 700
P. R. Powell Los Alamos Scientific Lab. Los Alamos, New Mexico	Continue work on neutrino program	J. A. Berberet	7-28-53	8-10-53	X	100-B 105-B, 105-C 100-H XXX 300 XXX; 700
C. L. Schuske Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Discuss critically safe vessel design and nuclear safety	W. J. Ozeroff O. F. Hill	8-3-53	8-4-53	X	100-D 105, 189 200-W 231, 234, 235 300 XXX
F. P. Seymour General Electric Company Schenectady, New York	Development and process information	O. H. Greager	8-3-53	8-6-53	X	700
T. Trocki Knolls Atomic Power Lab. Schenectady, New York	Discuss mutual problems on water cooled reactor technology and new pile design	M. Altman W. K. Woods	8-5-53	8-6-53	X	100-D 189, 105 100-H 105 300 XXX; 700
M. P. Warren Los Alamos Scientific Lab. Los Alamos, New Mexico	Continue work on neutrino program	J. A. Berberet	7-28-53	8-10-53	X	100-B 105-B, 105-C 100-H XXX 300 XXX; 700
G. W. Watt University of Texas Austin, Texas	Technical consultation on separations problems	O. H. Greager	8-10-53	8-14-53	X	100-D 105 200-W 221-T, 231, 234, 235, Redox, 221-U 300-L XXX

Ja-18

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass. Areas
B. Weidenbaum Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on specifications, operations and nuclear safety on 234-5 process	V. R. Cooper O. F. Hill	8-2-53	8-8-53	X	200-W 231, 234, 235 300 XXX
F. A. White Knolls Atomic Power Laboratory Schenectady, New York	Consultation on crystal spectrometer beam experiment, fuel irradiation, and mass spectrometry and joint KAPL-Hanford experimental work	G. J. Alkire J. E. Faulkner	8-18-53	8-21-53	X	100-B 108 100-D 105 100-F 105 100-H 105 200-W Redox 300 XXX
II. Visits to other Installations						
M. Altman to: Argonne National Lab. Chicago, Illinois	Consultation on heat transfer	A. Jameson	8-31-53	9-2-53	X	
M. Altman to: Aircraft Nuclear Propulsion Project (personnel) Arco, Idaho	Consultation on heat	H. Lichtenberger	9-3-53	9-4-53	X	
R. L. Andelin to: Knolls Atomic Power Lab. Schenectady, New York	Discuss electroplating	C. E. Lacy	8-3-53	8-14-53	X	
J. A. Ayres to: Argonne National Lab. Chicago, Illinois	Consultation on coating and corrosion problems	F. G. Foote	8-3-53	8-3-53	X	
J. A. Ayres to: Battelle Memorial Inst. Columbus, Ohio	Consultation on coating and corrosion problems	H. R. Nelson	8-4-53	8-5-53	X	
J. A. Ayres to: Iowa State College Ames Laboratory Ames, Iowa	Consultation on coating and corrosion problems	F. H. Spedding	8-6-53	8-7-53	X	

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
V. R. Cooper to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Discuss operating and process experience for redesign work on Tasks I, II, and III at HAPO and review core specifications	I. B. Venable B. Weidenbaum E. J. Walko	8-13-53	8-14-53	X		
E. A. Eschbach to: Battelle Memorial Inst. Columbus, Ohio	Consultation on fuel element development	H. R. Nelson	8-4-53	8-5-53	X		
E. A. Eschbach to: Iowa State College Ames Laboratory Ames, Iowa	Consultation on fuel element development	H. A. Wilhelm	8-6-53	8-7-53	X		
P. F. Gast to: California Research & Development Livermore, California	Discuss reactor development work and product specifications	J. Q. Cope	8-10-53	9-12-53	X		
P. F. Gast to: Whitney Project Livermore, California	Discuss reactor development work and product specifications	E. Teller	8-11-53	8-11-53	X		
P. F. Gast to: North American Aviation Downey, California	Discuss reactor development work and product specifications	C. Starr	8-13-53	8-14-53	X		
P. F. Gast to: Radiation Laboratory Berkeley, California	Discuss reactor development work and product specifications	I. Pearlman	8-12-53	8-12-53	X		
W. T. Kattner to: Feed Materials Production Center National Lead Company Fernald, Ohio	Metal quality discussions and development of uranium fabrication techniques	G. W. Wunder	7-20-53	1-1-54	X		
W. T. Kattner to: Argonne National Lab. Chicago, Illinois	Metal quality discussion and development of uranium techniques	B. W. Dunnington	7-20-53	1-1-54	X		

Ja-20

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
W. T. Kattner to: Mallinckrodt Chemical Wks. St. Louis, Missouri	Metal quality discussion and development of uranium fabrication techniques	W. M. Leaders C. H. Harrington	5-10-53	1-1-54	X		
D. C. Kaulitz to: Phillips Petroleum Co. Arco, Idaho	Contact engineering at Material Test Reactor on design of test facility being developed by Mechanical Development	B. Lewis	8-10-53	8-12-53	X		
W. R. Lewis to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor research development program	B. R. Prentice K. H. Kingdon	8-3-53	8-7-53	X		
J. W. Lingafelter to: Battelle Memorial Inst. Columbus, Ohio	Welding consultation	G. B. Grable	8-4-53	8-5-53	X		
R. C. Livington to: Phillips Petroleum Co. Arco, Idaho	Contact engineering at Material Test Reactor on design of test facility being developed by Mechanical Development	B. Lewis	8-10-53	8-12-53	X		
G. E. McCullough to: Brush Beryllium Co. Cleveland, Ohio	Discuss beryllium-aluminum alloys	N. W. Bass	8-21-53	8-21-53	X		
G. E. McCullough to: National Lead Company Fernald, Ohio	Discuss metal quality program	R. L. Kirk	8-18-53	8-20-53	X		
R. H. Moore to: Knolls Atomic Power Lab. Schenectady, New York	Discuss general analytical problems	B. F. Rider S. S. Jones	8-18-53	8-19-53	X		
A. W. Thiele to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss technical problems on neutron spectrum measurements	J. M. B. Kellogg	8-31-53	9-1-53	X		

Ja-21

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. R. Triplett to: Nuclear Development Associates, Inc. White Plains, New York	Discuss reactor calculation methods	G. Young	8-5-53	8-6-53	X		
G. E. Wade to: Phillips Petroleum Co. Arco, Idaho	Contact engineering at Material Test Reactor on design of test facility being developed by Mechanical Development	B. Lewis	8-10-53	8-12-53	X		
W. K. Woods to: California Research and Development Livermore, California	Discuss reactor evaluation and product specifications	J. Q. Cope	8-10-53	8-11-53	X		
W. K. Woods to: Whitney Project Livermore, California	Discuss reactor evaluation and product specifications	E. Teller	8-11-53	8-11-53	X		
W. K. Woods to: North American Aviation Downey, California	Discuss reactor evaluation and product specifications	S. Siegel A. B. Martin	8-20-53	8-20-53	X		
E. A. Eschbach to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on fuel element development program	J. E. Burke C. E. Lacy D. W. White	4-1-53	10-1-53	X		
E. A. Eschbach to: Battelle Memorial Inst. Columbus, Ohio	Consultation on fuel element development program	H. R. Nelson	4-1-53	10-1-53	X		
E. A. Eschbach to: Ames Laboratory Ames, Iowa	Consultation on fuel element development program	F. H. Spedding	4-1-53	10-1-53	X		
E. A. Eschbach to: Sylvania Electric Products Bayway, New Jersey	Consultation on fuel element development program	H. H. Hausner	4-1-53	10-1-53	X		
W. R. De Hollander to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss vacuum tank design procurement and use for P-10 facilities	M. Roy	8-17-53	8-18-53	X		

[redacted]

HW-29053

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visits to other Installations							
W. M. Harty to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on 234-5 process equipment and specifications and 234-5 technology	I. B. Venable	8-13-53	8-14-53	X		
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visits to other Installations							
M. D. Fitzsimmons to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	8-3-53	8-4-53	X		
H. H. Hubble to: Vitro Corporation of America New York, New York	Design consultation on Project	J. C. Tourek	8-4-53	8-8-53	X		
C. E. Love to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	8-3-53	8-4-53	X		
M. D. Fitzsimmons to: Puget Sound Navy Shipyard Bremerton, Washington	Modification to drillers CA-512-R	S. L. Allison	8-18-53	8-19-53	X		
C. E. Love to: Puget Sound Navy Shipyard Bremerton, Washington	Modification to drillers CA-512-R	S. L. Allison	8-18-53	8-19-53	X		
MANAGEMENT AND LEGAL DEPARTMENT							
I. Visitors to this Works							
H. E. Scott Knolls Atomic Power Lab. Schenectady, New York	Conference on prime contract	G. C. Butler	8-19-53	8-21-53	X		100-H 105 200-W 231, Redox, 221-U 300 303

Ja-23

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
K. R. Van Tassel Knolls Atomic Power Lab. Schenectady, New York	Consultation on Hanford assistance to KAPL	W. E Johnson	8-3-53	8-5-53	X	100-B 100-D 100-H 101 100-F 200-E 200-W Redox, 235 300 300-L	105-B, 105-C, 108 105, 189 105 105 201-C 221-T, 231, 221-U, 234, 303 303
S. McMakin General Electric Company Schenectady, New York	Contract negotiations	W. E. Johnson G. C. Butler C. A. Priode	8-18-53	8-21-53	X	100-H 200-W 300	105 231, Redox, 221-U 303
E. L. Lindseth Cleveland Illuminating Company Cleveland, Ohio	Consultation on reactor power studies	W. E. Johnson	8-3-53	8-7-53	X	100-B 100-H 200-W 300	105-C 105 Redox 303

MANUFACTURING DEPARTMENT

I. Visitors to this Works

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
R. A. Ahrens Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W.N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303
J. H. Christensen Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
M. Duck Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303
T. J. Henry Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303
W. R. Johnson Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303
E. E. Kazmierczak Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 300 303
W. B. Leng Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 100-D 100-F 100-H	105-B, 105-C 105 105 105
			8-19-53	8-19-53	X	200-W 300	231, Redox, 221-U 303

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass. Areas
J. J. Rasmussen, Jr. Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U 300 303
J. W. Richards Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U 300 303
T. M. Shepherd Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U 300 303
J. W. Stacey Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U 300 303
R. L. Teal Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-B 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass Areas
L. M. Warner Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U 300 303
J. Yankovich Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E.T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U
G. L. Yeo Knolls Atomic Power Lab. Schenectady, New York	Training and assistance in 100 Areas	J. H. Warren E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
			8-19-53	8-19-53	X	200-W 231, Redox, 221-U
A. V. McKeon Navy Reactor Group Schenectady, New York	Training for responsibilities of radiation protection for Submarine Intermediate Reactor for US Navy	P. C. Jerman L. V. Barker J. G. Myers A. R. Keene	7-13-53	9-3-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 200-E 201-C 200-W 221-T, 221-U, Redox 300 303
M. W. Tucker Navy Reactor Group Schenectady, New York	Training for responsibilities of radiation protection for Submarine Intermediate Reactor for US Navy	P. C. Jerman L. V. Barker J. G. Myers A. R. Keene	7-13-53	9-3-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 200-E 201-C 200-W 221-T, Redox, 221-U 300 303

II. Visits to other Installations

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
E. P. Lee to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on personnel matters and inspection of facilities	K. R. Van Tassel	8-17-53	8-19-53	X		
W. N. Mobley to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on 234-5 process equipment and specification and 234-5 technology	I. B. Venable	8-13-53	8-14-53	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
F. P. Seymour General Electric Company Schenectady, New York	Development work in materials and processes	H. M. Parker	8-3-53	8-7-53	X	100-F 108 300-L XXX	
II. Visits to other Installations							
L. K. Bustad to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss current biological investigations on toxicity of iodine and particle generators and measurements	C. L. Comar J. Furth S. R Bernard	8-4-53	8-4-53	X		
L. K. Bustad to: Brookhaven National Lab. Upton, Long Island, New York	Discuss current mutual biological investigations and toxicity of radio-iodine	A. Edelman L. E. Farr	8-31-53	8-31-53	X		
J. De Pangher to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss neutron measure-ments, scintillation counting and time of flight techniques	T. Needels L. Neher	8-31-53	9-1-53	X		
J. M. Smith, Jr. to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on 234-5 process equipment and specifications and 234-5 technology	I. B. Venable	8-13-53	8-14-53	X		

Ja-28

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
PLANT PROTECTION SECTION - UTILITIES AND GENERAL SERVICES DEPARTMENT							
I. Visits to other Installations							
S. B. Badgett to: Vitro Corporation of America New York, New York	Audit accountability records and arrange for close-out on sub-contract G-148 for security accountability	H. B. Lytz	8-31-53	9-9-53	X		

Ja-29

PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY - AUGUST 1953

A pipe connector order amounting to $89,259.29 was placed with Crane Co. in Chicago. An alteration to this order is being processed adding operational spares. This consolidation of requisitions will permit us to use up as much as possible of the material left over from the previous pipe connector order and will result in a lower unit price on a number of items. This action is being taken with the Commission's approval as every effort is being made to use up excess material from the Redox construction program.

A change in the ready-to-use date for Project CG-550, P-10 Facilities, has necessitated the authorization of Air Express and Rail Express shipments in order to meet construction dates.

Delivery of the first of four 30,000/40,000/50,000 KVA, 3 phase, 220 KV transformers on HWC 1707 has been delayed from January to February 1954 due to the draftsmen's strike in Pittsfield. A.E.C. is being contacted to determine the effect of this delay on the program in 100-K area.

Mine and railroad officials were contacted regarding an adequate supply of railroad cars for the movement of coal on our present contracts. Assurance was received that our coal would move in the proper equipment and be scheduled so as to maintain a steady flow and to keep unloading expenses to a minimum.

Information regarding our purchases from General Chemical Division of Allied Chemical & Dye Corporation during calendar year 1951 has been prepared and forwarded to A.E.C. This data was requested by the New York City Renegotiation Board.

Efforts to find new and satisfactory vendors for steel sleeves for the 300 Area line have resulted in one experimental order, which is being placed with Rottler Boring Bar Co., Seattle, Washington.

As a direct result of the Stock Adjustment Request program (assignment of departmental responsibility for Standby items and Spare Equipment Held in Storage) 32 Declarations of Excess were prepared covering 174 items valued at $14,756.47. The total number of items removed from stock as a result of this program is 322 amounting to $42,368.14.

Discussions were held with the Commission in regard to allocation of warehousing space in the 3000 Area Excess Yard for some of the "B" Block equipment presently located in the 101 Building and also for the equipment being ordered for the new Transportation facility.

Even though inventories of scrap metals in some mills have reached a new high, prices still remain fairly stable. Revenue received here from sale of ferrous and non-ferrous scrap metals is still on the high side. Favorable comments attribute this to the fact that our scrap offerings are usually clean and are as advertised.

PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPAREMENT
SUMMARY - AUGUST 1953

A total of 326 prospective bidders visited our surplus sales yard. This figure is an all time high.

The ABCD system of inventory control was instituted in General Supplies. This places emphasis of analysis and more frequent reorder on high value items representing large investment, with less analytical emphasis and less frequent reorder on low value items.

The program for utilizing stainless steel is making excellent progress. All material which could be used in operations stocks has been transferred. Blaw-Knox is now giving us store orders for steel we hold in stock.

Organization & Personnel	7-31-53	8-31-53	Change
Employees on Roll	289	287	-2

PURCHASING AND STORES SECTION
ADMINISTRATION
AUGUST 1953

Information regarding our purchases from General Chemical Division of Allied Chemical & Dye Corporation during calendar year 1951 has been prepared and forwarded to the Atomic Energy Commission. Data was requested by the New York City Renegotiation Board.

A special forecast of our requirements for replacement electron tubes for fiscal year 1954 was prepared and forwarded to the Commission.

The following table shows the dollar value of business, by cost category, and the number of procurement actions placed with different types of vendors. Dollar amounts are based on the net value of purchase orders and alterations as transmitted to A.E.C.:

August 1953	VENDOR TYPE			
Cost Category	Government Agency	Small Business	Big Business	Educational and other
$0 - $ 24.99	$ 16.00	$ 3,986.65	$ 1,417.08	$ 30.25
$25 - $ 499.99	349.21	76,859.90	39,455.67	393.90
$500 - $ 24,999.99	715.00	115,758.84	234,030.65	
$25,000 - $ Up			363,937.55	
	$ 1,080.21	$ 196,605.39	$ 638,840.95	$ 424.15
Number of Actions	5	1073	570	13

Vendor Contacts	176
Claims Processed	2
Damage Reports Processed	6
Over & Short Report Processed	2
Accounts Payable Requests Handled	245
Difference Slips Processed	50
Clearance Slips & Purchase Order Change Approvals	206
Material Exception Reports	221
Return Orders Issued	146

Shown below is a summary of the net value of procurement actions placed with vendors for manufactured or shelf items in the states of Washington, Oregon, Idaho and Other Areas.

State	Manufactured	Shelf	Total
Washington	$ 366,973.49	$ 105,427.14	$ 472,400.63
Oregon	103,259.66	19,084.16	122,343.82
Idaho	7.82	485.13	492.95
Other	185,142.13	56,571.17	241,713.30
Total	$ 655,383.10	$ 181,567.60	$ 836,950.70

Government Transfers	OR	ORC
	0	0

PURCHASING AND STORES SECTION
ADMINISTRATION
AUGUST 1953

	G	D	Total
Requisitions on hand 8-1-53			
Operations Procurement	666	0	666
Construction Procurement	0	123	123
A.E.C. Procurement	204	23	227
Total	870	146	1016
Requisitions Assigned during August			
Operations Procurement	1492	0	1492
Construction Procurement	0	295	295
A.E.C Peocurement	242	79	321
Total	1434	374	2108
Requisitions Placed during August			
Operations Procurement	1608	0	1608
Construction Procurement	0	284	284
A.E.C. Procurement	319	61	380
Total	1927	345	2272
Requisitions on hand 8-31-53			
Operations Procurement	550	0	550
Construction Procurement	0	134	134
A.E.C. Procurement	127	41	168
Total	677	175	852

	HW	HWC
Purchase Orders Placed		
Operations Procurement	1330	
Essential Material	35	
Construction Procurement		194
Local Purchase	11	2
Total	1376	196
Value of Purchase Orders Placed		
Operations Procurement	$ 327,794.62	
Essential Material	319,629.10	
Construction Procurement		$ 165,554.34
Local Purchase	47.73	24.60
Total	$ 647,471.45	$ 165,578.94

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	36	28	4	68
Essential Material	3		1	4
HWC Construction	16	9	5	30
Total	55	37	10	102

Value of Alterations Issued	Increase	Decrease	Total
HW Operations	$ 4,595.19	$ 7,271.31	$ 11,866.50
Essential Material	15,788.00		15,788.00
HWC Construction	13,555.35	2,694.59	16,249.94
Total	$ 33,938.54	$ 9,965.90	$ 43,904.44

Organization & Personnel	7-31-53	8-31-53	Change
Employees on Roll	29	30	+ 1

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
AUGUST, 1953

The pipe connector order amounting to $89,259.39 has been placed with Crane Company in Chicago. An alteration is being processed to this order adding operational spares, the object being to use up as much as possible the material left over from the previous pipe connector order stored at Crane Company's plant in Chicago. This action is being taken with the Commission's approval as every effort is being made to use up the excess material from the Redox Construction Program. By consolidating the two requisitions into one order we were able to obtain a lower unit price on several of the items because of the increased number being purchased.

A request has been received from the Project Engineering Unit of the Engineering Department to expedite material ordered on Project CG-550, P-10 Facilities. We are advised that the ready-for-use date is now November 1, 1953. Air Express and Rail Express shipments have been authorized in order to meet construction dates.

Under date of August 21, 1953, A.E.C. transmitted to the General Electric Company, the procedure "Utilizing CPFF Construction Contractors Stainless Steel". This procedure requested that we screen all purchase requisitions for stainless steel through Kaiser Engineers and Blaw-Knox warehouses. This, in our opinion, is not workable because of time requirements and has been discussed with A.E.C. for further clarification.

HWC 1707 covers four 30,000/40,000/50,000 KVA, 3 phase, 220 KV transformers. Due to the draftsmen's strike in Pittsfield from May 11 to June 15, the delivery of the first transformer was extended one month, from January to February 1954. Contacts are being made with A.E.C. to determine whether or not this delay of one month will interfere with the program in the 100-K area.

During the month of August requisitions assigned to the Construction Procurement Unit increased 32% over July, and requisitions placed during August increased 28% over July. Requisitions on hand at the end of August were approximately 9% more than those on hand at the end of July.

Organization and Personnel

	7-31-53	8-31-53	Change
Employees on Roll	12	12	0

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
AUGUST - 1953

Statistical and General

The workload of the unit has dropped substantially since the completion of the physical inventories of plant stocks. It is anticipated that the level will remain depressed for several months or until the inventories have stabilized and the normal ordering pattern is re-established.

Results of our continuing effort to find new and satisfactory vendors for steel sleeves for the 300 Area line have resulted in one experimental order, which is being placed with Rottler Boring Bar Company, Seattle. Additional orders of this type will be placed as vendors can be located.

The extension of our contract with General Chemical Division, Allied Chemical and Dye Corporation, for our requirements of Aluminum Nitrate Nonahydrate supplied to us from the Hedges, Washington Works, is being processed and includes our increased requirements. The basic data for the record of purchase is at hand and the approval of the Commission will be requested early in September. Following this approval, a formal modification to the contract will be negotiated.

Essential Materials contracts in process are as follows:

(1) Methyl Isobutyl Ketone — contract negotiated, approved by General Electric, and sent to the Commission for approval.

(2) Steam Coal — Commission approval has been granted for the placement of Items 2 and 3 and resulted in the award of 300,000 tons to Independent Coal and Coke Company and 260,800 tons to Kemmerer Coal Company. These awards have been made and shipments started on the basis of supplemental records of purchase approved by the Commission to cover the period required for contract negotiations. Item 1 approval has been held up by the Commission pending discussions with the CMSTP&P Railroad. As this item only covers 100,000 tons, our needs are presently being met from the other two vendors and a delay in the award is not serious.

(3) Sodium Bismuthate — a supplemental contract for increased quantity has been negotiated with General Chemical and the final draft copies are in the hands of the vendor for signature.

(4) Sodium Dichromate — the modification has been negotiated, approved by General Electric, and presented to the Commission for approval.

(5) Chlorine — supplemental contract has been negotiated and the the final draft copies received with signatures from Pennsylvania Salt.

(6) Ferrous Ammonium Sulphate — bids have been received on our requirements for the next twelve months and are being reviewed.

Organization and Personnel

	7-31-53	8-31-53	Change
Employees on roll	32	32	-0-

PURCHASING AND STORES SECTION
STORES UNIT
AUGUST 1953

Statistical and General

Preparations are being made to move furniture from warehouses in the excess yard to the Central Stores Warehouse. This will result in better storage and handling facilities.

The review of 12,500 kardex cards in Automotive Parts for determining excess material is 60% complete.

The movement of Standby material from 100-B Area to 100-H Area is 85% complete.

As a direct result of the Stock Adjustment Request program (assignment of departmental responsibility for Standby items and Spare Equipment Held in Storage) 32 Declarations of Excess were prepared covering 174 items valued at $14,756.47. The total number of items removed from stock as a result of this program is 322 amounting to $42,368.14.

Discussions were held with the Commission in regard to allocation of warehousing space in the 3000 Area excess yard for some of the "B" Block equipment presently located in the 101 Building and also for the equipment being ordered for the new transportation facility.

A Property Disposal Report was approved by the Commission on the residual scrap at the Hanford Rail Yard. This concluded the excessing program initiated by the Transportation Section at that location.

Fifteen formal lists of excess were transmitted to the Commission covering 4162 items valued at $298,283.43.

Even though inventories of scrap metals in some mills have reached a new high, prices still remain fairly stable. Revenue received here from sale of ferrous and non-ferrous scrap metals is still on the high side. Favorable comments attribute this to the fact that our scrap offerings are usually clean and are as advertised.

A total of 326 prospective bidders visited our surplus sales yard. This figure is an all time high.

The ABCD system of inventory control was instituted in General Supplies. This places emphasis of analysis and more frequent reorder on high value items representing large investment, with less analytical emphasis and less frequent reorder on low value items.

The program for utilizing stainless steel is making excellent progress. All material which could be used in operations stocks has been transferred. Blaw-Knox is now giving us store orders for steel we hold in stock.

Organization and Personnel	July 31, 1953	August 31, 1953	Change
Employees on Roll	203	200	-3

PURCHASING AND STORES SECTION

TRAFFIC UNIT

AUGUST 1953

STATISTICAL AND GENERAL

D. A. Knapp contacted mine and railroad officials regarding adequate car supply for the movement of coal on our present contracts. He was assured that the coal would move in the proper equipment and be scheduled so as to maintain a steady flow of coal and to keep our unloading expenses to a minimum.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of August amounting to $1,123.96. This makes a savings from September 1, 1946 to date of $1,749,174.21.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for August, 1953	Savings from 9-1-46 thru July, 1953	Savings from 9-1-46 to date
Limestone	Aragonite, Utah	320.00		
Machinery, C/L	San Francisco, Calif.	191.88		
Phosphoric Acid	Newark, Calif.	420.16		
Sodium Sulphate	San Francisco, Calif.	191.92		
		$1,123.96	$1,748,050.25	$1,749,174.21
2. Freight Bill Audit		614.72	113,228.06	113,842.78
3. Loss and Damage & over-charge claims		2,098.12	128,460.37	130,558.49
4. Ticket Refund Claims		438.82	32,261.44	32,700.26
5. Household Goods Claims			17,276.59	17,276.59
		4,275.62	$2,039,276.71	$2,043,552.33

Work Volume Report

Completed Travel Requests		158
Reservations resulting from above	Rail	68
	Air	149
	Hotel	170

1206050

PURCHASING & STORES SECTION
TRAFFIC UNIT
August, 1953

Work Volume Report (cont.)

Expense Accounts Checked		170
Household Goods & Automobiles	Movements Arranged Inbound	2
	Movements Arranged Outbound	4
	Insurance Riders Issued	2
	Insurance Bills Approved	3
Ticket Refund Claims	Filed	13
	Collected - Number	23
	Collected - Amount	$438.82
Freight Claims	Filed	14
	Collected - Number	7
	Collected - Amount	$2,098.12
	Over and Shorts Processed	6
	Damage Reports Processed	13
Freight Bill Audit Savings		$614.72
Freight Shipments Traced		25
Quotations	Freight Rates	219
	Routes	231
Bills Approved	Air Freight	1
	Air Express	21
	Boat	1
	Carloading	65
	Express	134
	Rail	232
	Truck	247
Carload Shipments	Inbound	301
	Outbound	2

Report of Carloads Received

Commodity	CMSTP&P	NP	UP	Total
Aluminum Sulphate	3	1	2	6
Anthrafilt	1	2	1	4
Asphalt	1			1
Bichromate of Soda	5			5
Caustic Soda	17	21	12	50
Chlorine	1		3	4
Coal			154	154
Furnace Liners		12	1	13
Lime, Hydrated	2	2		4

PURCHASING & STORES SECTION
TRAFFIC UNIT
August, 1953

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	TOTAL
Lime Rock			1	1
Machinery			2	2
Methanol			1	1
Methyl Isobutyl Ketone		1	1	2
Nitric Acid		14	13	27
Nitrate of Soda	2	2		4
Pallet Boards	1			1
Petroleum Naptha			1	1
Phosphoric Acid		1		1
Salt	1	1	1	3
Sodium Sulphate			1	1
Soda Ash	I	1		2
Steel Containers	I	1		2
Steel Partitions			1	1
Steel Plates		1		1
Sulphuric Acid	1			1
Valves	1			1
Merchandise Cars	5	2	1	8
Total	43	62	196	301

Organization & Personnel	7-31-53	8-30-53	Change
	11	11	0

1206052

55-408

U. S. ATOMIC ENERGY COMMISSION
HANFORD OPERATIONS OFFICE
RICHLAND, WASHINGTON

DATE: June 21, 1955

TO: DUDLEY

Subject: NOTICE OF CHANGE IN CLASSIFICATION

Notice has been received from the General Electric Company Non-Technical Document Review Board, Hanford Atomic Products Operations, Richland, Washington covering the following change in classification action effective March 10, 1955.

Hanford Document No. 5[illegible] G. E. Document No. HW-[illegible]

Doc. Date 8-17-53 Original Classification Restricted

Title or Subject: Transportation Section Monthly Report-August 1953

Author(s) or Originator W. E. Ries

Pages No-1 thru No-6 (X) Downgraded to Official Use Only

( ) Classification Cancelled

According to our records you have copy(ies) 9 of 12 Series --

INSTRUCTIONS.

Block out all present classification markings, which may be inconsistent with the changed classification indicated above, and re-mark in accordance with existing AEC Security Regulations.

REMARKS: This action applies only to the "Transportation Monthly Section" portion of doc. No. HW-29229 and does not effect the classification of any other parts of the report.

This document was transmitted to you from Hanford on 9-24-53
Registry No. _____

Lee E. Speer
LEE E. SPEER, Chief
Classified Document Control

1206053

TRANSPORTATION SECTION
MONTHLY REPORT
August 1953

GENERAL

Transportation Section personnel forces decreased from 507 to 498 by 2 transfers in, 1 reactivation - personal illness, 3 transfers out, 2 terminations, and 7 deactivations - personal illness.

A revised schedule of general ledger account numbers and titles was made on August 1, 1953. Instructions were subsequently issued on August 11, 1953 identifying the Transportation Sub-Accounts with these new numbers and titles. Establishment of this revised schedule leads toward a more standardized accounting procedure.

Satisfactory progress continued on the New Consolidated Transportation Facilities as Phase I of construction is proceeding on schedule. Opening of the bids on Phase II is scheduled for September 8. Bid proposals from equipment vendors are being checked almost daily and returned to A.E.C. Procurement. A special meeting was held on August 13 in the 760 Building to resolve differences relative to design, with representatives of the Atomic Energy Commission, Architect-Engineers, and the Transportation Section in attendance.

RAILROAD ACTIVITIES

Commercial cars handled during August were substantially below normal and decreased 16.5% over July as regular coal receipts were not resumed until August 24 following the annual coal miners' holiday and subsequent curtailment of shipments. Additional vacations were scheduled during this period of reduced activity plus granting a number of excused absences (without pay) in order to maintain a personnel force reasonably consistent with the available work load. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	207	10	10	182
Blaw-Knox	55	-	-	51
Grove-Shepard-Wilson-Kruge Co.	10	-	-	10
Haughton Elevator Co.	1	-	-	1
L. H. Hoffman Co.	2	-	-	2
L. A. Hopkins Co.	5	-	-	5
Kaiser Engineers	144	-	-	137
O. V. Libby Co.	3	-	-	2
Packard Pipe & Pump Co.	1	-	-	1
Soule Steel Co.	3	-	-	3
Steel Construction Co.	4	-	-	4
U. S. Army	7	-	-	7
A.E.C.-Kaiser Engineers	104	-	-	112
	546	10	10	517

1263054

Transportation Section

Process service was temporarily curtailed by production difficulties and actual cars handled decreased 36% over July which was the peak month to date.

Special service included the hauling and spreading of 38 cars of ballast to the 200-East and 300 Areas primarily for the construction of new trackage.

Total car movements including process service totaled 1,414 in August compared to 1,726 in July; 3,275 in June; 2,617 in May; 2,278 in April; 2,314 in March; 2,691 in February and 2,730 in January.

Locomotive 39-3730 was derailed in the 200-East Area on August 11 while spreading ballast. The damaged brake rigging was straightened and repaired the following day.

Completed the installation of new piston rings and ground the valves on locomotive 39-3730 on August 5 which were begun in July. This engine failed again in the field on August 13 and a subsequent inspection disclosed that one piston and liner had been scored. A new piston has been ordered; however, a thorough check of all damaged parts did not reveal any cause for the failure.

Locomotive 39-3731 failed in the field on August 18 because of dead batteries. A defective 80 ampere fuse in the auxiliary generator circuit caused the batteries to be completely discharged. The fuse was replaced and the batteries re-charged.

Routine inspection and minor repair services were performed on August 7 and 17 for the U.S.Army car operated off-plant by the Atomic Energy Commission. The latter inspection disclosed considerable lost motion in all truck parts and it was recommended that major repairs to the trucks and draft gear be performed at the earliest feasible date.

Locomotive 39-3732 collided with a construction transit mix truck at Station Pearl on August 10 and sustained damaged totaling approximately $777.00. The Atomic Energy Commission Investigating Committee charged the truck driver with responsibility for the accident.

Repairs to the railroad trackage damaged by the derailment of four runaway cement cars from the Central Mix Plant on June 2 have been physically completed and will be financially closed in September.

Replaced a No. 8 turnout with a No. 10 to connect the existing railroad to the Purex Project. Removed and restored necessary trackage to permit undertrack pipe laying by a construction contractor on the 200-East lead. These jobs were performed on work orders from the Atomic Energy Commission and required 253 man-hours.

Completed the disposal of excess railroad material from the Hanford Rail Yard and Station Willa to the 3000 Area requiring 274 man-hours.

Routine track maintenance activities included lining, surfacing, and dressing of trackage requiring 4,500 man-hours; installation of ties, rail, and other track materials requiring 347 man-hours; distributing and handling materials requiring 330 man-hours; weed control requiring 716 man-hours; removing sand and oiling switches requiring 255 man-hours; and special work orders requiring 368 man-hours.

Transportation Section

AUTOMOTIVE ACTIVITIES

The Plant Bus System transported 7.7% more passengers in August than in July. The following statistics indicate the magnitude of service rendered:

Passenger volume	141,482
Revenue - bus fares	$ 7,074.10
Earnings - transit advertising (July)	$ 251.63
Bus trips	6,630
Bus miles - passenger carrying	197,694
Passenger miles	4,907,487

The following is a comparative breakdown of average daily round trips to the Plant Areas:

Passenger buses - 100-B	11
Passenger buses - 100-D	12
Passenger buses - 100-F	11
Passenger buses - 100-H	8
Passenger buses - 100-K	6
Passenger buses - Hanford	1
Passenger buses - 200-West	31
Passenger buses - 200-East	5
Passenger buses - 300 Area	6
Passenger buses - Riverland	2
Passenger buses - White Bluffs	1
Passenger buses - North Richland	4
700-300 Shuttle	16
Inter-Area Passenger Shuttle & Express	2

Effective August 10, bus service for the 100-K Area was increased from the day shift only, Monday through Friday, to around-the-clock service seven days a week. This increased service required two additional round trip buses daily.

With the change in servicing railroad badges from the 200-West Area to the 300 Area, it became necessary for bus driver personnel to stop at the 300 Area Barricade to pick up and drop off these badges for the swing shift crew.

The Richland Bus System transported 1.6% more passengers in August than in July. The following statistics indicate the volume of service rendered:

Total passengers including transfers	8,345
Revenue - bus fares	$ 624.07
Earnings - transit advertising (July)	$ 12.43
Bus trips	1,194
Bus miles - passenger carrying	6,328
Passenger miles	26,864

Transportation Section

Off-Plant chauffeured automobile trips (Company business and/or official visitors)totaled 61 which were rendered to the following locations as indicated:

Benton City, Washington	5
Grandview, Washington	1
Hinkle, Oregon	7
Kennewick, Washington	5
Pasco, Washington	28
Pendleton, Oregon	10
Prosser, Washington	1
Sunnyside, Washington	1
Yakima, Washington	2
A.E.C. Airport	1

The following tabulation indicates the volume of Drivers Test Service rendered:

Applicants:	Male	43	Number tests given	51
	Female	8	Number rejected	0

Permits issued:	Limited to driving with glasses	15
	Unlimited	36

Permits reissued:	Rehires	10
	Expirations	246

The following tabulation indicates the volume of fuel distribution by Equipment Maintenance personnel:

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	51,525	21,890	16,600	1,080	190
Received during month	92,962	18,300	30,500	1,639	0
Dispensed during month	102,222	18,250	27,200	1,439	60
Stock at end of month	42,265	21,940	19,900	1,280	130

The following tabulation indicates the volume of inspection and maintenance service rendered to Hanford Atomic Products Operations automotive and heavy equipment by Equipment Maintenance personnel:

Motor overhauls	35
Class A Inspections and Repairs	106
Class B Inspections and Lubrications	1044
Bi-weekly Inspections - buses	139
Other routine maintenance repairs and service calls	1893
Accident repairs and paint jobs	40
Tire repairs	465
Wash jobs	505
	4,227

Transportation Section

The following tabulation indicates the Plantwide usage of automotive equipment:

Code	Type	No. of Units	Total Mileage
1A	Sedans	336	533,178
1B	Buses	91	206,077
1C	Pickup Trucks	460	279,398
1D	Panel,Carryall,Sta.Wagon	129	162,677
1E	Armored Cars	1	157
1G	Jeeps	2	857
68 Series	Trucks	207	171,684
		1,226	1,354,028

Completed major repairs to two regulated motor cranes in the 200-West Area under SWP conditions. Other major heavy equipment repairs included one roller and one fork lift.

Completed the installation of dual axles under trailer 64-2750 for the 300 Area. This expenditure of $2,344.66 raised the capacity of this unit from 11 tons to 20 tons and increased the valuation to approximately $4,700.

Completed the acquisition of 24 additional sedan delivery trucks. Twenty-three of these units have been placed in service as replacements for sedans, pickups, and panels, which were less suited for the job being performed. The remaining vehicle was assigned to the Radiation Monitoring Unit of the Separations Section in accordance with the FY 1954 Equipment Budget. The 23 released units have been temporarily assigned to the Repair Pools.

Six additional DC vehicles were authorized to receive maintenance services by Transportation forces thus increasing the total to 29 of which 18 are assigned to the 700 Area Motor Pool.

The 300 Area Motor Pool was relocated near the 300-L Badge House on August 27 to convenience users.

Studies on the Richland-Outer Area Parking Lot Motor Pool and on passenger carrying vehicles which are scheduled for replacement during FY 1954 are still in progress.

Considerable time was expended by the Records and Control Unit in assisting the Internal Audit Unit in auditing cost codes, motor pool trip tickets, etc.

Transportation Section

LABOR ACTIVITIES

The following tabulation indicates in tons the volume of road asphalt material handled by Road Maintenance personnel:

	MC 1	MC 3	MC 4	MC 5
Stock at start of month	0	35.26	0	28.63
Received during month	0	38.22	0	0
Used during month	0	54.08	0	9
Stock at end of month	0	19.4	0	19.63

The following tabulation indicates the volume of road aggregate materials handled by Road Maintenance personnel:

	3/4" to 0 Pre-mix Tons	½" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	399	107	100	6,701	1,979.66
Made during month	724	349	645	0	0
Used during month	817	360	16	363	863.66
Stock at end of month	306	96	729	6,338	1,116

Maintenance of primary roads required 622 man-hours; secondary roads 52 man-hours; Manufacturing Area walkways, parking areas, and related work 650 man-hours.

Miscellaneous labor and equipment services for 300 Area required 1162 man-hours.

Movement of equipment and material and other miscellaneous labor services for the 100 and 200 Areas required 294 man-hours.

Administration Area maintenance services required 979 man-hours; ice handling 96 man-hours; mosquito control 342 man-hours; and miscellaneous work orders for the Community 62 man-hours.

Handling of materials and equipment for the Stores Unit included 7 carloads and 279 truckloads and required 2,555 man-hours.

The daily trucking service between Richland and the Manufacturing Areas handled 263 cases of acid, 1,724 cylinders of compressed gas, and 710 tons of operational supplies requiring 1,725 man-hours.

The handling of office furniture, equipment, and records involved 250 moving jobs requiring 910 man-hours.

The removal of silt and ground from the 300 Area retention basin was begun on August 10 and is about 60% complete. Approximately 10,000 yards have been removed to date requiring 387 man-hours.

[redacted]

[redacted]

DECLASSIFIED

HW-29229-D

Copies #1 - 12-Plant Monthly
13-HD Middel
14-RB Britton
15-FJ Mollerus
16-AEC
JI Thomas
17-700 File
18-300 File
19-HA Carlberg
20-O Mageehon
21-ES Staples

September 4, 1953

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

AUGUST 1953

GENERAL

The Section total work force was one hundred and sixty-nine (169) as of August 31, no change from the previous month.

A new process load power peak was established during the month, exceeding the previous billing demand of last April by approximately 2,700 KW.

Date	Demand KW	July Comparative KW Demand
8-21-53 (10:30 AM-11:00 AM)	111,000	108,125

W. L. Owens, journeyman lineman, was promoted to line foreman on August 1, 1953. The method set forth in the "G.E. Selection Program for Supervisors" manual was followed in making the choice among candidates.

The Stromberg-Carlson Company submitted a low bid of $265,280.21 to fabricate equipment for the new official telephone exchange.

The General Telephone Directory Company who offered to pay $20,600.00 was awarded the contract to publish four issues of a Richland telephone directory.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

Unusual electrical storms experienced during the month caused the following incidents:

Loss of power to 100-K and White Bluffs construction areas for three hours during the night of August 7.

Over 400 security fence and barricade lights required servicing during August.

[redacted]

[redacted]

[redacted]

ELECTRICAL DISTRIBUTION UNIT (Cont'd.)

Loss of power to the 181-BC Building on August 9, due to a fatigued fuse, resulted in no loss of production.

A two hour interruption of power through the Army substation at North Richland occurred on August 19, when a 7.2 KV breaker faulted.

A one minute interruption of power to 200-E Area occurred on August 19 when lightning struck the line.

Two Areas scrammed and resumed operations on August 27 when lightning struck the Columbia-Coulee No. 3 and No. 4 lines.

An inspection of the 230 KV system, preparatory for the K Areas additional loads, is being made. A weakness has been discovered in the original vertical riser T-type connectors caused by corona action. Sixty such connectors will be replaced with a Y-type connector over a three month period. It is estimated that the savings derived from the use of the industrial monkey on this job alone will justify the procurement of this vehicle.

A near serious accident occurred on August 13 when a truck mounted aerial ladder was left partially extended and driven under a telephone cable. There was no damage to the cable but the lower ladder section was broken.

A low voltage condition survey was completed in the 100-B-C Areas and arrangements made for corrections.

System Expansion and Planning

The conversion from overhead to underground circuits and the rebuilding of street and fence light stations near the 284-W building was completed.

Two permanent 15 KV underground cables and two 750 KV transformers supplying power to the 2101 building were energized.

Design drawings and contract specifications for the KE and KW Area substations and taps were reviewed.

TELEPHONE UNIT

Maintenance and Operation

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	5869	972	68	295	3902
N.Richland	346	255	142	26	458
Process Areas	30	1663	387	--	1545
Total	6245	2890	597	321	5905

[redacted]

TELEPHONE UNIT (CONT'D.)

Richland Exchange four-party service:

	August 23, 1953	July 23, 1953
Number of Subscribers	946	911
Number of Vacant Sides	154	153

One hundred and thirteen (113) new requests for residential telephone service were received, making the backlog two hundred and seventy-four (274). During the month solicitation resulted in three residential lines being changed to four-party service.

Service orders during the month were as follows:

Residential and Commercial	332
Official (Permanent)	280
Official (Temporary)	129
Total	741

System Expansion and Planning

The following work was done on the fifth and sixth housing program facilities:

1. Added iron work to the main distributing frame to support the additional protectors.
2. Made up fifteen 101-pair tip cables.
3. Began testing and verifying the underground and aerial distribution systems to serve the M-1 and K-4 Areas.

Two 26-pair cables serving the uptown shopping district were replaced with a 101-pair cable. The additional facilities will be required to serve the new Richland Development Company building.

Twenty-five lines and fifty telephones were installed in the new 2101 Building in 200-E Area. Fifty PBX lines, twenty direct dial lines, and approximately one hundred instruments were installed for Blaw-Knox in the new Purex Area at 200-E. The PBX trunk circuits were modified and pulsing tests made.

A special telephone intercommunicating system which provides for scattered call telephones was designed for the Village Taxi Company.

Equipment was ordered and instructions given for adding "busy flash" to the Richland Exchange to meet requirements for intertoll dialing.

[redacted]

[redacted]

TELEPHONE UNIT (CONT'D.)

Other planning activities were:

1. Preparation of installation instructions for a new four-position manual switchboard at the 100-K construction job-site.

2. Preparation of design data and orders for serving the new Richland Labor Hall with a 16-pair cable.

3. Reviewed design data for the proposed 100-K to 100-B telephone cable.

R B Britton
ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

RB Britton:MAW*ag

POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING AUGUST 31, 1953

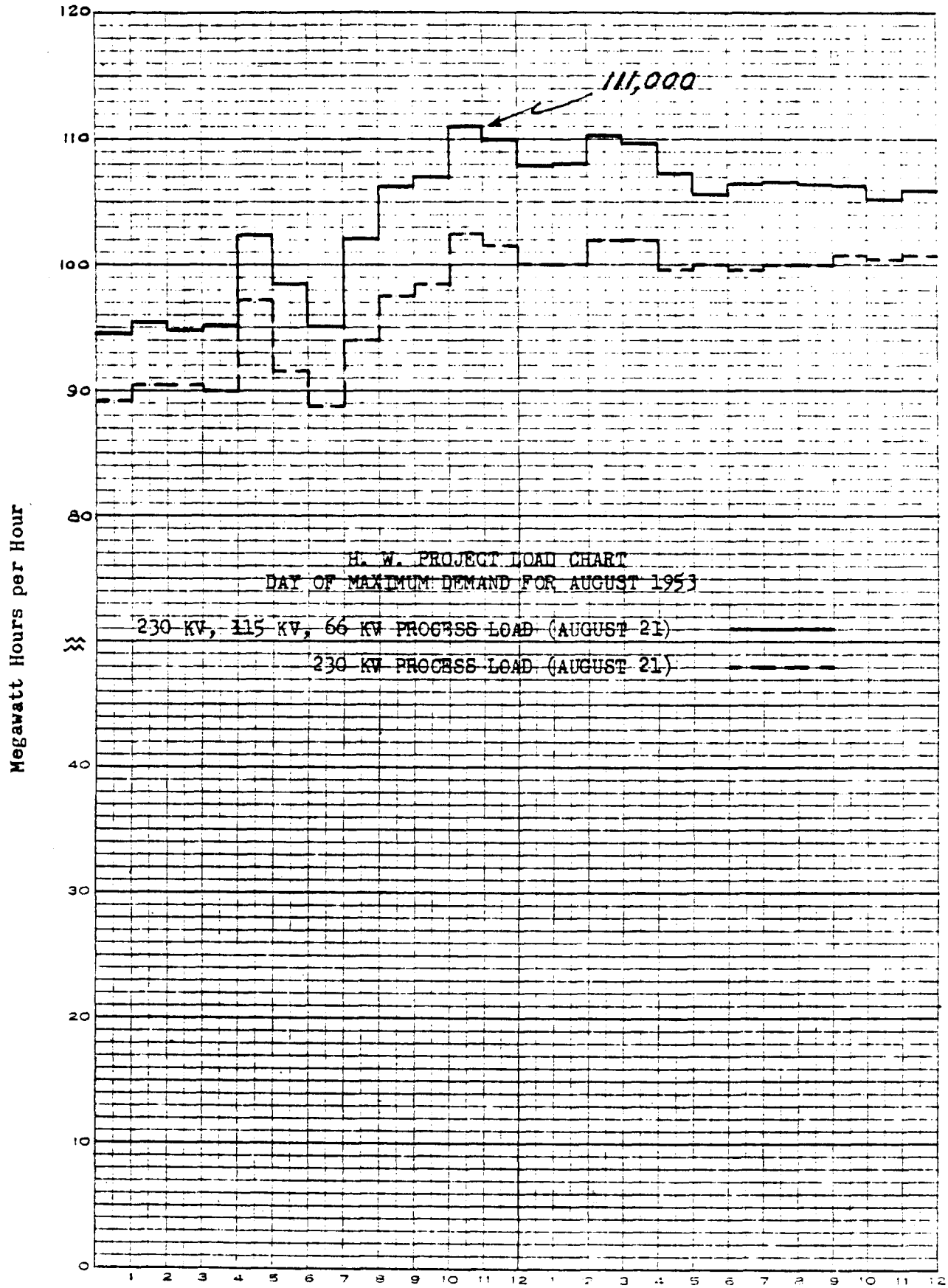
744 Hours

	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)	30025	30055	45200	45300	89.3	89.2
A-4 Out (100-D)	16540	16420	24700	24400	90.0	90.4
A-5 Out (100-H)	9972	9936	14450	14550	92.8	91.8
A-6 Out (100-F)	7880	7930	11900	11700	89.0	91.1
A-8 Out (200 Area)	5436	5400	9000	9360	81.2	77.5
TOTAL OUT	69853	69741	105250**	105310**	89.2	89.0
MIDWAY IN	70948	70468	100800*	102400*	94.6	92.5
Transm. Loss						
Percent Loss						
115 KV System						
B1-S4 Out (N. Rich.)	1483	1507	2765	2822	72.1	71.8
B1-S5	94	108	475	518	26.6	28.0
Richland	7240	7474	13760*	15040*	70.7	66.8
BB3-S4 Out (300 Area)	1312	1360	2880	2800	61.2	65.3
TOTAL OUT	10129	10449	19880**	21180**	68.5	66.3
Benton In	10480	10660	29200*	33600*	48.2	42.6
So. Richland In	-	-	1600*	-	-	-
TOTAL IN	10480	10660	30800**	33600**	45.7	42.6
Transm. Loss						
Percent Loss						
66 KV System						
B9-S11 Out (100-K)	582	744	1560	1760	51.8	55.0
B7-S10 Out (W.Bluffs)	330	366	1125	1103	40.7	43.2
Hanford Out	25	38	400**	300**	8.7	16.5
TOTAL OUT	937	1148	3085**	3163**	42.2	47.3
HANFORD IN	923	1129	2200*	2700*	58.3	54.4
Transm. Loss						
Percent Loss						
Project Total						
230 KV Out	69853	69741	105250**	105310**	89.2	89.0
115 KV Out	10129	10449	19880**	21180**	68.5	66.3
66 KV Out	937	1148	3085**	3163**	42.2	47.3
TOTAL OUT	80919	81338	128215**	129653**	84.8	84.3
230 KV In	70948	70468	100800*	102400*	94.6	92.5
115 KV In	10480	10660	30800**	33600**	45.7	42.6
66 KV In	923	1129	2200**	2700**	58.3	54.4
TOTAL IN	82351	82257	133800	138700	82.7	79.7
Transm. Loss						
Percent Loss						

*Denotes Coincidental Demand
**Denotes Non-Coincidental Demand

Average Power Factor-230 KV System 90.4
Average Power Factor-115 KV System 84.6
Average Power Factor- 66 KV System 87.9

[redacted]



H. W. PROJECT LOAD CHART
DAY OF MAXIMUM DEMAND FOR AUGUST 1953

230 ~~KV, 115 KV, 66 KV PROCESS LOAD~~ (AUGUST 21) ——————

230 ~~KV PROCESS LOAD~~ (AUGUST 21) — — — —

1203005

[redacted]

[redacted]

PLANT AUXILIARY OPERATIONS DEPARTMENT
STATISTICAL AND COMPUTING SECTION

MONTHLY REPORT - AUGUST, 1953

Personnel Statistics

Following is the month end summary of personnel:

Statistical and Computing Section

Unit	As of 7-31-53			As of 8-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	1	1	2	1	1	2	0	0	0
Statistics	8	5	13	8	9	17	0	+4	+4
Computing	19	42	61	19	33	52	0	-9	-9
Graphics	1	11	12	1	11	12	0	0	0
Procedures	10	4	14	10	4	14	0	0	0
TOTAL	39	63	102	39	58	97	0	-5	-5

Statistics Unit

	As of 7-31-53			As of 8-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	2	3	1	3	4	0	+1	+1
Administrative	3	0	3	3	0	3	0	0	0
Statistics	1	2	3	1	1	2	0	-1	-1
Precision & Quality Control	3	1	4	3	1	4	0	0	0
Technical Statistics	0	0	0	0	4*	4	0	+4	+4
Numerical Analysis									
TOTAL	8	5	13	8	9	17	0	+4	+4

* Includes one rotational trainee.

Effective August 31, 1953 the mathematical functions of the Computing Unit were transferred to the Statistics Unit. A total of five non-exempt personnel were transferred (includes one technical graduate on the rotational training program), to the Numerical Analysis function.

One technologist was placed on leave of absence effective 8-21-53.

[redacted]

Computing Unit

	As of 7-31-53			As of 8-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	2	2	4	2	1	3	0	-1	-1
Analysis and Programming	11	6	17	11	3	14	0	-3	-3
Operation	6	33	39	6	29	35	0	-4	-4
Rot. Training	0	1	1	0	0	0	0	-1	-1
TOTAL	19	42	61	19	33	52	0	-9	-9

One general clerk terminated 8-7-53, one key punch operator terminated 8-14-53, and two tabulating machine operators terminated 8-26-53. One general clerk, one technologist, two technical graduates and one rotational trainee were transferred from the Computing Unit to the Statistics Unit effective 8-31-53.

W. C. McGee attended a symposium on the card programmed calculator sponsored by the IBM Corporation at Endicott, New York, on August 17 through August 20. He read a paper on the SEMAC I system used at the Hanford Atomic Products Operation.

R. Y. Dean attended a joint meeting of several mathematical societies, including the American Mathematical Society, the Institute of Mathematical Statistics, the American Mathematical Association, and the Econometric Society, at Kingston, Ontario, August 31 thru September 5.

Graphics Unit

	As of 7-31-53			As of 8-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	1	2	0	0	0
Illustrators	0	9	9	0	9	9	0	0	0
Graphic Designer	0	1	1	0	1	1	0	0	0
TOTAL	1	11	12	1	11	12	0	0	0

One graphic illustrator was hired effective 8-3-53 one one graphic illustrator terminated effective 8-28-53.

Procedures Unit

	As of 7-31-53			As of 8-31-53			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
Engineering Assistant	0	1	1	0	1	1	0	0	0
Procedure Analyst	9	0	9	9	0	9	0	0	0
TOTAL	10	4	14	10	4	14	0	0	0

FOR THE MANUFACTURING DEPARTMENT

Statistical work in connection with the 305 test pile is being reviewed at the request of the Process Unit of the Metal Preparations Section. The purpose of the study is to determine to what extent test pile variations should be investigated.

The routine monthly report on 300 Area Production for the month of July was issued. (HW-28994, "Statistical Quality Report 300 Area," W. W. Windsheimer from Statistics Unit.) Machining yields and oxide results have been deleted.

Reactor data, in the form of temperature maps and panellit gauge readings, were received from B, D, DR, and F reactors this month. Using essentially the same procedure for all reactors, the data has been processed to yield individual tube flows and powers. With these quantities, the usual surveys of header and cone screen plugging were made, and one and two-digit maps of the reactor face prepared. The plugging surveys are presently being used to assist the Operations Section in maintenance work during shutdown. For B reactor, a prediction was made of tube flows necessary to maintain a safe water temperature rise while operating at a considerably higher power level. These results, along with the other information, will be used in re-orificing B reactor, and in the study of a proposed re-distribution of water flow through its cross-headers. The result obtained from DR reactor data will be used in analyzing the feasibility of reducing header pressures on that reactor. Such a program would reduce the total water flow without lowering the power level, thereby effecting immediate savings in pumping and steam production. Tube factors, used as a guide in flattening operations, were calculated from DR reactor data.

Computational work has been completed on the expected activity of buried dummy slugs. On the basis of the results obtained, it was shown that these slugs can be reclaimed after a reasonable storage time without subjecting the reclaiming personnel to a radiation hazard.

A critical examination is being made of sampling methods to obtain a valid estimate of impurity concentration in the shapes from the 234-5 process. Experience data on impurity content at the top and bottom of the piece indicates that in many cases a single sample would be sufficient to estimate the concentration. It is expected that this study will result in a procedure which will greatly expedite this sampling process. The precision obtained by the use of an experience factor to estimate the plutonium content of the shapes is also being considered.

It is desired to list the true yields for task III of the 234-5 process, as distinguished from lower yields due to process error or equipment failure. Occasionally an equipment failure or process error is not noted, but a low yield occurs which tends to indicate that something in the process was not correct. Criteria for judging which yields can be considered as not being true process yields were determined, based on experience data for six consecutive weeks. (Letter 8-26-53 from J. L. Jaech to C. L. Brown, "To Distinguish Between Task III Reduction Yields and Lower Yields Due to Processing Error or Equipment Failure.")

A study ("Statistical Review of Geometry and Background in Alpha Hand Counters", from N. D. Peterson to W. G. Westover, dated August 25) was performed for the Radiation Monitoring Sub-Section to investigate the presence of the conditions required for the use of the counting plans previously provided. Empirical findings fail to indicate any need to alter the conditions on which the plans were based.

Work continued on a study of power material consumption patterns for the Manufacturing Department Staff. The object of this study is to analyze the seasonal consumption patterns of certain power materials to provide an aid in forecasting their future use.

A set of thirteen large lecture charts were prepared for covering actual cost and production figures for FY1953 and including bogeys for FY1954. Routine work included layout, inking and plotting of figures to the "1954 FY Manufacturing Department Control Charts" master plates.

38 hours were spent on forms design for the Manufacturing Department.

FOR THE ENGINEERING DEPARTMENT

Mathematical and computational work has begun on another harmonic analysis for the Graphite Studies group. The object of this study is to obtain a mathematical expression for the dispersion of a parallel x-ray beam after reflection from a block of irradiated graphite. One complicating factor is the presence of pronounced peaks in the reflection pattern, which must be separated analytically from the rather broad background. Using ordinary analytical methods would result either in low-precision results at a moderate cost, or good accuracy at enormous expense. A new method, however, has been devised especially for this problem and will be applied to obtain good accuracy at moderate cost.

The study of chemical impurities in metal produced by Mallinckrodt Chemical Works is continuing. Computations on the data for the months of April, May, and June, 1953, have been completed and a formal report will be issued as soon as these data can be analyzed and combined with the data from the previous fifteen months. This work is part of a larger study of the relationship between metal quality and the behavior of the metal during canning and irradiation.

Numerous curves from dilatometric data showing the change in length of production material due to increases in temperature were computed. (Memo, "Dilatometric Curve Fitting," to R. Hueschen from Virginia Clark, dated August 10, 1953.)

Charts and graphs were provided the Reactor Design and Development Unit for the purpose of making inferences about lot quality from a random sample from the lot. For various sampling rates confidence limits were determined on the proportion of defective items in the lot. (Letter from F. H. Tingey to R. K. Anderson, "Sample Sizes Vs Lot Defectives," dated August 13, 1953.)

[redacted]

Further consultations were held and preliminary studies made on non-destructive methods of estimating the amount of U_{235} in the enriched fuel slugs presently being received at Hanford Atomic Products Operation. Past experience data were used to investigate the feasibility of a weight-volume method of determination. Assuming a fixed ratio of U_{238} to U_{235} in the enriched slugs and accurate determinations of the densities of aluminum and uranium in the slugs it appears that a method depending on the density might be adequate. The proposed equation will be firmed up by actual uranium content determinations on several fuel slugs.

Integrals involving the familiar fission neutron energy distribution have been evaluated numerically. This distribution, given by the expression $e^{-E}\sinh\sqrt{2E}$, where E is the energy of the neutrons, is used extensively in the determination of effective cross sections of reactor materials. By coincidence, it was possible to make use of these calculations for a different problem, thereby saving the delay and expense of an initial investigation in the latter case.

Statistical analyses were made on data giving the thickness in mils of metal dissolved from four positions around the circumference of four tubes. Differences in the amount of metal dissolved around the circumference of the tubes, differences between tubes, differences in the thickness of the metal dissolved along the length of the tube and the precision of the measurements were determined. (Letter, "Statistical Analysis of Thickness of Metal Dissolved from Tubes," to N. Groves from V. Clark, dated August 28, 1953.)

At the request of the Advance Technology Sub-Section, calculations were made which are a part of a larger problem on resonance escape probability in an enriched reactor. The calculations required the extension of an existing table of Bessel function integrals, which were subsequently used in the numerical evaluation of other integrals. Calculations were made to investigate the feasibility of "spike" enrichment in a reactor employing internally cooled slugs. For a given lattice spacing and central zone buckling, the radius of the enriched annulus was determined from the one-group criticality condition. Other information supplied was the number of tubes in the flattened region, and the number of enriched and natural tubes in the enriched annulus.

An extensive investigation into the literature on the transport theory of neutron diffusion is being made at the request of the Theoretical Physics group to prepare for mathematical analysis of the hollow slug design.

Work is proceeding on a reactor design problem in which the water pressure drop and the water quality along a tube are sought. These quantities are expressed in differential and transcendental equations, which assume different forms depending on the section of the tube being studied. The equations are being solved by step-by-step integration along the tube. To date, calculations for the first two sections of the tube have been completed. This study is the most comprehensive one of its kind made here to date, and it is hoped that the results will obviate many of the semi-empirical techniques employed heretofore in dealing with the boiling problem.

Probabilistic considerations were utilized in determining the practicality of installing a panellit gage back-up system in the reactors to prevent gross boiling damage in the process tubes. In terms of cost of installation, estimated financial loss resulting from a gross boiling damage incident, experience as to frequency of occurrence of events that could lead to boiling damage, and proposed pile operating conditions over the period considered, the expected financial gain (or loss) per pile resulting from the installation was determined as a basis for decision. (Secret Rough Draft HW-29069 from F. H. Tingey to M. E. Forsman, dated August 8, 1953, "Expected Financial "Gain" Resulting From an Installation of a Back-up System in the Reactors to Prevent Gross Boiling Damage.")

Computational work on the solution of the pile characteristic equation has been completed. At the time of the original start-up of each reactor, the negative reactivity of each safety rod was determined, thus establishing a maximum safe operating limit. Over a period of time, the characteristics of these rods can be expected to change. With the results of these calculations, it will be possible to re-evaluate the effect of the safety rods and thus determine more applicable operating limits. Approximately 18,000 results were obtained from these calculations, requiring over 16 million arithmetic operations. Based on the total cost of the problem, each of these operations costs .02 cents. While this problem would never have been done by hand, it is interesting to note that the cost of hand computing would have been over a half-million dollars.

Additional calculations were made on header data from D reactor. Information requested included the average outlet temperature of each header, the accumulated riser flow at each header, the header flow, and quantities indicating those tubes with undesirable heat transfer properties. This study is being made to determine unusual flow and temperature conditions in D reactor cross headers.

Discussions were held with the Fuel Examination Sub-Unit relative to proposed handling of data to be associated with the 105-C inspection basin. All pertinent pre-and post-exposure data for a small number of slugs will be collected and a routine procedure for punching and tabulating such data will be determined. It is anticipated that an analysis of these data will shed more light on what variables are important and should be tabulated for future analysis when the large scale slug examination program gets underway.

A statistical analysis of data contained in Secret Document HW-28675, "Ruptured Slug Data and Comparative Rupture Rates for May-June, 1953," was made in order to gain more information on the slug rupture problem. (Letter from J. L. Jaech to L. W. Lang, "Questions Pertaining to HW-28675," dated August 31, 1953.)

The expected increase in rupture rate due to penetration was found for various increases in power level and total exposure. Probability statements giving the degree of confidence with which it can be stated that the expected rupture rate will fall below a certain level were obtained. (Letter from J. L. Jaech

to L. W. Lang, "The Effect of Increase in Power and Exposure on Rupture Rate Due to Penetration," dated August 27, 1953.) Increasing the outlet water temperature is expected to increase the rupture rate. It is desired to keep the true rupture rate below 0.02. Criteria were derived for judging how many ruptures may occur in N tubes before it can be concluded that the true rupture rate is greater than 0.02, where N takes on certain values between 10 and 300. (Letter from J. L. Jaech to L. W. Lang, "Testing Whether or Not the True Rupture Rate is Below 0.02," dated August 28, 1953.)

The problem of the frequency with which excessive temperatures can be expected in pile operations was considered. The absolute limits on certain temperature components affecting the over-all pile temperature were given. The computed expected frequencies depended on a basic assumption regarding the rate of fluctuation of these temperature components. The method analysis was such as to allow for flexibility in the basic assumptions. (Restricted letter from J. L. Jaech to S. S. Jones, "Expected Frequency of Excessive Temperatures Produced by Local Power Surges," dated August 24, 1953.)

A problem relative to the gamma absorption coefficient for various materials is being studied. The statistical problem is to determine the precision of a slope estimate in a regression equation when the independent variable is in error by a known fixed amount and the dependent variable has a precision which varies from determination to determination.

A critical examination of pile supervisors log books over the past few years is now being made in order to establish estimates of frequencies of events that could conceivably lead to a disaster in a reactor. This information will be utilized in the final evaluation of the probability of a plant disaster when sufficient information is available to make the evaluation feasible.

An exponential curve of the form $y = ab^x$ was fitted to data on corrosion rate vs. flux. Ninety-five per cent confidence limits were found for the parameters. (Letter from J. L. Jaech to S. Goldsmith, "Corrosion Rate of 2-s Aluminum Vs. Flux," dated August 12, 1953.)

The following problem was successfully solved for the Pile Technology Sub-Section: Given an event A occurring at random with expected frequency λ_1, and an event B independent of A occurring at random with expected frequency λ_2 find the expected frequency of the event consisting of A followed by B within a time t,(Solution communicated to S. S. Jones by C. A. Bennett on August 7, 1953.)

Data pertaining to RCU decontamination, RAW loss, and RCW loss in the TBP process were analyzed to determine which variables among those considered significantly affect uranium loss and beta or gamma decontamination. Most of the results were negative, which indicates that at least over the range of values of the variables considered, the variables considered had little effect on uranium loss or decontamination. (Restricted letter from J. L. Jaech to E. L. Burley, "Some Operating Variables Affecting RCU Decontamination, RAW Loss, and RCW Loss in the TBP Process,"dated August 5, 1953.)

Data were obtained from the RA column in the TBP process showing the percentage of uranium equivalent present after 15, 30, and 60 seconds for various aqueous phase, organic phase, and temperature states. On the basis of these data, the effect of changes in the aqueous phase, the organic phase, or the temperature was studied by comparing the behavior of the percentage of uranium equivalent at the end of each time period with a given standards. (Letter from J. L. Jaech to E. L. Burley, "Analysis of RA Column Kinetics Data," dated August 6, 1953.)

Routine computational work for the Engineering Department consisted of Group Nine Metal Studies calculations, Graphite Conductance calculations for H and D reactors, and curve fitting to exponential pile data.

Salary rating curves for professional personnel were formulated for the Design Section based upon data supplied by the Section. The computed curves were reported in chart form.

Discussion was held with the Technical Administration Unit relative to recording and controlling approved authorizations for employees.

An IBM system of control and inventory is being developed for Classified Files which will reduce the required storage space, personnel, and operating costs and provide improved document control.

27 3/4 hours were spent on forms design for the Engineering Department.

Work continued in preparation of visual aid material for the October Board of Directors Meeting. All lecture aid material requested by the Department Manager has been completed and approved. Progress continued on schedule in construction of the 105-K Process Unit and the 202-A Purex Building Display Model. Fabrication of the process features required in the Section Model of the 202-A Purex Building may be delayed as approved plans were not received in August.

A preliminary sketch of a proposed light water boiling reactor was prepared for Advanced Technology. The sketch has been approved and work will start in the near future to prepare a detailed perspective rendering of the reactor and adjoining facilities.

Routine graphics work for Pile Technology included preparation of nineteen graphs for document HW-28260 titled "Stresses in Hollow and Split Hollow Internally Cooled Slugs"; completion of revisions and additions to a number of graphs for document HW-27531 titled "Effect of Pile Irradiation on Aluminum Corrosion"; completion of three charts for document HW-28766 titled "Mole Fraction Helium"; and completion of plates for document HW-27819

Routine graphics work for Fuel Technology included completion of two charts for document HW-29075 titled "The Rejection of Slugs from 250 Tons of Rods Heat Treated at the Fuel Materials Production Center"; completion of ten graphs for document HW-28512 titled "Report on Production Test 105-515E In Pile Behavior of Anodized Slug"; and completion of one chart for document HW-28726 titled "Grain Diameter and Calculated Reactivity Loss vs. Chromium Content of Uranium."

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

As part of the study of paper work, a review has been made of the distribution of copies of purchase orders for general supplies items. By a revision of the procedure the number of copies can be reduced from 470,000 to 272,000, a reduction of 198,000 copies (42%) annually.

Discussions were had with the Purchasing and Stores Section on a proposed investigation of the problem of inventory control over stores stock. It was agreed that all related activities of the plant must be reviewed before a mechanized system of control can be suggested. (Letter, "Proposed Investigation of Controlled Inventory" to H. J. Wolte from H. Tellier, July 29, 1953.) Data resulting from an investigation of purchase orders is being analyzed statistically in order to obtain estimates of the time that should be allowed for the procurement of various types of materials.

Unit cost curves and certain other statistical analyses of Purchasing and Stores Section costs were completed, (Letter, "General Supplies and Standby Unit Costs," from L. W. Smith to H. J. Wolte).

Further procedural developments were made to the system of IBM inventory and repair records on office equipment. Gummed labels were prepared for all office machines file folders. Formulas that approximate the present pricing table for duplicating services were determined, (letter, "Duplicating Prices," from L. W. Smith to H. Tellier).

A new investigation into the occurrence of major injuries has begun. Preliminary results from the recently revised data indicate that some significant difference between periods may be found. The retroactive classification of two major injuries has affected the results of this study appreciably. A report will be issued upon completion of the study.

For the Telephone Unit a procedure is being developed for preparation of the plant telephone directory data by use of IBM equipment.

12 new IBM internal operating procedures were prepared and 4 procedures revised.

30 1/4 hours were spent on forms design for the Plant Auxiliary Operations Department.

FOR THE COMMUNITY OPERATIONS & REAL ESTATE DEPARTMENT

Technical assistance was given to the design of a new dwelling lease which will reduced the typing requirements of 7,000 leases by approximately 35%.

Several necessary revisions were made to the Electric Billing procedures. There is continuing to be a large volume of service changes due to the rental of the new housing units.

Assistance was given to the Richland Police in the elimination of the Shift Assignment Register. Necessary data will be incorporated on the Telephone Log.

3 1/4 hours were spent on forms design for the Community Operations and Real Estate Department.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

Analyses were performed on the numerical abundance of plankton in the surface cross sections of the Columbia river at 100-B, Hanford, and Richland. The significance of the difference in abundance at various distances across the river, and the increase in the numerical abundance of plankton as one moves down the river, were tested. (Letter, "Analysis of Numerical Abundance of Plankton in the Columbia River," from V. A. Clark to R. W. Coopey, dated August 31, 1953.)

Computational work has been completed on the study of the distribution of radio-active phosphorus among the algae, plankton, sediment, water, and sides (absorption) of an experimental aquarium. The distribution was found as a function of time by solving a set of differential equations similar to the familiar radioactive decay equations. The computation was carried out on the card-programmed-calculator, using the new general purpose control panels. The results obtained are now being analyzed statistically.

The distributions of various aquatic invertebrates in the Columbia River at various locations and times of the year are being analyzed in order to determine the effect of Hanford pile effluents on these species.

Statistical analyses were made of data from experiments in which the Pu deposition in various body tissues was analyzed thirty days after the therapeutic agents were administered. (Letter from D. W. Gaylor to J. Katz, dated August 1, 1953, "Experiment 5-Therapeutic Effect of Various Agents on Pu Deposition in Body Tissues of Rats.) The amounts of Pu present in body tissues of rats thirty days after Pu injection were compared with the amounts of Pu present sixty days after injection. (Letter from D. W. Gaylor to J. Katz, dated August 4, 1953, "Comparisons of Pu Deposition in Body Tissues of Rats, X-3, X-4, and X-5.")

The amounts of Pu on the skin, and absorbed by the carcass and liver, were analyzed at various time intervals up to one week after Pu application to

[redacted]

a small area of the skin of rats. (Letter from D. W. Gaylor to M. H. Weeks, "Analyses of Pu Absorption into the Body From the Skin of Contaminated and Decontaminated Rats", dated August 31, 1953.)

Estimates and confidence limits are being computed for deposition of plutonium in the body tissue of several groups of rats fed chronically on a high level plutonium solution. This is the second experiment dealing with rats chronically fed plutonium and the results of this experiment along with the first experiment, which dealt with lower dosages, should aid in the establishment of the maximum permissable concentration in drinking water.

Pu deposition in various body tissues, blood, and waste products of dogs injected with Pu and subsequently treated with various therapeutic agents at several dosage levels are being studied.

A summary was made of 1953 sheep blood data taken at 100-F Area. This work involved calculating sums and averages for each of the seven blood constituents for which records are kept. The averages were taken over thirty day intervals for each of 45 sheep groups.

Further investigation of the feasibility of using IBM equipment in the Regional Survey Sampling program has been made. At a recent meeting of the Control Unit of the Biophysics Section, the entire routine associated with the extensive sampling program in operations was discussed in an attempt to determine whether the Computing Unit can be of any assistance. (Meeting of C. E. Thompson with Z. E. Carey, H. J. Paas, D. L. Reid, and G. E. Pilcher.)

Routine computational work for the Radiological Sciences Department consisted of the reduction of June wind data, Aquatic Biology calculations, sheep thyroid and radioanalysis calculations, and weather data reduction for July.

A set of four large lecture aids were prepared for the Board of Directors Meeting in October.

A complete set of Hanford Exclusion Area maps showing principal facilities and waste systems and a perspective cutaway of the Redox Plant which will show all floor levels including passageways, stairways and operating levels is being prepared for the Radiological Records and Standards Section.

2 hours were spent on forms design for the Radiological Sciences Department.

FOR THE MEDICAL DEPARTMENT

A statistical study of employee medical visits to first aid stations has been completed and reported upon to the Medical Department. The principal aim of this study was to provide an objective means of detecting those employees who appear to be chronic visitors to first aid stations, and to determine to what extent they differ from other employees. (Report, "Medical Visits Study", by J. V. Cannon.)

A preliminary analysis was made of blood count data supplied by the Medical Department. The data represent measurements of certain blood characteristics of employees during the last nine years, with mean values calculated for men and women separately in each of the various work areas. Several statistically significant differences between these mean values were indicated, but could not be explained. A more detailed analysis is necessary to determine the underlying causes for these differences and to plan a future program.

2 1/2 hours were spent on forms design for the Medical Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

Additional services were rendered to the Salary Administration Section in the analysis of National Salary Survey data. For each company in the survey, using professional position data, curves were fitted expressing the relationship between monthly salaries and years since first degree, combining Bachelors and Masters degrees and keeping Doctors degrees separate (letter, "Professional Position Curve Fitting By Individual Companies," from L. G. Waters to R. C. Grant). Combining all companies and using professional position data, curves of best fit were developed for various spans of years since first degree. Curves of best fit were also obtained using the professional position data from the Engineering and Radiological Sciences Departments. Other analyses are continuing.

A procedural study is being conducted of reports prepared for Salary Administration. Formalized IBM operating procedures are being published on routine monthly and quarterly reports.

Preparations for the employee attitude survey that is to be conducted this fall were begun. This survey is a follow-up of the one made during 1952 by Richardson, Bellows, Henry and Company of New York City. Mailing labels were prepared by IBM to distribute the questionnaires and identify the questionnaires as to class of employee.

Assistance was given the Employee and Public Relations Department in revising their monthly employee separations charts. The revision was based on results contained in the report "Employee Separations," a statistical analysis of separation data for the year 1952. Seventy-five additional copies of this report were requested by the New York Office.

Discussion with Suggestions and Insurance led to a more economical procedure for reproducing suggestions which will eliminate the need to re-type suggestions.

Two suggestions were evaluated at the request of the Employee and Public Relations Department.

2 1/4 hours were spent on forms design for the Employee and Public Relations Department.

FOR THE FINANCIAL DEPARTMENT

Discussion of certain cost analysis problems have been held with the Manager, Accounting and other members of the Financial Department. These discussions pertained to the applications of mathematical statistics to cost analysis.

Certain procedural changes were made in exempt salary distribution to simplify the work in the Payroll Unit of proofing operations.

A proposed procedure is being developed for preparation of the exempt salary payroll on IBM equipment. The method of calculations has been developed. Suggested forms for check, earnings statement, and payroll register are scheduled for submission to the Payroll Unit for approval in September.

Included in the non-exempt payroll checks issued August 21 was payment of the retroactive earnings effective June 10.

Three special reports were prepared on employees who were transferred from DuPont to General Electric at this project on September 1, 1946. These reports were required for administration of the DuPont annuity plan.

An analysis of insurance deduction rates was made and the effect of the 6/10/53 general wage adjustment on each job and/or preferential rate was studied. Those rates which when increased would be subject to a higher insurance deduction rate were determined and listed. The differences between old and new rates were computed for the month of July adjustment and a file of new insurance deductions prepared for the following months of processing IBM payroll deductions.

A listing was prepared of employees who pledged cash contributions to the Good Neighbor Fund. This listing was prepared to provide a cash control of cash contributions.

A listing was prepared of changes of pre-coded cost codes for non-exempt employees.

A listing was prepared of non-exempt employees in the Project Section of the Engineering Department showing for each employee the new job and preferential rate resulting from the June 10 general wage increase.

A special report was prepared of dependents covered by the insurance plan.

A revision of the weekly payroll preparation procedure was made to include a machine edit of the assembled IBM cards. This edit by use of the Electronic Statistical machine will test the sequence and coding of the various cards required for payroll processing.

A cheaper method of preparing weekly time cards was proposed. (Letter from R. Iseli to C. E. Cooke, August 26, 1953.)

The monthly distribution of charges for printing and duplicating were prepared by IBM for the first time.

An IBM system of extension, application of overhead and distribution of charges of stores issues was installed.

A lecture series of nineteen large visual aids was prepared for the Board of Directors Meeting in October.

10 3/4 hours were spent on forms design for the Financial Department.

FOR THE ADMINISTRATIVE STAFF

A letter was distributed to mailing lists 1,2,3 & 4 suggesting the use of a form to be attached to unnecessary communications and returned to the originator. The initial response to this suggestion has been strong as indicated by requests for additional forms and mail room volume.

A study (HW-29043, "Statistical Study of Plutonium Nitrate Shipper-Receiver Differences" from N. D. Peterson to C. J. Shortess, Jr., dated August 14, 1953) was made of shipper receiver differences on 253 plutonium nitrate lots shipped to Los Alamos Scientific Laboratory and Dow Chemical Works. Purposes of the study were to investigate the presence of any non-randomness in these differences, to describe the nature of any non-random variation, and to obtain a quantitative estimate of the precision or random variation present, together with appropriate control limits for future use.

In a restricted letter "Statistical Study of Uranium-Specific Gravity Relationships of RCU and Their Bearing on Computational Estimation, II" from N. D. Peterson to C. B. McKee, dated August 7, 1953, revision was made of a previous study because of a change in molarity. Both investigations were intended to study the close relationship between specific gravity and uranium concentration measurements in tanks 15-1 and 15-6 of Building 221-U and were conducted in response to the suggestion that it might be possible to estimate one of the measurements computationally from the other. Formulas for use in such computation were determined and reported, along with the precisions resulting from their use.

A series of studies are in progress on errors in the measurement of UO_3 powder. Completion of a study of random sampling errors and lot variability, and of U^{235} measurements, together with an integration with previous studies, is expected in the near future. A study is in progress on the variability in plutonium over-and under-accounted for in SF material balance reports. A study is planned concerning the fluoride powder in Task II, and the magnitude of random errors that would result from using a constant factor in estimating the weight of product in the powder.

RG

[redacted]

FOR THE ATOMIC ENERGY COMMISSION

Final computations of the new releases requested by the A. E. C. are in progress.

A request has been received for a comprehensive review of the methods used in Hanford release computations. It is expected that this will be completed during October.

A request was submitted to the Graphics Unit from the AEC Manager's office to rush preparation of material for an Administrative Area (700) Office Space Study. The study included preparation of a schematic drawing of the 700 Area showing the distances between related offices. Included were photos showing crowded office conditions and make-shift office buildings.

Routine graphics work for the AEC included preparation of a set of material flow charts; plotting of current data to construction progress and cost charts; completion of a safety poster for operation of power saws; and layout and rendering of process flow charts on TBP and UO_3.

NEW DEVELOPMENTS

A considerable amount of interest is being shown at present by the area engineers in the type of reactor data calculations of which the IBM equipment is capable. The calculation of tube powers and flows, and of film coefficients has played a significant part in the continuing effort to get more product out of the reactors, and promises to play an increasingly significant role in the near future. Because of the apparent emphasis being laid on this phase of reactor operation, it was deemed justifiable to expend considerable time in development work on this project. The development work is aimed primarily at speeding up the calculating time necessary to process one set of data, thereby making the results available sooner and at a lower cost. Through the development of new control panels, it was found possible to cut the calculating time in half. This was accomplished principally through the use of rational approximations to certain functions which occur repeatedly in engineering problems in which the flow of water plays a predominant role. Another important result of this development work has been to simplify the analysis of the computed results through the use of printed pile maps. These maps are prepared on standard IBM accounting machines, and condense over two-thousand pieces of information onto a single page which can be readily scanned.

Work on the development of the SEMAC II Card-Programmed-Calculator system is completed. Like its predecessor, SEMAC I, this system is a general purpose computing system capable of performing algebraic operations on numbers in either fixed-decimal or floating-decimal representation, and providing for the conversion of numbers from one representation to the other. Experience has indicated that there is a strong preference for the floating-decimal type calculation because of the great programming ease it affords. At the same time it became apparent that floating-decimal operation, because of the many intermediate operations involved, was costly in machine time. With this in mind,

an attempt was made to speed up floating-decimal operation without sacrificing any of the flexibility and generality of the system. The attempt was successful, with the result that the new system requires no more time for floating-decimal operation than for fixed-decimal operation. In an ordinary problem, this will result in a saving of from 20 to 25 per cent running time. Other time saving features, both from the programming standpoint and from the machine standpoint, have been incorporated. The evaluation of the various transcendental functions has been speeded up, and the argument range on many of them considerably extended. Additional storage has been made available, with a lower average access time than before. At a recent meeting of IBM Card-Programmed-Calculator customers in Endicott, New York, where a representative of the Computing Unit read a paper on SEMAC I, considerable interest in the SEMAC systems developed at Hanford was evidenced. A number of firms are currently using the SEMAC I system in their computing facilities, thus indicating that the work done on these systems here has placed the reputation of the Hanford Atomic Products Operation computing facility in one of the leading positions in the country.

The development of a card-programmed-calculator differencing system is completed. In this system, cards bearing the arguments and associated functions are fed into the tabulator. The first through sixth differences of this table are calculated, printed and punched in summary cards. If higher order differences are required, these summary cards may similarly be differenced. The calculations may be done in either fixed-decimal or floating-decimal representation. This system has already been used in conjunction with the preparation of a large table of Bessel integrals; in this case it was used to find the first differences, which will be printed along with the table as an aid in linear interpolation. Other equally significant uses of the system are anticipated. The problem of table preparation with provision for higher order interpolation will be considerably simplified through the use of this system. Perhaps the most fruitful possibility for the system lies in its ability to analyze a table of calculated functions for random errors. These errors are not at all apparent from an inspection of the table itself, but will have a marked effect on the higher order differences. The system has already been used for this purpose.

SUMMARY

During the month of August, 156 statistical, procedural, computational, and graphical problems were completed, and as of August 31, a backlog of 251 problems were on hand.

Department Serviced	Percent of Services Rendered				
	Units				Statistical & Computing Section
	Statistics	Procedures	Computing	Graphics	
Manufacturing	8	4	6	13	8
Engineering	28	10	19	41	21
Plant Auxiliary Operations	3	14	0	4	2
Community Operations & Real Estate	0	1	3	0	2
Radiological Sciences	21	1	3	22	7
Medical	8	1	2	0	2
Employee and Public Relations	11	8	3	0	4
Financial	0	46	62	14	49
Administrative Staff	7	14	0	0	2
Atomic Energy Commission	14	1	2	6	3
TOTAL	100	100	100	100	100

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY — AUGUST, 1953

The number of applicants interviewed in August was 1,512, as compared with 1,397 for July. In addition, 133 new applicants applied by mail. Open, nonexempt nontechnical requisitions increased from 262 at the beginning of the month to 275 at month end. One hundred and two employees were added to the roll and 149 removed during the month. Separation rate increased from 1.01% for fiscal month of July to 1.43% for fiscal month of August. During August, 38 new requests for transfer to other type work were received by Employment and 45 transfers were effected. Attendance recognition awards were distributed to 124 employees in August, including 28 employees who qualified for three-year awards.

Four employees died during the month and three employees retired. One hundred and seventy-five visits were made to employees confined to Kadlec Hospital and 58 checks were delivered to employees confined at the Hospital or at home. At month end, participation in the Pension Plan was 96.3%, in the Insurance Plan 98.9% and the Employee Savings and Stock Bonus Plan 44.8%. At month end there were 809 registered under Selective Service and 766 military reservists were on the roll. Since August 1, 1950, 292 employees have terminated to enter military service, of which 70 have returned, 7 have not claimed reemployment rights, leaving 215 still in military-leave status.

A total of 77 new employees attended orientation meetings. Of this number, 96.1% have signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 90.9% in the Good Neighbor Fund.

Thirty-six adopted suggestions were approved for awards in August, resulting in cash awards totaling $745, with a total net savings of $6,515.29.

By month end all necessary materials for use in conducting an Attitude Survey had been received and work had commenced in the preparation of individual packets to be distributed to all employees, September 10 and 11.

To supplement recruitment for Metal Handlers urgently needed, two Employment representatives talked with personnel of the John Deere Yakima Works, which is scheduled to be closed early in 1954. Total force of this plant is about 135, and by month end 20 had indicated interest in employment with GE.

The Electric Distribution and Telephone Section utilized the GE Selection Program for Supervisors for the first time in selecting a first line foreman. Reactor Section management is also actively interested in this program and plans to make use of it in selecting supervisors.

Employee and Public Relations
Summary

The Company's revised Suggestion Plan will become effective at HAPO, September 1, 1953, which is the effective date of the revised plan throughout the Company. At HAPO all other than exempt employees will be eligible to submit suggestions through the plan, with exempt personnel not being eligible.

August 19, fourteen KAPL employees completed a six week training period here. Two Navy Medical Corpsmen completed a seven week training program in the Radiological Sciences Department on August 26.

In accordance with the program schedule for 1953 no meetings were planned for the month of August and all Training personnel have had 1953 vacations. However, Training and Development activities continued as follows: Principles and Methods of Supervision -- Enrollments for the September sessions of this supervisory skill program are complete for both the Richland and outer area groups and enrollment at Richland for the month of October is completed. Conference Leading -- At the request of the Separations Section, Manufacturing Department, this technique in leading group thinking was presented to 14 of their supervisory personnel on Friday, August 28. Stenographic-Secretarial Program -- This 4-hour program was presented on Tuesday, Wednesday and Thursday, August 4, 5 and 6, with a total attendance of 50. This concludes the present scheduling of this program; however, it will continue to be available on a request basis. The films "Telephone Courtesy" and "By Jupiter" were shown by request to 47 non-exempt members of the Reproduction Section on Tuesday, August 4. Also by request, the film "Telephone Courtesy" was shown to 18 non-exempt technical personnel on Wednesday, August 5. HOBSO II -- All Training and Development personnel will be capable of making this presentation at any time after September. Conference Rooms -- A conference room for training area personnel is being prepared at the Pistol Range and the first meeting is scheduled for that location on September 14. SAGE was distributed on August 17. Informative Meetings -- At the request of four supervisors of the Reactor Section, a member of Training met with them on Thursday, August 6, to offer assistance in conducting informative meetings with their employees. Let's Talk It Over Interviews -- Training and Development has prepared a check sheet for use of supervisors in conducting their interviews with non-exempt people. Requests for 3,865 of these forms were fulfilled during the month of August. Requests for Material -- Transcripts of program attendance were requested and returned for 169 Design Section and Plant Engineering Section personnel, and 11 Labor Law booklets were mailed to individual supervisors per telephone requests.

Promotion of the follow-up employee opinion survey scheduled for the second week in September was aided through the preparation and dissemination of information to exempt and nonexempt employees. An announcement letter from the General Manager was written and arrangements made for its delivery to exempt employees at plant address and to nonexempt employees' homes early in September. The survey instruction sheets and the supplementary questionnaires were revised and produced. Arrangements for details of the survey to be carried in the September 4 issue of the GE NEWS were made, and distributed. Collection boxes were obtained, assembled and made ready for distribution to employees' work places.

Employee and Public Relations
Summary

Promotion material to aid supervisors in conducting "Let's Talk It Over" sessions with their employees was prepared jointly by Employee Communications and Training. The "aids" included instructions on the basic techniques, a suggested sequence for holding "Let't Talk It Over" interviews, a check sheet, and broadside which describes in detail how the Company attempts to provide all of the elements of a good job in each GE job. A letter to the managers information group on the scheduling and conducting of "Let's Talk It Over" interviews with exempt employees was written for the signature of manager, Employee Relations.

Work continued on "here's hanford", a brochure being prepared for the Board of Directors visit to Hanford next month. Final copy was reviewed by the General Manager and final art work begun.

Suggestion System was featured in two separate GE NEWS issues. One featured photos of latest award winners and a news story. A syndicated story announced revisions in the Plan. Story was localized to show how revisions would affect Hanford. Story was supplemented by a full-page mat.

Promotions of employees from nonexempt status to exempt are now being publicized in the GE NEWS, in accordance with a recently adopted policy. Two such employees' promotions were publicized during the month. Purpose is to help make nonexempt employees aware that promotion opportunities do exist at Hanford.

GE Graduate School of Nuclear Engineering fall classes received a full-page treatment in the GE NEWS. Details for registration and summary of classes were highlighted.

Major organizational changes in the Manufacturing, Employee and Public Relations, and Financial Departments were given appropriate coverage during the month by the GE NEWS.

The 1953 National and West Coast salary surveys and analysis of the data were completed within Salary Administration during August. Survey reports were published and copies were sent to the Commission and to participating companies. Reimbursement authorization requests were submitted to the Commission for approval of those recommendations resulting from analysis of the survey.

A modified brochure on the Hanford Salary Plans was released to the Employee Relations Section for publication and should be ready for mailing to exempt employees during the first part of September.

Material for review of the organization directory has been received, edited, and released to Printing for publication as of September 1. This is the first publication of the directory the Salary Administration Section has prepared since the assignment of the new responsibility.

Employee and Public Relations
Summary

Appraisals for professional exempt employees were received and analyzed during the month. In conjunction with Financial, sheets were prepared for Professional Salary Review and were released to the departments.

The News Bureau produced thirty-four releases during the month. Of these, nineteen were sent to the local list, including radio stations. Two releases were distributed to Northwest daily newspapers, two went to home town or college papers of the individuals concerned in the stories, three were furnished to trade journals, and eight received special distribution.

A major project was begun during the month involving production of a large amount of editorial and picture material for use in a special edition of the TRI-CITY HERALD. It is planned by the HERALD'S publishers to have the edition distributed shortly in advance of the arrival in Richland of the Board of Directors, and it is expected that the theme of the special edition will be recognition of the growth which has taken place in the Tri-City area as a result of the continued expansion at Hanford during the time in which General Electric has been prime contractor to the Atomic Energy Commission. Pictures of the General Electric Board of Directors have been furnished the TRI-CITY HERALD for use in this special edition, as well as five previously written feature stories that have been revised to fit this special edition.

The Company's magazine for teenagers, ADVENTURES AHEAD, has notified us they will use our story on the Hanford sheep farm. The version submitted emphasizes the part played in this research work by local members of the Future Farmers of America.

The SPOKESMAN REVIEW has advised us they will use our "Tony, the Atomic Clown" feature story in an early issue of their Sunday supplement.

A change in procedure has been adopted as a means of achieving increased use of a feature story being distributed to weekly newspapers in the Northwest. All illustrations for the article will be sent out in mat form. We have been assured that weekly newspapers almost universally will use an illustration furnished them in this manner rather than in the form of glossy prints from which they must make engravings, and thus incur additional expense.

Hanford's Atomic Frontier Days offered the 75th Anniversary committee an additional opportunity to publicize this significant event in the Company's history this year. A float on the theme of the 75th Anniversary was entered in the parade, and pictures of the celebration, including the float, have been requested by the CANDID CAMERA editor for use at an early date.

Six trade and/or technical publications now have articles by Hanford authors under consideration for publication. One magazine, CHEMICAL PROCESSING, is considering five different technical papers previously prepared at Hanford for presentation at technical society meetings.

Employee and Public Relations
Summary

Another major undertaking during the month has been the preparation of material for publication in the January, 1954 issue of the GE REVIEW. The deadline for this material is September 25, and it will be necessary that all text material and photographs be submitted to Oak Ridge for an opinion review concerning declassification of the information, and all photographs must be submitted to Washington, D.C. for publication clearance.

A member of the A.E.C. Industrial Information Branch staff in Washington, D.C. spent two days at Hanford this month. During his visit, he toured Hanford, discussed our industrial information activities with a member of the Public Relations Section, and afforded us an opportunity to examine a preliminary draft of the report prepared by the working party which visited Hanford earlier.

A total of 140 photography assignments were filled during the month, producing a total of 22,332 prints. Of the total, 20,206 were "A" and "B" area identification badge prints. Seven rolls of contraband film were processed during the month for General Electric Security. Motion picture photography during the month included 900 feet of 16mm black and white for the 100-K construction movie, 100 feet for the Atomic Energy Commission construction progress movie, 700 feet for the 300 Area fabrication process movie, and 2600 feet of 16mm color film for the employee orientation movie. In addition, 1200 feet of 16mm color motion picture film was exposed of a single experiment in the Biology Section.

Although cloudy weather continued to interfere with the full-scale production planned of the employee orientation color motion picture, substantial progress was made on this project during the month. The production staff has had the advantage of a critique by members of the processing studio on the quality of color film exposed to date. Remarks from the processing studio indicate that the work completed so far is of professional quality.

Preparations are under way for completion of the first two 400-foot reels of finished film on early phases of 100-K Area construction for the Design Section. Necessary factual material for use in preparing the script has been gathered from Kaiser Engineers Construction Progress Reports, Engineering Department semi-monthly reports, plus information collected on location.

Arrangements were completed during the month for another phase of the construction progress motion picture when members of the production staff inspected fabrication facilities at the Navy Yard in Bremerton, Washington. The scenes, which will be shot there early next month, will depict the manufacture of special equipment for Hanford, shipment of the equipment, and its delivery on the Project for final installation. Bremerton Navy Yard officials were extremely helpful to the production staff in making necessary arrangements to obtain this footage.

Employee and Public Relations
Summary

Certain modifications in the Atomic Energy Commission's Directive HW-306 covering the construction progress motion picture were obtained in the form of a letter from the Commission during the month. The Commission's letter authorizes General Electric to proceed with production of this motion picture in accordance with plans outlined to the Atomic Energy Commission following initial receipt of the directive.

Work was started during the month for the Metal Preparation Section which may result in production of a classified motion picture film concerning the mechanical canning device recently installed in the 300 Area. If, after exposed film has been received from the processing studio, it is determined that production of a motion picture is feasible, a condensed version may also be produced for showing to the Board of Directors during their visit to Hanford in October.

Arrangements were made for the production of a ten-weeks series of a public health radio program to be broadcast over a Tri-City radio station in September. The series of programs will be similar to those produced in past years in that they will be a combination of interviews with local doctors on subjects of interest to the public and special transcriptions of dramatic situations occuring in the medical world.

The close alliance between the work of the Supervisor of Public Information, and the functions of the Speakers Bureau has resulted in the decision to transfer the functions of the Speakers Bureau at an early date. By placing the Speakers Bureau work with the Supervisor, Public Information, it is expected that fuller development of the publication possibilities of various papers by Hanford authors presented for clearance can be developed.

Eight papers and one abstract were received during the month for clearance. The papers are primarily concerned with technical subjects, and are for presentation or publication during the early fall months.

Several meetings were held during the month between members of the Instrument Craftsmen's Guild, Electricians, and Pipe Fitters, together with international representatives, to iron out jurisdictional problems between these crafts. The Company agreed to the Council's request of a minimum of 48 hours' notice of our intent to operate or shut down a particular facility on a holiday. Evidence continues to accumulate that White House proposals for amendments to the Taft-Hartley Act will contain significant concessions to labor. It has been indicated that the business agent for the Guards Union will surrender this position in October. A fight involving a Power and Maintenance employee and an Operations employees in the Separations Section occurred on the graveyard shift on August 15. A proposed contract in which were incorporated modifications applicable to the current HAMTC-GE Agreement was submitted to the Council in behalf of Community Firemen. The Council has requested arbitration of a grievance involving a Junior Power Operator who has been bypassed for temporary upgrades to Chief Operator.

Employee and Public Relations
Summary

Additional pressure is being applied by construction forces to secure hazard pay for work performed under certain conditions beyond the barricade. The Contractors and the Teamsters have exchanged proposals patterned essentially after the recent AGC settlement in Spokane. Differences over the form of agreement to apply to this Project continues to result in no Asbestos Workers being furnished by the union. An offer of a wage increase of 14¢ per hour has been made to the Roofers. The Building Trades Council and city and state organizations have received official notice from AFL President George Meany that their relationships with the Carpenters should be severed. It has been reported that Sign Painters have been awarded a Local charter, separate and distinct from Painters - Brush or Spray.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

AUGUST, 1953

ORGANIZATION AND PERSONNEL

General

There were no organizational changes during August.

Employee Relations

Effective July 31, 1953, J. A. Wood, Supervisor of Training, terminated.

Effective August 7, 1953, Ella W. Burton, General Clerk B, was removed from Investigations and Personnel Records Unit, because of illness.

Effective August 14, 1953, Inez McElroy, General Clerk C, terminated voluntarily from Suggestion System.

Effective August 17, Virginia J. Hammons, General Clerk D, was added to Investigations and Personnel Records Unit.

Salary Administration

Effective August 3, 1953, Elna J. Armstrong was reactivated from leave of absence.

Effective August 24, 1953, Betty D. Bear transferred from the Project Section.

Technical Personnel

Trainees - Beginning of Month 79 - End of Month 71

Net Change:	Placements in departments	7
	Resignations (military)	1
	(other)	1
	New Hires	1

Public Relations

There were no organizational changes during August.

Union Relations

Effective August 3, 1953, Elouise M. Schmidt, Stenographer, transferred from Office Unit to Wage Rates Unit.

Number of Employees on Roll	August, 1953
Beginning of Month	204
End of Month	197
Net Change	7

Employee and Public Relations

EMPLOYEE RELATIONS

Personnel Practices

Employment

	July, 1953	August, 1953
Applicants interviewed	1,397	1,512

502 of the applicants interviewed during August were individuals who applied for employment with the Company for the first time. In addition, 133 applications were received through the mail.

Open Requisitions	July, 1953	August, 1953
Exempt	0	0
Nonexempt	262	275

Of the 262 open, nonexempt, nontechnical requisitions at the beginning of the month, 152 were covered by interim commitments. Of the 275 open, nonexempt, nontechnical requisitions at month end, 176 were covered by interim commitments. During August, 98 new requisitions were received requesting the employment of 153 nonexempt, nontechnical employees.

	July, 1953	August, 1953
Employees added to the rolls	114	102
Employees removed from the rolls	113	149
NET GAIN OR LOSS	+ 1	- 47

Separation:

	Fiscal Month July, 1953		Fiscal Month August, 1953	
	Male	Female	Male	Female
Including employees who were laid off for lack of work	.66%	2.42%	.94%	3.53%
Excluding employees who were laid off for lack of work	.65%	2.42%	.94%	3.47%

Employee and Public Relations

EMPLOYEE RELATIONS

Over-all Separation:

	Fiscal Month July, 1953	Fiscal Month August, 1953
Including employees who were laid off for lack of work	1.01%	1.43%
Excluding employees who were laid off for lack of work	1.00%	1.41%

During August, 15 employees left voluntarily to accept other employment, two left to enter military service, and four left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-53	383
Number of requests for transfer received during August	38
Number interviewed in August, including promotional transfers	39
Transfers effected in August, including promotional transfers	47
Transfers effected since 1-1-53, including promotional transfers	354
Number of stenographers transferred out of steno pool in August	8
Transfer requests active at month end	299

ADDITION TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	4	70	1	75
Re-engaged	—	1	—	1
Reactivations	3	21	—	24
Transfers	2	—	—	2
TOTAL ADDITIONS	9	92	1	102

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	15	85	—	100
Removals from rolls (deactivations)	5	38	—	43
Transfers	6	—	—	6
TOTAL TERMINATIONS	26	123	—	149

Employee and Public Relations

EMPLOYEE RELATIONS

GENERAL

	7-1953	8-1953
Photographs taken	308	416
Fingerprint impressions	193	157

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	7-1953	8-1953
General Electric cases	133	80
Facility cases	31	29
TOTAL	164	109

INVESTIGATION STATISTICS

	7-1953	8-1953
Cases received during the month	158	156
Cases closed	148	316
Cases found satisfactory for employment	139	101
Cases found unsatisfactory for employment	3	3
Cases closed before investigation completed	18	24
Special investigations conducted	2	5

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6079
One-year awards made in August for those qualifying in July	45
Total two-year awards to date since January 1, 1950	1690
Two-year awards made in August for those qualifying in July	51
Total three-year awards to date	510
Three-year awards made in August for those qualifying in July	28

During August, 21 people whose continuity of service was broken while in an inactive status were so informed by letter.

By month end all necessary materials for use in conducting an Attitude Survey had been received and work had commenced in the preparation of individual packets to be distributed to all employees, September 10 and 11.

The Electric Distribution and Telephone Section utilized the GE Selection Program for Supervisors for the first time in selecting a first line foreman. Reactor Section management is also actively interested in this program and plans to make use of it in selecting supervisors.

Employee and Public Relations

EMPLOYEE RELATIONS

Two Employment representatives traveled to Yakima to obtain some production and maintenance personnel from the John Deere Plant, which is scheduled to close in March of 1954.

Arrangements were made through the Employment Security Department in Yakima, to meet with the personnel manager, in order to discuss employment needs and the personnel available at their plant. He was very agreeable and after conferring at some length about job classifications at John Deere, a meeting was arranged with about 40 of their people. The type of job openings were outlined, including general pay schedules, security, and benefit plans. The personnel manager agreed to post notices on the plant bulletin board for the benefit of those employees that were not contacted. Twenty employees had requested applications by month end. Total force of this plant is about 135.

Most of the employees at the John Deere Plant do work of a production machinist type so there may be a few that are interested in the Metal Handler openings. The plant also employs some craftsmen, clerical people, draftsmen, and a nurse, which could possibly be used at HAPO.

Supervisor Selection Program - During the month eleven supervisory candidates were tested including subjects from the following groups: Transportation Section, Metal Preparation Section and Separations Section, Power and Radiation Monitoring Units.

Clerical - The Minnesota Clerical Test was used to test 21 clerical applicants during the month.

Metal Handlers - Limited hiring was done for this classification so that it was possible to test five new employees to add to the data for that validation study.

The program for Stenographers-Secretaries was completed in August. Out of a possible 385 employees in the two classifications, a total of 329 girls attended. Acceptance of the program was very good.

Advertisements for nurses will appear in the following magazines for the next three months: American Medical Association, American Journal of Nursing, and Hospitals. Ads were run in newspapers on August 23,24,and 25 in the following cities: Denver, Salt Lake City, Seattle, Portland, Boise, and Spokane.

Employee Benefits

The following visits were made with employees during the month:

Employee contacts made at Kadlec Hospital	175
Salary checks delivered to employees at Kadlec Hospital	46
Salary checks delivered to employees at home	12

Employee and Public Relations

EMPLOYEE RELATIONS

Employee Benefits

At month end participation in Benefit Plans was as follows:

	July	August
Pension Plan	95.5%	96.3%
Insurance Plan	98.9%	98.9%
Employee Savings and Stock Bonus Plan	44.5%	44.8%

Four employees died during August, namely:

	Plant Auxiliary Operations
	Plant Auxiliary Operations
	Plant Auxiliary Operations
	Manufacturing

Twenty-eight letters were written concerning deceased employees and their families during August, regarding payment of monies from the Company and answering questions.

Since September 1, 1946, 128 life insurance claims have been paid totaling $ 791,013.00.

Three employees retired, namely:

Harrison S. Garrett	W-3880-944	Normal Retirement
George H. Beard	W-5645-616	Normal Retirement
Roy E. Morris, Sr.	W-5972-922	Optional Retirement

During August, 28 letters were written to retired employees providing them with information of general interest. To date 263 employees have retired at Hanford, of which 135 are continuing their residence in the vicinity.

Orientation of new employees was presented daily throughout the month. A total of 77 employees attended this program. Of this number, 96.1% signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 90.9% in the Good Neighbor Fund.

Organization and Policy Guide 18.14.7, "Policy On Employment of Individuals Relieved From the Armed Forces", has been revised to include recent revisions in the State of Washington Laws concerning veterans' re-employment rights and also to include other provisions of the Federal Statutes, as well as the State Statutes not previously covered in this instruction. Specifically these changes are to provide re-employment rights to (1) employees leaving to enter the Washington National Guards, (2) employees leaving to enter the United States

Employee and Public Relations

EMPLOYEE RELATIONS

Public Health Service, and (3) employees who cannot perform their former position due to a service contacted disability, but who are able to perform other types of work.

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		766
Number of reservists classified in Category A	122	
Number of reservists classified in Category B	62	
Number of reservists classified in Category C	80	
Number of reservists classified in Category D	502	
Number who returned to active duty to date		130
Number who returned to active duty in August		1
Number of reservisits for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	3	
Number of reservists classified in Category D	39	
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		809
Employees registered who are veterans		247
Employees registered who are non-veterans		562
Deferments requested to date (including renewals)		1085
Deferments granted		837
Number of employees for which deferments have been requested		221
Number of employees classified in Category B	0	
Number of employees classified in Category C	2	
Number of employees classified in Category D	219	
Deferments denied and appealed at state levels		5
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		0
Deferments denied by local board and not appealed		5
Deferments denied by state board and not appealed		24
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		87
Deferments requested, later withdrawn		78
Deferments pending		41

Employee and Public Relations

EMPLOYEE RELATIONS

Military terminations since 8-1-1950 are as follows:

Reservists recalled	128
Selective Service	159
Women employees enlisted	5
TOTAL	292

Employees returned from military service:

Reservists	55
Selective Service	15
TOTAL	70

Known number not claiming reemployment rights 7

Number of employees still in military status 215

Suggestion System, Workmen's Compensation and Liability Insurance

	July	August	Total Since 7-15-47
Suggestions Received	200	171	12138
Acknowledgements to Suggesters	195	173	
Suggestions Pending Acknowledgement	43	41	
Suggestions Referred to Departments for Investigation	195	173	
Suggestions Pending Referral to Depts.	43	41	
Investigations Completed & Suggestions Closed	274	89	
Suggestions Adopted - No Award	1	1	
Adopted Suggestions Approved by Committee for Award	91	36	
Total Net Cash Savings	$16,146.45	$6,515.29	
Total Cash Awards	$ 2,080	$ 745	
No. of Suggestions Out for Investigation	589	633	

The highest award of $150 was made to an employee in the Separations Section. His suggestion resulted in a revision of the solution heating time during the process step of cake solutions thus reducing the time cycle in the 231 Building. This suggestion resulted in considerable savings in labor.

An employee in the Reactor Section received the second highest award in the amount of $135 for his suggestion for installation of a stop on the charging machines to prevent loss of material due to damage during the charging operation. Considerable material savings were realized through adoption of this suggestion.

Employee and Public Relations

EMPLOYEE RELATIONS

Liability Insurance

-- On August 11, 1953 at about 5:05 p.m. got off the shuttle bus near the intersection of Stevens and Torbett and as he was proceeding across Stevens Drive he was struck by a government owned Buick driven by was taken to Kadlec Hospital. Dr. Fuqua gave a preliminary report that there were no fractures involved and the injuries did not appear to be serious. Dr. Corrado has since advised that except for bruises there was nothing seriously wrong with However, has complained of having difficulty with his eyes and back pain. Travelers were immediately advised of the incident and have discussed the situation with

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 71 insurance companies and investigation agencies during the month of August, 1953. 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

	July, 1953	
	Long Forms	Short Forms
Claims reported to Department of Labor and Industries	29	393

	August, 1953	
	Long Forms	Short Forms
	31	400

Total Since September, 1946 - 17,080

	July	August
Claims reported to Travelers Insurance Company	17	*9

Total Since September, 1946 - 761

* Of the claims reported to Travelers Insurance Company during the month of August three were bodily injury claims and six were property damage claims.

Training Program - Collateral Contractors

On August 19, 1953 fourteen KAPL employees completed a six week training course in reactor operation in the 100 areas. The program was completed with a one day tour through the 200 and 300 areas.

Employee and Public Relations

EMPLOYEE RELATIONS

Two Navy Medical Corpsmen completed a seven week training program in the Radiological Sciences Department on August 26.

The Company's revised Suggestion Plan will become effective at HAPO, September 1, 1953, which is the effective date of the revised plan throughout the Company. At HAPO all other than exempt employees will be eligible to submit suggestions through the plan, with exempt personnel not being eligible.

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

In accordance with the program schedule for 1953 no meetings were planned for the month of August and all Training personnel have had 1953 vacations. However, Training and Development activities continued as follows:

MANAGEMENT SKILLS:

PRINCIPLES AND METHODS OF SUPERVISION — Enrollments for the September sessions of this supervisory skill program are complete for both the Richland and outer area groups and enrollment at Richland for the month of October is completed. At present enrollments are being accepted for the month of November 1953. Another member of Training and Development is being prepared for instructing these persuasion methods and will be ready for presentation of this program by December first.

CONFERENCE LEADING — At the request of the Separations Section, Manufacturing Department, this technique in leading group thinking was presented to 14 of their supervisory personnel on Friday, August 28.

OTHER TRAINING ACTIVITIES:

SUPERVISOR'S HANDBOOK — Following is a summary of handbook distribution to date:

Number issued prior to August	- 1330
Number issued during August	- 2
Number returned during August	- 6
Number issued end of August	- 1326
Number on hand end of August	- 174
Total number of handbooks	- 1500

Of the 174 handbooks on hand 47 are not usable as they lack too many pages while 114 are ready for issuance and 13 have to be checked for completeness.

STENOGRAPHIC-SECRETARIAL PROGRAM — This 4-hour program highlights the methods, traits, techniques and personality factors which are desirable in all secretaries or stenographers in any business. The program was presented on Tuesday, Wednesday and Thursday, August 4, 5 and 6, with a total attendance of 50. This concludes the present scheduling of this program; however, it will continue to be available on a request basis.

The films "Telephone Courtesy" and "By Jupiter" which are a regular part of the Stenographic-Secretarial program, were shown to 47 non-exempt members (mixed group) of the Reproduction Section on Tuesday, August 4. This showing was at their request. Also by request, the film "Telephone Courtesy" was shown to 18 non-exempt technical personnel on Wednesday, August 5.

Employee and Public Relations
Employee Relations

HOBSO II — All Training and Development personnel will be capable of making this presentation at any time after September. Pilot groups will be made up for both area and Richland personnel, after which scheduling of the program for all exempt personnel will begin.

CONFERENCE ROOMS — Due to closing down of the Hanford High School, a conference room for training area personnel is being prepared at the Pistol Range, which is approximately three miles from the old location. Renovations are progressing satisfactorily and the first meeting is scheduled for that location on September 14.

SAGE, a one-page information media for all HAPO supervision, covers Training meeting information, human relations philosophy, hints to supervision, economics facts and current events. Another issue was distributed on August 17.

INFORMATIVE MEETINGS — At the request of four supervisors of the Reactor Section, a member of Training and Development met with them on Thursday, August 6, to offer assistance in conducting informative meetings with their employees. This is a counseling service which is available to any supervisor who requires aid in getting these supervisor-employee meetings started.

LET'S TALK IT OVER INTERVIEWS — Training and Development has prepared a check sheet for use of supervisors in conducting their interviews with non-exempt people. Use of the check sheet is entirely optional; however, its adoption has been reflected in requests for 3,865 of these forms during the month of August.

REQUESTS FOR MATERIAL — Transcripts of program attendance were requested and returned for 169 Design Section and Plant Engineering Section personnel, and 11 Labor Law booklets were mailed to individual supervisors per telephone requests. A reference list of Business English Aids has been prepared by Training and Development as a follow-up service relative to the Stenographic-Secretarial program. In addition, a qualified member of the Training and Development Unit is available (by telephone) to give advice on correct word usage, hyphenation, correct grammar, etc. Calls of this nature from stenographers and secretaries have been averaging about two per day over the past month.

MISCELLANEOUS — In August of 1951, a member of the Training and Development Unit conferred with T. A. Sherman, Associate Professor of English at the University of Idaho, relative to a course on Effective Presentation. As a result of that conference, Professor Sherman has requested permission to use a copy of Training and Development summarized monthly report in a book which he is writing, and which will go to press in September. No classified information was contained in the report and permission has been granted Professor Sherman for publication of this example report.

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Promotion of the follow up employee opinion survey scheduled for the second week in September was aided through the preparation and dissemination of information to exempt and nonexempt employees. An announcement letter from the General Manager was written and arrangements made for its delivery to exempt employees at plant addresses and to nonexempt employees' homes early in September. The survey instruction sheets and the supplementary questionnaires were revised and produced. Arrangements for details of the survey to be carried in the September 4 GE NEWS issue were made, and a letter to exempt employees from the manager, Employee Relations, was written and distributed. Collection boxes were obtained, assembled and made ready for distribution to employees' work places.

A letter from the General Manager, to mail to employees' homes along with a new Suggestion Plan booklet, was written and distribution arranged for the first week in September. In addition, a letter to management was written for the signature of the manager, Employee Relations, which will be sent early in September to exempt employees' office addresses; attached will be an advance copy of the General Manager's letter to nonexempt employees, a copy of the nonexempt employees' Suggestion Plan booklet for supervisors on the same subject.

The release of plant organization announcements and Community Operations information through the HAPO News Bureau and GE NEWS was discussed with Public Relations. It was agreed that all organization announcements would be held for release in the plant paper except when local daily newspapers requested advance information about major changes from the News Bureau. At the same time, the GE NEWS staff when receiving information about Community Operation from the organization will advise that the same information should be conveyed to the News Bureau for release.

Promotion material to aid supervisors in conducting "Let's Talk It Over" sessions with their employees was prepared jointly by Employee Communications and Training. The "aids" included instructions on the basic techniques, a suggested sequence for holding "Let's Talk It Over," interviews, a check sheet, and a broadside which describes in detail how the Company attempts to provide all of the elements of a good job in each GE job. A letter to the managers information group on the scheduling and conducting of "Let's Talk It Over" interviews with exempt employees was written for the signature of manager, Employee Relations.

A conference was held with Dr. J. B. Work to establish a working arrangement between Employee Communications and Dr. Work who will gather technical information to be included in the 1953 Hanford Annual Report. It was agreed that Dr. Work would contact representatives of each Department concerned, and would determine what subjects would be suitable to photograph from now through the end of the year. Supervision of photographic assignment will be held by Special Programs, in addition to editing technical copy matter, writing the non-technical portion of the report, and producing the final printed report.

Two Management News Bulletins were issued during the month to all exempt employees—on August 3 and 19.

Employee & Public Relations

EMPLOYEE RELATIONS

Employee Communications accepted responsibility for obtaining Training film for plant showings, in addition to the established activity of providing limited projection service for film showings. Films previously were obtained through Public Relations.

Production of a "Salary Administration" booklet, written by Dr. W. I. Patnode to replace one prepared by Special Programs, was initated. It is scheduled for distribution prior to the middle of September. The Special Programs booklet originally was approved, but finally rejected as being too complete. The much shorter revision now in production covers only major highlights of the exempt salary plans.

In line with the Special Programs functions of producing the monthly Safety Topics of the month, the editing of Lifeline material for the GE NEWS was accomplished.

Community Operations Annual Report, a four-page, two color photographic report of community progress during fiscal year 1953, has been prepared by Special Programs at the request of Community Operations Section. Photos were taken, copy written, layout designed and approved. 8,000 copies are now being produced by a Portland printer.

Safety topic for September, "As Your Own," and the health bulletin for September, "See For Yourself," were written and produced.

6,000 copies of the Nucleonics Employee Good Neighbor Fund window stickers were reprinted at the request of Benefit Plans. At the suggestion of Special Programs, a permanent symbol was designed to represent the Nucleonics Employees Good Neighbor Fund, and will be utilized on a "Fund" letterhead.

Work continued on "here's hanford," a brochure being prepared for the Board of Directors visit to Hanford next month. Final copy was reviewed by the General Manager and final art work begun.

Employee recruitment advertising written and placed by Special Programs at Employment request consisted of advertisements for: X-ray technicians, in four consecutive issues of "The American Medical Association Journal" and two consecutive issues of "Hospitals;" and for Nurses, in 12 consecutive issues of "The Journal of the American Medical Association," 3 consecutive issues of both the "American Journal of Nursing" and "Hospitals"and in eight metropolitan daily newspapers in the surrounding region.

The "General Electric's Record Management Program At Hanford Works" was reprinted at the request of Public Relations; 100 copies were produced.

1000 copies of the GE booklet "Why Study Math?," were distributed throughout the employee information racks. These booklets were obtained from the Public Relations Service Division at no charge.

"A is For Atom" movie was shown 13 times to approximately 260 people; to date, a total of 1560 employees have viewed this film. Sixteen other projection engagements were met with showings to approximately 360 people. Three films have been ordered from off-site for employee showings.

Employees & Public Relations

EMPLOYEE RELATIONS

Two security posters (100 copies each) and the weekly Elliot Service Company and Sheldon-Claire posters were put up throughout the plant. All Suggestion System boxes were serviced, and the new suggestion form installed. In addition, Labor Day holiday notices were posted.

Atomic Frontier Days celebration received major publicity in the issues of the GE NEWS immediately prior to and following the event. Publicity included pictures, program of events, stories, and full page of pictures showing highlights of the celebration. Emphasis was given to the part employees played in the three-day festival.

Suggestion System was featured in two separate GE NEWS issues. One featured photos of latest award winners and a news story. A syndicated story announced revisions in the Plan. Story was localized to show how revisions would affect Hanford. Story was supplemented by a full-page mat.

Promotion of employees from nonexempt status to exempt are now being publicized in the GE NEWS, in accordance with a recently adopted policy. Two such employees promotion were publicized during the month. Purpose is to help make nonexempt employees aware that promotion opportunities do exist at Hanford.

Children of employees were featured in pictures and story covering the opening of Wellsian Lake for juvenile fishing. A prior GE NEWS issue published a retouched photo of two junior fishermen showing their dreams of catches they hoped to make on opening day.

Outside activities of HAPO people received special attention in the GE NEWS through two full-page photo features covering a visit to Mt. Rainier by the IMAC's, and a joint venture of the Richland Camera Club and the CAP. All pictures included in the features were taken by Hanford employee members of the Camera Club and IMAC's.

Materials and equipment shipped to Hanford provided GE NEWS material demonstrating the unusal and varied requirements of the project. One of the two pictures to appear was sent to the GE NEWS by a vendor inspector in the field.

Supervisors Association objective of establishing a Credit Union at Hanford was the basis of a GE NEWS story which announced a Credit Union organizational meeting. It was emphasized that the Supervisors Association would aid in establishing other Credit Unions at Hanford if enough interest is shown.

Opening of the second annual Separations Safety Stampede was given feature treatment in one GE NEWS issue. Publicity included two cartoons and a news story.

GE Graduate School of Nuclear Engineering fall classes received a full-page treatment in the GE NEWS. Details for registration and summary of classes were highlighted.

Employee & Public Relations

EMPLOYEE RELATIONS

Major organizational changes in the Manufacturing, Employee and Public Relations, and Financial Departments were given appropriate coverage during the month by the GE NEWS.

Art work provided the GE NEWS by Employee Communications Commercial Artist included: one editorial cartoon, design and art work of a standing head for "The Trading Post" column, and photo retouching.

Cover designs, layouts, and five illustrations were produced for the September safety topic of the month and the September health bulletin.

Booklet art work during the month included: final art work and layout for Community Operation's annual report, including extensive retouching of two photos; a portion of the final art work for "here's hanford" booklet to be presented to members GE Board of Directors; and 8-page type layout and a Salary Administration booklet; and two cover layouts for a forthcoming "Manual of Radiation Protection Standards."

Rough layouts were produced for a new series of full-page GE NEWS messages being prepared by Special Programs.

Original design and final art work were developed and produced for a Good Neighbor Fund symbol and for a Good Neighbor Fund letterhead which utilized the symbol.

Employee and Public Relations

SALARY ADMINISTRATION

GENERAL

During August position evaluation continued on current resolution of problems with significant progress in the Project Section. The field review of positions by this Section in conjunction with Financial was performed in the Manufacturing Department. At month end the review of this Department was approximately half completed.

Work continued on long range organization analysis and a number of conferences were held with Department management level personnel in resolution and clarification of aspects of this problem. Short range analyses primarily consisted of working with various Sections in efforts to reduce and consolidate numbers of levels of supervision.

ANNUAL SALARY SURVEY - NATIONAL AND WEST COAST

The 1953 survey reports have been published and issued to the Commission and participating companies. The resulting salary data has been analyzed and reimbursement authorization requests have been submitted to the Commission for approval of professional funds for FY 1954, for extension of area differential to exempt professional employees on the same basis as currently applied in the E.A.&O. Salary Plan, and for approval of new E.A.&O. salary ranges. No authorizations have been issued to date. The approval of the E.A.&O. salary ranges is expected shortly; however, differences must be resolved regarding the extension of area differential and this is delaying approval of the other two requests. The Commission has been requested to submit a statement of their specific objections so that G.E. management can analyze these and take appropriate steps.

SALARY PLAN BROCHURE

A modified brochure describing Hanford salary plans has been approved for publication and was released to the Employee Relations Section during August. These should be ready for mailing to exempt employees early in September.

PROFESSIONAL SALARY REVIEW

During August, appraisals of exempt professional employees were received by Salary Administration and were analyzed for conformance to the standard distribution pattern. In conjunction with Financial, professional review sheets were prepared and submitted for salary review of these employees. Department managers were advised of available professional funds. The approval of the Department recommendations will depend upon the expected approval of the reimbursement authorization request to the Commission for professional funds for FY 1954.

ORGANIZATION DIRECTORY

Organization charts and lists were submitted by Departments for preparation of the organization directory revision effective September 1. This material has been edited and submitted to Printing for publication. This is the first publication of the directory by the Salary Administration Section since the recent assignment of this responsibility.

RECONCILIATION OF HANFORD SALARY LEVELS INTO COMPANY STRUCTURE

During August, material was prepared and arrangements were made with representatives of the Aircraft Gas Turbine Division so that meetings could be held in September, and that further reconciliation could be made in an effort to identify Hanford positions within the levels of the overall General Electric Company salary plans. This meeting will be held with members of this Section at Richland.

Employee and Public Relations
Technical Personnel Section

TECHNICAL RECRUITING

Based on personnel ceilings recently established, we are asking each Section to estimate for us additions contemplated through FY-1954:

(a) Experienced technical personnel
(b) Technical graduates to be transferred from Rotational Training Program

and to indicate whether these estimates include replacement of anticipated losses. The results will be used to guide our further canvassing for experienced people and our authorization requests for hiring from the colleges.

To meet the few currently listed needs for technical personnel we are dealing with a number of specialized sources including other AEC sites. Two offers to highly capable Ph.D. engineers have been made during this month, with one acceptance to date. One Ph.D. chemical engineer, hired earlier, reported for work.

Approximately forty office interviews have been conducted with technical personnel who dropped in uninvited. Although hiring very seldom results from such interviews, this is a goodwill activity we must maintain.

Plans for university recruiting, already tentatively established with Schenectady, will be further confirmed during the September 1 visit at Hanford by W. S. Hill, Head of the Company's Technical Recruiting. We now have at Richland about forty members of various Departments who have had reasonable experience as recruiters. We will endeavor to get the assistance of the ablest members of this group toward obtaining best results in our limited recruiting coverage during FY-1954.

TECHNICAL PERSONNEL TRANSFERS AND LOSSES

Resignations	18	(incl. late July, not prev. shown)
Transfers to Other Divisions	2	
Transfers within HAPO	1	

It is becoming more difficult to find appropriate transfers within the Hanford Operation or throughout the Company. A number of employees of average rating have been advised to consider very carefully the advisability of keeping their present jobs, and a few have been advised to look outside the Company in their own interests.

Employee and Public Relations
Technical Personnel Section

EDUCATION

Announcements of an extensive graduate-level program will be ready for distribution by the end of August, and phone requests are already being received. The college-level program has been expanded to represent a better opportunity for laboratory assistants, technicians, cost clerks, and others who wish to broaden their qualifications by study.

ROTATIONAL TRAINING PROGRAMS

The Company's Rotational Training and Education Programs for technicians and laboratory assistants, as conducted in eastern plants, have been carefully reviewed. A preliminary proposal for adapting such training to the Hanford Atomic Products Operation has been prepared. This has been reviewed with the Employee Relations Section, the Union Relations Section, the Department Manager, and the Education Committee. The preliminary response is sufficiently favorable to warrant continued work to develop a more detailed proposal, and this is being undertaken. Such a program should be beneficial in permitting better utilization of technical personnel and also in providing better opportunities for semi-technical personnel as they develop their individual qualifications.

The Rotational Training Program for technical graduates numbers 71 Hanford trainees including about forty graduates of June, 1952, or earlier. Every effort is being made to place these men promptly and we believe the establishment of personnel ceilings will help the customer departments toward determining the numbers of these men they can utilize. Further recommendations for hiring to replenish this program will await the current survey mentioned earlier in this report.

During July and August we have again had eight college juniors who will soon be returning to their universities, as well as three additional juniors for the account of the ANP Project. All of these men appear to have very favorable impressions of the Hanford activity and personnel. We believe that this summer employment will again be justified as an aid in the coming recruiting and in university relations, generally.

MISCELLANEOUS

Since the last report, the writer has visited Dr. K. B. McEachron, Consultant on Professional Employee Relations, to learn how we can benefit by working closely with him. Dr. McEachron hopes to visit Richland this fall.

MISCELLANEOUS (Cont'd)

During a brief visit with Mr. T. M. Linville, it was learned that his studies on training for management will soon be issued. Mr. Linville has also expressed willingness to visit Richland, subject to invitation and arrangement through proper channels.

Conversations have also been held with Mr. Frank T. Lewis of the Manufacturing Services Division, Schenectady. With the endorsement of our Manager of Manufacturing, Mr. Lewis has been invited to visit Richland to observe similarities and differences between our manufacturing problems and those of the eastern plants. From his coming visit, we hope to judge better whether the Company's training program for manufacturing has any significant relationship to manufacturing duties at Hanford.

A proposal on studies towards management work, prepared earlier, is being reviewed with a few selected individuals to see whether they would devote substantial effort to the proposed studies.

Employee and Public Relations

PUBLIC RELATIONS

During the month of August, the News Bureau issued 34 releases. The breakdown by category, distribution, and content was as follows:

Plant or Company		Distribution	
Administration and Law	8	Local	19
Plant Services	5	Daily	2
Pay and Benefits	5	Home or College	3
Employment Services	5	Trade Journal	3
Education	1	Other Special	8
Technology and Science	1		
Richland	8		
Goodwill	1		
Total	34		

Content	
Information only	7
Short news story	20
Long news story	4
Feature length	3

Work was started to provide the TRI-CITY HERALD with a large amount of feature and picture material for a special edition to come out at about the time the Board of Directors meets here in October. They have been furnished with pictures of the members of the Board and 5 previously written feature stories revised to fit this special use. Meetings have been held with Herald staff members to reach an understanding on what material they want and when.

The job of bringing a biography file up-to-date is approximately half done. Ultimately, this file will include write-ups on about 60 key G.E. people.

ADVENTURES AHEAD has notified us they will use our Hanford Sheep Farm story. The version submitted was one which had been revised to emphasize the part played in this research work by local members of the Future Farmers of America.

The SPOKESMAN REVIEW has advised us they will use our "Tony the Atomic Clown" story in an early issue of their Sunday supplement.

One feature story prepared during the month concerned an employee who is a long-time resident of nearby Prosser, Washington. It was sent to the Prosser paper with later distribution scheduled to the Yakima Morning HERALD. This is the first of a series of such articles planned for distribution to newspapers in the Yakima Valley as a means of counteracting some of the anti-Hanford project feeling found still to exist in that area.

As a means of achieving increased use of a feature story concerning Hanford's experimental farm operation in weekly newspapers in the Northwest, all illustrations for the article will be sent out in mat form. This new procedure has been adopted because of the assurance we have that weekly newspapers almost universally will use an illustration if furnished to them in this form, rather than in the form of glossy prints fromwhich they must make engravings and, thus, incur additional operating expense.

Employee and Public Relations

A float on the theme of the 75th Anniversary was entered in the Atomic Frontier Days parade as a noncompetitive entry. Plans were made to take this float to several other Southeastern Washington celebrations, but it was finally determined that it would not be possible to take Government equipment away from the Project for this use.

The Community NEWSLETTER was written and distributed during the month.

The following articles were submitted to trade and technical publications during the month:

Subject	Magazine
Five different technical papers	CHEMICAL PROCESSING
"Inert Gas Shielded Tungsten Arc Welding of Stainless Steel Piping and Tubing"	INDUSTRY AND WELDING
Air Conditioning and Ventilating at Hanford	HEATING, PIPING AND AIR CONDITIONING
"Electronic Computing--an Engineering Tool"	CHEMICAL ENGINEERING PROGRESS
Photographs for "Welding Teflon to Teflon"	MATERIALS AND METHODS
Health Education at Hanford	PUBLIC HEALTH REPORTS

Photographs and text material are being accumulated for an article that will summarize technical and scientific accomplishments at Hanford during 1953. This article will be published in the January 1954 issue of the GE REVIEW. Hanford's text and photographs will be submitted to Oak Ridge for an opinion review concerning declassification of the information, and all photographs will be submitted to Washington, D.C. for security clearance. The deadline for the article is September 25.

A member of the AEC Industrial Information Branch staff in Washington, D.C., spent two days at Hanford this month. While here, he was given the same tour taken by the Working Party from the AEC's Advisory Committee on Industrial Information when they visited Hanford earlier. He also was furnished a summary account of our industrial information activities by a member of the Public Relations Section. His visit afforded us an opportunity to examine the preliminary draft of the Working Party's report in which they reveal a considerable interest on the part of the various visiting editors in information about accomplishments at Hanford they would like to see prepared for public release.

A total of 140 photography assignments were covered during the month of August, 1953, and a total of 22,332 prints were produced, of which 20,206 were "A" and "B" badge prints. A total of 2,126 prints were area and news work. Seven rolls of contraband film also were processed for GE Security.

Motion picture film exposed during the month on four individual motion pictures was as follows: 900 feet, 16mm (B&W) for 100-K Construction Project; 100 feet 16mm (B&W) for AEC; 700 feet, 16mm (B&W) for 300 area and 2,600 feet, 16mm (color) for Orientation.

Twelve hundred feet of 16mm color motion picture film was exposed of the vivisection of sheep for Biology Section of Radiological Sciences Department.

Employee and Public Relations

Production on"Here's Hanford," the 16mm color motion picture on Orientation subjects being produced for Employee Relations Section continued this month with the completion of over half of the exterior sequences. Over 200 feet of originally exposed film has been processed and returned with a critique on the quality of the color and composition made by a responsible reviewer at the off-site studio. It has been indicated that, so far, our work has been of professional quality. Exterior sequences include footage on Hanford, Richland, North Richland, the Perimeter Barricade, and supplementary footage on Atomic Frontier Days. During the last week of the month inclement weather prevented concentrated filming.

Production of the motion picture footage for Design Section and the Atomic Energy Commission on the current Expansion Program continued this month. The 105-KW building was barricaded during the month which necessitates a careful review of all subject matter filmed in that location to determine security classification. Preparations are underway for producing two 400-foot reels of finished film on early construction phases of 100-K Area for Design Section. A compilation of facts has been made from Kaiser Engineers Construction Progress Reports, Engineering Department Manager's Semi-Monthly reports from the Project Section, plus information collected on location for narration adaptation.

Members of the motion picture production staff made an inspection and survey of special process equipment being manufactured by the Navy shipbuilders at Bremerton, Washington. This was necessary to determine lighting requirements,description of the assembly of equipment and other details needed for filming this important sequence of the 100-K Expansion Program motion picture production early in September. The scenes will depict the manufacture of this special equipment, shipment, delivery en-route, arrival on the Project and final installation. Both Lieut. H. E. Weber, Security Officer, and S. L. Allison, Chief Engineer of the Navy Yard, were extremely cooperative in assisting with arrangements for obtaining this footage.

The recently completed documentary-training motion picutre, "105-C Graphite," was shown at the General Manager's regular Operating Staff meeting during the month. This picture, which was produced by Public Relations Section for Engineering Department, is being exceptionally well received in various plant groups. The complimentary comments being received are most gratifying to the production staff who made the film.

A conference was held with the Department Manager, Section Manager and officials of the Atomic Energy Commission concerning certain modifications requested of Directive #HW-306 on motion picture footage for the Atomic Energy Commission. As a result formal notice was received from the Atomic Energy Commission that they interposed no objection to possible price increases for processing footage, charging time of personnel and approved procurement of camera.

All data and proper nomenclature concerning the production and processing of motion pictures by a film studio off-site was submitted to the Contract Unit, Engineering Department. This information is in conjunction with the preparation of an invitation bid being prepared on two motion picture productions, one of which is for the Atomic Energy Commission on Directive HW-306. It is expected that bids will be opened about September 14.

Employee and Public Relations

Public Relations Section has been authorized by Metal Preparations Sub-Section to proceed with the processing of secret motion picture film made on the mechanical canning device recently installed in the 300 Area. Upon receipt of the workprint it will be determined whether a feature-length training-documentary and recruitment film can be produced. Estimates will be furnished to the requesting section when details have been explored. If such a motion picture is determined to be feasible, a condensed version may be completed for showing to the Directors of the Company during their forthcoming visit to Hanford Atomic Products Operation.

Complete file books have now been prepared on each film production to serve as reference on all activities that occur on each film presently in production. Each book includes the original proposal and approval, equipment purchased, correspondence, film received, footage notes, original story and narration script.

A special "sneak-preview" was held of the finished motion picture "Getting the Job Done," which was produced by Public Relations for Minor Construction. Officials of that Section attended the showing along with the Manager of Employee Relations and his staff. They are very satisfied with the production. The film, however, did not appear up to our standards and will not be released until an intensive study being made by the production studio has been completed.

Over 2700 Hanford Atomic Products Operation personnel have seen the training-documentary film "Radiation Hazards Control" produced by Public Relations for Manufacturing Department last year. The film has been used on a regularly scheduled training basis since its completion. In addition, this film is being used for training at Knolls Atomic Power Laboratory in Schenectady and at the Aircraft Nuclear Propulsion project at Evendale, Ohio. It is currently being considered for purchase by the Atomic Energy Commission for other installations.

Arrangements were made for the production of a ten-weeks series of a Public Health radio program to be broadcast over a Tri-City radio station in September. It is to consist of recorded interviews with local doctors on subjects of interest to the public along with special transcriptions of dramatic situations occurring in the medical world.

Effective August 1, all film distribution services were transferred to Special Programs, Employee Information Unit. This function is mainly concerned with securing films for showings to plant groups.

Arrangements were completed and carried out, as a community service, for necessary work and public address equipment supplied for the use of the Junior Chamber of Commerce during Atomic Frontier Days.

Of considerable significance was the notification received from the Atomic Energy Commission that the paper "Principles and Philosophy of Reactor Control Circuits" by I.M.A. Garcia, had been approved for presentation at Berkeley, California. This entailed special declassification processes. Appropriate publicity has been requested for this feature.

Employee and Public Relations

Preliminary plans were laid for transfer of the Speaker's Bureau activities to the Supervisor of Public Information. This change of operation will provide several advantages in assistance that can be given to authors on items for presentation that have potential value for purposes of publication. It is expected that the change will be effective about October 1.

Eight papers and one abstract were received this month for clearance:

1. "Further Studies on the Action of Growth-Inhibiting Levels of Tritium Oxide on Chlorella Pyrenoidosa," by John W. Porter, for presentation before the American Institute of Biological Sciences meeting, Madison, Wisconsin, September 8, 1953.

2. "Phycological Notes on the Columbia River in Relation to the Hanford Atomic Products Operation" by C. C. Palmiter, for presentation at the Phycological Society of America meeting, University of Wisconsin, Madison, Wisconsin, September 8, 1953.

3. "Some Design Criteria for Chemical Facilities Processing Radioactive Materials" by O. C. Schroeder for publication in "Nucleonics." This paper was previously cleared for presentation at the 1953 Conference on Nuclear Engineering, Berkeley, California, September 9, 1953, and requested for publication by "Nucleonics". Some minor changes were necessary before publication.

4. "Stirring Hot Liquids Safely", by Avic C. Forsyth, for publication at a later date.

5. "Absorption of Plutonium Fed Chronically to Rats - I. Fraction Deposited in Skeleton and Soft Tissues Following Oral Administration of Solutions of Very Low Mass Concentration" by Joseph C. Katz, H. E. Kornberg and H. M. Parker, for publication in the "American Journal of Roentenology, Radium Therapy and Nuclear Medicine."

6. "A High-Pressure Cloud Chamber Investigation of Protons Scattered by 300-Mev. Neutrons" by John DePangher, for presentation at the American Physical Society, September 2-5, 1953, Alburquerque, New Mexico.

7. "A Note on the Mechanisms of Turbulent Mixing," by Glenn R. Hilst of Argonne National Laboratory (formerly of Hanford Atomic Products Operation) for publication in the "Journal of Meteorology" at a later date.

8. "Dose Calculations for Radium and Other Isotopes" by H. M. Parker for publication as a handbook prepared by Yearbook Publishers, Inc.

Abstract:

1. "Biological Effects of Cooling Water from Hanford Reactors," by R. F. Foster, H. M. Parker and H. A. Kornberg for a paper for presentation at the Radiological Society of North America, Chicago, Illinois, December 13-16, 1953.

See attached statistical report for Hanford Photography Unit work during August.

PHOTOGRAPHY UNIT MONTH OF AUGUST, 1955	2" X 2"	2" X 4"	5" X 7"	8" X 10"	4" X 5"	11" X 14"	8½" X 11"	N E G	16mm Color M.P.	35mm Color Slides	3¼"X4" (B&W) Slides	4"X5" Ekta-chrome
COMMUNITY OPERATIONS & REAL ESTATE DEPT.					25							
Management		136	35	21	74			180				
Police				37				6				
Village Maintenance												
EMPLOYEE & PUBLIC RELATIONS	835							167				
Employment		40	12	260				24				
News Bureau			3	66				56				
Special Programs		30	26	80	8	3		132				
G. E. News												
ENGINEERING DEPT.				88								
Minor Project				23	25		18	3				14
Design					85							
Technical				12				3				
Rotational Training				40								
Technical Information				41	4		288	16				
Pile Technology				6	28							
Fuel Technology			2					9		12	4	
MEDICAL - Public Health												
MANUFACTURING DEPT.					276			46				
Plant Engineers				51				16				
Separations Section				36				12				
Power & Maintenance												
RADIOLOGICAL SCIENCE DEPT.												
Biology			15	22				29	1,200'	6	9	
PLANT AUXILIARY OPERATIONS DEPT.												
Security	9,486	9,830		50	12			708				
Electrical Distribution				7				7				
Purchasing & Stores				8				4				
Statistics & Computing				21				7				
700, 1100 Administration Area				10				7				
MISCELLANEOUS												
A.E.C. Safety				75	27			55				
A.E.C. Security	55							11				
TOTAL:	10,376	10,036	93	954	564	3	306	1,498	1,200'	18	13	14

	JUNE	JULY	AUGUST
Total Assignments	199	150	140
Total Negatives	1,371	1,375	1,498
Total Prints	20,391	16,937	22,332

Employee and Public Relations

Union Relations

UNION RELATIONS - OPERATIONS PERSONNEL

Several meetings were held during the month between members of the Instrument Craftsmen's Guild, Electricians, and Pipe Fitters, together with international representatives, to iron out jurisdictional problems between these crafts. The Guild has apparently elected new officers who they feel will represent them more satisfactorily in this fight to retain jurisdictional rights. A jurisdictional understanding was arrived at by the ICG and the Pipe Fitters, which is currently being reviewed by our field supervision to determine its effect on Operations. Additional meetings on this subject are in progress between the ICG and Electricians.

The Columbia Basin News featured an article in its issue of August 14 in which it was alleged that the HAMTC was studying the possibility of a wage demand to offset the impending rent increase, scheduled to become effective on October 1, 1953. D. E. Williams, Business Agent for the HAMTC, denied on August 17 any responsibility for the news article and stated that the Council recognizes that the HAMTC-GE Agreement is closed on the subject of wages until June 10, 1954, and that they have no intention of seeking ways of circumventing the Agreement.

In view of two grievances in the past 6 months (one of which is scheduled for arbitration) alleging insufficient or indefinite notice of the Company's intent to operate or shut down a particular facility on a holiday, the Council has requested that the Company agree to a minimum of 48 hours' notice of our intent in this regard. The prospect of such a requirement has met with no opposition from the field and we have expressed our agreement in principle to the Council.

Evidence continues to accumulate that White House proposals for amendments to the Taft-Hartley Act will contain significant concessions to labor. The information is leaking out in such an unofficial manner as to give rise to speculation that the Administration is seeking an easy out for disavowing the amendments in the event the reaction is too hostile. In any event, the information apparently represents the views of the White House staff and is interpreted by industry as a sellout to the AFL. We probably can expect an all-out campaign on the part of employers to prevent anything approaching such proposals being submitted to Congress.

It has been indicated that the business agent for the Guards Union will surrender this position in October. The move appears to be the result of some internal problems, monetary and otherwise, and indications are that officers of that union will handle the duties of business agent during their off hours.

A fight involving a Power and Maintenance employee and an Operations employee in the Separations Section occurred on the graveyard shift on August 15. For their participation in the incident, one employee was discharged for cause and the other given 6 working days off without pay. This action caused the usual repercussions, specifically an appeal by the discharged employee for reinstatement, but the Company's decision was not altered. The situation was unique in

that the union did not protest the Company's action. Some consideration is being given to tempering the disciplinary measure which management applies to "fighting on the job" cases. Any change in policy, of course, must reckon with past practice, as well as maintaining a firm control over the conduct of employees on this score.

A proposed contract in which were incorporated modifications applicable to the current HAMTC-GE Agreement was submitted to the Council in behalf of Community Firemen on August 3, 1953. The Council has been advised that it is not the Company's intent to enter into any negotiations on this proposed contract, but if the Firemen are desirous of obtaining the same general benefits that are provided in our other union contracts, that we will be agreeable to executing such a contract which will supersede the one presently in effect. No word has been received from the Council on this matter.

The Council has requested arbitration of a grievance, answered at Step II on August 6, involving a Junior Power Operator who has been bypassed for temporary upgrades to Chief Operator because of the lack of necessary qualifications and characteristics to fulfill the responsibilities of the job. This office has asked the Council to indicate where, in their opinion, the Agreement has been violated and to define the issues which they consider arbitrable.

Annually, the question arises as to whether the Company wants to reimburse those employees who participate in the various baseball tournaments throughout this section of the country. About a dozen employees are affected at this time. A consensus is that such absences could probably be excused but without pay. To make payment for an absence reason of this type would open an avenue of unlimited demand from other employees or organizations.

Grievance Statistics:

Four meetings were held during the month for the purpose of processing grievances at the Step II level.

Status of Grievances

	1953	
	Unit	Nonunit
Received this month	23	4
Received this year	210	23
Settled at Step I this month	9	1
Settled at Step I this year	97	17
Pending settlement at Step I at end of month	2	4
Settled at Step II this month	6	2
Settled at Step II this year	85	5
Pending settlement at Step II at end of month	214*	2
Brought to arbitration during the month	1	0
Pending settlement by arbitration	9**	0
Total number pending settlement	225	6

*Includes 145 bargaining unit grievances brought to Step II by the Union prior to January 1, 1953, but not scheduled for Step II processing by the Union to date.

**Includes 7 grievances brought to the arbitration level by the Union prior to January 1, 1953, but no further action has been taken by the Union to date.

Analysis of Grievances Received this Month

Department	Unit	Nonunit
Manufacturing Department		
Reactor Section	11	0
Separations Section	6	0
Metal Preparations Section	2	0
Total for Department	19	0
Plant Auxiliary Operations Department		
Transportation Section	3	0
Total for Department	3	0
Community Operations & Real Estate Department		
Real Estate Maintenance Section	1	0
Total for Department	1	0
Radiological Sciences Department		
Records and Standards Section	0	2
Biology Section	0	1
Total For Department	0	3
Engineering Department		
Project Section	0	1
Total	0	1
Employee and Public Relations Department	0	0
Financial Department	0	0
Medical Department	0	0
Legal Department	0	0
GRAND TOTAL	23	4

Employee and Public Relations

Subjects Covered by Grievances

Unit		Nonunit	
Jurisdiction	10	Hours of Work	1
Health-Safety-Sanitation	2	Working Conditions	2
Overtime Rates	1	Wage Rates	1
Sick Leave	3		
Seniority	1		
Wage Rates	4		
Subjects not covered by Contract	1		
Hours of Work	1		
Total	23	Total	4

CONSTRUCTION LIAISON

Additional pressure is being applied by construction forces to secure hazard pay for work performed under certain conditions beyond the barricade. The Sheet Metal Workers met on August 10, 12, and 13, with the Conciliation Service who was called in to mediate the dispute on this subject when the union threatened to strike if their demand was not met. Results of the conferences were reported favorable, however, since the union agreed to take back to its membership a modified proposal in which no reference was made to hazard pay.

The Plumbers and Fitters also endeavored to capitalize on this point as a result of the following resolution which was adopted May 16, 1953, at the Washington State Convention of the United Association in Spokane:

> "Resolution Number 1 - Resolved the rate equivalent to 1½ times the regular straight time rate be established for such hazardous occupation and be it further resolved that any member performing hazardous work must be paid the applicable premium rate for minimum of two hours and be it further resolved that any member required to wear a mask of any type in these radioactive, contaminated areas be paid the premium rate of 1½ times the regular straight time rate."

The Joint State Board of Negotiators and/or Arbitrators met in Seattle on August 7, 1953, and took the following action on the resolution:

> "It was moved, seconded, and carried that the Board concur in the U.A. resolution. Following amendment to the resolution in effect that where any employee is required to wear protective clothing required by A.E.C. Government regulations or employer, he shall be paid the premium rate of 1½ times the regular straight time rate."

The Commission has notified both the local union and the Contractor (Minor Construction) that such a premium will not be paid. The matter has been referred to AEC, Washington. It is our understanding that Urban of Urban, Smyth, and Warren has violently objected before the State Board of Negotiators to the inclusion of hazard pay or onerous pay in construction contracts. What effect his objections will have on ultimate demands remains to be seen.

Employee and Public Relations

The Contractors and the Teamsters have exchanged proposals patterned essentially after the recent AGC settlement in Spokane, viz: (1) round off present rates to nearest 5¢, plus 15¢ effective July 1, 1953; and (2) a health and welfare plan involving an employer contribution of 7½¢ per hour, effective July 1, 1954. Discussions center around the time-worn and unsuccessful demands for double time on overtime work, increase in foreman differential, and working rules peculiar to this Project.

Differences over the form of agreement to apply to this Project continues to result in no Asbestos Workers being furnished by the union. The AEC appears to be doing most of the negotiating in this regard, both locally and at the Washington level.

An offer of a wage increase of 14¢ per hour, which conforms to the Yakima settlement, has been made to the Roofers. No particular difficulties appear to be present in these negotiations.

John Dunlop met with the Machinists and Millwrights on August 3, 4, and 5, in an effort to arrive at a formula that will decrease the jurisdictional strife between these two crafts insofar as work assignments are concerned in the 2101 Building. Commitments were received from both unions that work would proceed without interruption pending the outcome of a meeting between Dunlop and the international presidents of the crafts affected. The situation is status quo at month end.

The Building Trades Council and city and state organizations have received official notice from AFL President George Meany that their relationships with the Carpenters should be severed. It is expected that there will be little, if any, movement to toss the Carpenters out of local AFL organizations, largely because the Carpenters have been part of the Building Trades for a long time and may receive considerable sympathy at the local level. The consensus is that this situation is a battle among the generals and that the rift will be patched up before too long.

It has been reported that Sign Painters have been awarded a Local charter and that they will soon be regarded as a Local, separate and distinct from Painters - Brush or Spray. There are relatively few Sign Painters in the Tri-City Area, probably not over twenty in all.

WAGE RATES

A request was submitted to the Atomic Energy Commission to revise Reimbursement Authorization No. 207 to include coverage for the classification of Supervisor-in-Training.

Approval was requested and received from AEC to revise Reimbursement Authorizations 204 and 205 by the insertion of the word "interval" in the reimbursement provision allowing us to supply lunches at specific intervals of time to employees under specific conditions.

Employees and Public Relations

A letter was received from AEC signifying approval of our request to revise the Metal Preparations Section changeover rules to include a provision covering rates to be paid metal handlers who are transferred to and upgraded in the reactor station.

A request was submitted to AEC to further revise Reimbursement Authorization No. 203 to establish specific rates in connection with the special treatment accorded individuals on the roll on June 1, 1953, who are subsequently upgraded in the Metal Preparations Section.

A request for reimbursement was submitted to AEC in connection with the transfer of Community Firemen to the Safety and Fire Protection Unit of the Plant Auxiliary Operations Department. Under this proposed authority, a Community Fireman would be transferred between seniority groups and his rate would be set in accordance with the time he had been classified as a Community Fireman or his location on the monthly progression schedule.

A report on an investigation of unpleasant or onerous work conditions was prepared. This study revealed that progress is being made in eliminating disagreeable job working conditions of the three regular full-time jobs mentioned as being onerous. This investigation revealed that improvements have been effected in removing one job from the category of onerous; a new building which will incorporate design changes is expected to eliminate the unpleasant working conditions surrounding the second job, and personnel of three separate departments are making engineering and health studies in an attempt to alleviate the third problem.

A series of meetings with the HAMTC representatives was held to discuss the merger of the craft helper and craft trainee classifications. Under this proposed plan, the classification of helper would be eliminated, and trainees hired at the present helper's starting rate would progress automatically for 45 months until the job rate of this Grade 17 classification was reached.

The calculation and reposting of all wage rate records to reflect the June 10, 1953, revision in nonexempt base rates and the application of the 12 per cent "adder" factor was completed.

Three hundred twenty-four (324) automatic increases and eight (8) merit increases were processed during August. Requisitions for one hundred fifty-four (154) prospective employees and Additions to the Payroll for sixty-five (65) new employees were approved. Review for proper classification, rate, etc., was made for eighteen (18) reactivations, ninety-one (91) reclassifications, one hundred seventy-two (172) temporary reclassifications, eighty-one (81) transfers and two (2) transfers from the exempt roll.

COMMUNITY OPERATIONS AND
REAL ESTATE DEPARTMENT
MONTHLY REPORT SUMMARY
AUGUST, 1953

ORGANIZATION AND PERSONNEL

Number of employees on rolls:	SUFFIX	BEG. OF MONTH	END OF MON
General Administration	310	4	4
Community Operations Section			
Administration	340	3	2
Engineering	341	9	9
Public Works General & Utilities	342	29	31
Public Works Labor Crews	343	56	53
Recreation & Civic Affairs	344	5.5	5.5
Library	345	11	10
Fire	346	66	66
Police	347	51	51
Electrical System	348	21	20
Sub Totals		251.5	247.5
Community Real Estate Section			
Administration	350	3	3
Housing Rental	351	23	23
Maintenance	353	166	162
Commercial Property	357	12	12
Sub Totals		204	200
Civil Defense Program	360	1	1
GRAND TOTALS		460.5	452.5

Net decrease of eight in the number of employees in the department during the month of August, 1953.

GENERAL

There were two new wells placed in operation on the Domestic Water System on August 5 and August 6, respectively. The A-J recharge basin was scarified and the 5,000,000 gallon reservoir was placed on the line on Tuesday, August 25. The sprinkling restrictions were removed on August 15, and the domestic water system is now operating as designed.

There was a fire at Cahoon Motors which represented an estimated property loss of $15,000.

On August 26 we were notified by the American Automobile Association that Richland tied with Springfield Township, Pennsylvania for the third place award in the Pedestrian Safety Contest sponsored by the A.A.A. for 1952. We were in competition with 451 cities in the 10,000 to 25,000 population group.

A three-year old boy drowned in the southern extreme of the irrigation canal, about 300 feet south of Sanford Street east of Thayer Drive, on August 28.

One lessee of a Government-owned commercial building terminated its lease.

Eight new sublessees of privately-owned commercial buildings opened for business.

One new sublessee of a Government-owned building opened for business.

One sublessee of a Government-owned commercial building terminated its lease.

The two lease awards to Paul R. Lewis for the construction of service stations in the Light Industrial Area were rescinded.

Total housing applications pending, 465.

COMMUNITY OPERATIONS SECTION

SUMMARY

AUGUST 1953

ORGANIZATION & PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
ELECTRICAL	4	17	5	15
PUBLIC WORKS	12	73	12	72
RECREATION & CIVIC AFFAIRS	3	2 1/2	3	2 1/2
LIBRARY	4	7	3	7
POLICE	18	33	18	33
FIRE	66	0	66	0
ENGINEERING	6	3	6	3
	113	135 1/2	113	132 1/2

There were two new wells placed in operation on the Domestic Water System on August 5 and August 6, respectively. The A-J recharge basin was scarified and the 5,000,000 gallon reservoir was placed on the line on Tuesday, August 25. The sprinkling restrictions were removed on August 15, and the domestic water system is now operating as designed.

There was a fire at Cahoon Motors which represented an estimated property loss of $15,000.

On August 26 we were notified by the American Automobile Association that Richland tied with Springfield Township, Pennsylvania for the third place award in the Pedestrian Safety Contest sponsored by the A.A.A. for 1952. We were in competition with 451 cities in the 10,000 to 25,000 population group.

A three-year old boy drowned in the southern extreme of the irrigation canal about 300 feet south of Sanford Street east of Thayer Drive on August 28.

RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
AUGUST 1953

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees beginning of month	4	17
Transfers in	1	2
Transfers out	0	2
Terminations	0	2
Total end of month	5	15

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	3
Anchors set and guys installed	2
Street lights repaired and steel mast arms installed	1
Street lights relamped - Mercury Vapor	4
Street lights relamped - 6000L and 4000L, 1100 Area	81
Street lights relamped - 6000L and 4000L, 700 Area	14
Flood lights relamped, 1100 Area	4
Flood lights relamped, 700 Area	0
Stack lights relamped, 700 Area	2
Primary line footage added	30
Primary line footage removed	150
Transformer KVA added	25
Transformer KVA removed	5
Net transformer KVA installed	20
New services installed - residential	0
New services installed - commercial	5
Temporary services installed and removed	3
Scheduled outages - primary	3
Scheduled outages - secondary	6
Unscheduled outages - primary	2
Unscheduled outages - secondary	0
Standby and escort	2
High voltage tree trimming	104
Low voltage tree trimming	11

TRAFFIC SIGNALS

Relamping	12
Operational failures	3
Installations	0
Removals	0
Routine maintenance checks	34
Routine check R.R. signal at Van Giesen	4
Total signals in operation - automatic	16
Total signals in operation - manual	3

RICHLAND ELECTRICAL UNIT

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	15
Electrical motors checked and serviced - water	36
Electrical motors checked and serviced - sewage	24

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	6
Outside circuit checks	4
Inside faults repaired	0
Outside faults repaired	2
New circuits placed in operation	2
New boxes placed in operation	13

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	4
" " " " " " - BB1S2	4
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	12

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Voltage and load checks	4
Meters tested - customers' requests	2
New meters shop tested	7
Faulty meters replaced	4
Damaged meters and covers	8
Residential read-ins	275
Residential disconnects	1
Residential reconnects	0
Residential read-outs	115

Note: Consumption and revenue reports, under IBM operation, are not available until the 18th of following month.

Consumption and revenue:

	No. of Meters	KWH	Revenue
Schedule 1 - Residential	6297	3,635,152	$41,151.17
Schedule 2 - Commercial			
Class 1 - (In lease)	70	714,446	6,649.83
Class 2 - (Pay on meter basis)	155	352,712	4,459.55
Class 3 - (Plant Adm.) Comm. Rate	-		
700 Area		369,000	2,334.00
Kadlec Hospital		71,100	586.30
Public Health		3,034	33.26
1131 Bus Terminal		56,400	635.00
Central Stores		57,120	550.60
Stores Excess & Salv.		26,100	414.50

RICHLAND ELECTRICAL UNIT

	No. of Meters	KWH	Revenue
.005 Rate	4		
Army Dike 1 & 2		5,920	29.60
1125 Whse. Area		10,000	50.00
AEC Airport		15,000	75.00
Medical-Dental Bldg.		12,060	60.30
Library		7,200	36.00
Central Fire Station		5,460	27.30
Community Adm.		809,617	4,048.09
Total		6,150,321	$61,140.50

CALL OUTS

Call out reported as N. Richland Well Field, developed to be building burned down at park area nearby in N. Richland, and as the transformer secondaries were burned down, and no one available to cut them free, our man was properly cleared and cared for the trouble temporarily as a public service. (On W.O. C-0031). 8-4-53.

Well "E", N. Richland Well Field lost primary fuse in wind storm, two men. 8-15-53.

Series RO Circuit #500 relay and photo-cell damaged by lightning, three men. 8-8-53.

Lateral 150 amp fuse 41-X-98 at Symons and Sanford, lost primary fuse due to lightning, two men. 8-16-53.

Series RO Circuit #1400 lost circuit due to photo-cell tube failure - put circuit on manual operation until replacement was made following day, one man. 8-16-53.

Series street and fence RO circuits - lightning blew fuse to photo-cell and control circuit. Placed on manual until following day, two men. 8-20-53.

Necessary switching and grounding to permit electrical contractor to tie in 7200 volt extension for wells, three men. 8-2-53.

UNUSUAL INCIDENTS

Twelve street light luminaires were broken by rock throwing vandals in two parts of Richland, at a cost of $240.00. The Richland Police was alerted to the incidents and locations. Not all the damage was replaced at once due to lack of materials in Stores.

The tenant at 1305 Cedar, excavating for fence posts on the property line, punctured underground low voltage run to two street lights. The damage was repaired and action started to publicize the necessity of contacting the Electrical Unit before like excavations are made.

COMMENTS

Secondary distribution circuits were revised in six residential locations to replace bare wire in trees with weatherproof wire, where trimming the trees was not practical. Secondary bus wiring was installed to serve new Cannon-Joseph Building in Uptown Area north of Western Auto.

RICHLAND ELECTRICAL UNIT

Telephone cable was rearranged and extended in 700 Area to serve Building 744.

Outage to small portion of Building 760 to permit electrical contractor to make underground connection from building to transformer station. The outage permission and 2½ hours overtime was with the concurrence of Mr. Peterson, in charge of the 700 Area.

Outage was scheduled to the N. Richland well field on Sunday, 8-2-53, for three hour period to permit connection of 7200 volt extensions and transformers installed by the electrical contractor. The overtime and outage time was requested by Mr. Hooton of AEC.

At the request of Electrical Distribution Unit, our forces performing necessary switching and installation of 69 Kv fuses to care for emergency outage 8-19-53, when area forces could not be reached.

Removed unused warning light from front of old fire house on Goethals as requested by Fire Department.

Extensive tree trimming has become necessary throughout Richland from all aerial lines, due to unregulated tree planting, and watering during the present heat wave. The tree problem has become acute where planting has been done underneath and adjacent to 7200 volt lines and require cutting back three times yearly at great expense to the utility and constant contact with the tenants. The new areas are becoming infested with the wrong kind of trees and in the same difficult locations.

New connection to K-1 Area was made to provide construction power to the contractor. The connection was fused to protect Line 44, and the operating responsibility rests with Guthr Construction Co. until accepted by the operating contractor.

Fire alarm circuit trouble continues to occur at Chief Joseph School. Action has been started to induce school system to make permanent repair.

Fire alarm boxes in M-1 Area and K-4 Area were tested and put in service.

Annual checks were made on height of all traffic signals.

New two circuit panel was installed and connected to permit expansion of system.

Tests and checks were made to fire alarm equipment after recent electric storms.

COMMUNITY OPERATIONS AND REAL ESTATE
PUBLIC WORKS UNIT
August 31, 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	12	73
Transfers Out	--	3
Transfers In	--	3
New Employees	--	2
Terminations	--	3
Total End of Month	12	72

SANITATION

Waste material collected from residences, business houses, and industrial sites in Richland, and disposed of at the sanitary fill during August had a total weight of 1260 tons. The elimination of all Saturday collection services which had caused some minor inconveniences when first placed in effect, has proved to be practical and the five-day schedule will be continued. The problems have been worked out through paying special attention on Friday afternoon and Monday morning to those facilities which generate a large amount of trash.

ROADS AND STREETS

The 300 block on Craighill Avenue has presented a drainage problem for some time due to inadequate grade and a low trapped area in the center of the block. This situation was corrected during August by establishing a new grade and relaying the street pavement, gutters, and sidewalk to this grade. Approximately 350 lineal feet of the block was entirely re-worked.

The pavement on Goethals Drive from Van Giesen to Stevens has been very rough due to closely spaced longitudinal riffles in the asphalt, and this condition was corrected by laying a black-top pad over the affected area, thus filling in and leveling the surface.

An open drainage ditch running south from the intersection of Abbott and Atkins, to the shelterbelt which drains the area in the immediate vicinity of Abbott and Atkins, has required considerable maintenance occasioned by choking up with weed and plant growth. Approximately 120 lineal feet of 6" pipe has been placed in the ditch and the Housing Unit is filling the ditch to the grade of the adjacent house lots.

ROADS AND STREETS (Continued)

Improvement of the shoulder and gutter on the north side of Duportail from Thayer to Wright is now in process. The work involves removal of unstable blow sand, and laying in of 3/4 minus aggregate.

A barricade was placed across the end of the old road that led to the former location of the "Bailey" bridge across the Yakima River, to preclude the possibility of a car driving into the river during poor visibility.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks was continued.

PARKS AND PUBLIC GROUNDS

As recommended by the Park Board, permanent bulletin boards posting park regulations have been installed at Riverside Park and Columbia Playfield.

A project has been approved which authorizes the installation of a fireplace in the shelter on the east side of the Columbia Playfield field house. The material has arrived and installation will be made during September.

A satisfactory stand of grass has been established on the former location of the swimming pool at Riverside Park, and the reclaimed area is gradually blending in with the remainder of the Park.

Termination of temporary summer-time employees has commenced and personnel will be down to winter-time levels by 9-25-53.

Irrigation of lawn grass, which has been done on graveyard shift all summer, will be scheduled on day shift as necessary after 9-11-53.

Routine seasonal maintenance of park buildings, equipment and grounds; shelterbelt plantings; public areas, and other lawn areas assigned to the care of this group, was continued.

DOMESTIC WATER

Average daily water consumption for August was 20.89 million gallons. Peak day consumption was 24.595 million gallons on August 5, 1953.

Installation of pumping units was completed sufficiently to put wells 3000 L and 3000 J in service on August 5 and 6 respectively. These wells have been either in service or available for service since that date.

Because the underground water table and rate of water percolation both dropped considerably at the 3000 Area well field, supply water

DOMESTIC WATER (Continued)

was shut off to the percolation basin on August 7 to allow the area to dry for inspection and to facilitate corrective action. Inspection revealed that a silt layer of about 1/4" average thickness had covered both sides of the basin and that the sealing action of the silt was apparently more severe in the north half of the basin. The surface silt that hardened to a crust when dry, was broken up in the north basin by use of a tractor and disk and in the south basin by a motor patrol with scarifier teeth. Supply water was returned to the basin on August 13 and the rate of percolation has been very high. Also, the underground water table has raised considerably since that date.

The 5 million gallon high level storage reservoir has opened up and has been continuously on the system since August 24.

On August 27, number 13 well was taken out of service for repair.

Progress on the well equipping contract is progressing on schedule. Pumps have been set and pump houses constructed at wells 3000 F, H, J, and L. Electrical service is progressing as scheduled. Pipe work is held up for material.

Production and consumption records for August are as follow:

DOMESTIC WATER

	Well Production Million Gallons	Average Daily Production	Total Consumption Million Gallons	Average Da. Consumption
Richland	209.7356	6.7657	513.0436	16.5498
North Richland	285.1860	9.1995	82.7926	2.6707
Columbia Field	150.3766	4.8509		
300 Area			51.7754	1.6702
	645.2982	20.8161	647.6116	20.8907

SEWERAGE

Approximately 90 thousand gallons of processed sludge was pumped to the drying beds during the month.

Number 2 recirculating pump at #2 sewage treatment plant was taken out of service and dismantled for repairs to shaft bearings. Number 1 underflow pump at #2 sewage treatment plant was taken out of service and is being dismantled for inspection of shaft bearings.

Normal operations and maintenance were continued and flow meter readings at the treatment plants for August are as follow:

1205131

Community Operations - Public Works Unit

SEWERAGE (Continued)

SEWAGE

	Total Flow Million Gallons	Average Daily Flow Million Gallons
Plant No. 1	38.260	1.234
Plant No. 2	77.558	2.502
Total	115.818	3.736

IRRIGATION SYSTEM

The main irrigation canal from Horn Rapids Dam to Weedles Spill was treated with aquatic weed killer on August 19.

Routine seasonal operation and maintenance of the canals and irrigation pressure systems were continued.

The first drowning in a Richland irrigation canal since the establishment of this area as a federal reservation occurred on Friday 8-28-53 when a 33 month old boy perished in the canal east of Thayer Drive and south of Sanford extended.

1206132

RECREATION AND CIVIC AFFAIRS UNIT

MONTHLY REPORT

AUGUST, 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	2-1/2
New Hires	0	0
Terminations	0	0
Transfers - IN	0	0
- OUT	0	0
	3	2-1/2

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of August 31, 1953:-

Administration	7
Principals & Supervisors	14
Clerical	23
Teachers	0
Health Audiometer	0
Cooks	0
Bus Drivers	0
Maintenance	20
Operations	36
	100

CLUBS AND ORGANIZATIONS

As of August 31, 1953, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council - Chest	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 Monthly Report Continued)

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business and Professional Organizations		23
Churches and Church Organizations		27
Civic Organizations		19
Schools		10
Fraternal Organizations		25
Political Organizations		5
Recreation and Social Clubs	- Alumni	3
	- Arts, Music, Theater	11
	- Bridge	3
	- Dance	5
	- Garden	3
	- Hobby	9
	- Social	11
	- Sports	19
Veteran and Military Organizations		14
Welfare Groups		7
Youth - Boy Scouts		20
- Girl Scouts		49
- Campfire Girls		36
- Miscellaneous		15
		314

RECREATION

Wellsian Lake was opened for juvenile fishermen on Sunday, August 9, 1953. Only a fair amount of bass and bluegill were caught due mainly to muddy water caused by the infiltration of carp into the Lake. Approximately 750 boys and girls fished on opening day.

Approximately 30,000 persons attended various events sponsored by the Junior Chamber of Commerce during Atomic Frontier Days held on August 7, 8, & 9, 1953.

A preliminary meeting was held with the Show Chairman of the American Institute of Chemical Engineers who will sponsor a Vendors' Show at the Community House on October 6-7, 1953.

The summer recreation program came to a close at Riverside Park, Community House, and Columbia Playfield on August 28, 1953.

The Richland Parks and Recreation Board, in their meeting dated August 6, 1953, recommended that kitchen space at the Community House be considered primarily for fine art types of activity and should be scheduled in line with normal Community House policies.

(Recreation and Civic Affairs Unit Monthly Report Continued)

Attendance for the Month of August, 1953 was as follows:-

COMMUNITY HOUSE

	No. of Sessions	Youth	Adults	Sub-total
I. Sponsored Programs				
Games Room Activities	25	1982	269	2251
*Craft	25	700	156	856
II. Special Events				
Atomic Frontier Days Hobby Show	2	1000	2000	3000
III. Permit Groups				
Hi Spot	6	1292	15	1307
Rec-A-Teers	4		975	975
Richland Light Opera	2	6	122	128
IV. Other	31		639	639
Sub-Totals	95	4980	4176	9156

PARKS AND PLAYGROUNDS

RIVERSIDE PARK

I. Sponsored Programs				
Tumbling	4	4		4
Story Hour	3	78	19	97
Band Concert	1		300	300
Wading Pool	20	1269	211	1480
II. Special Events				
A.F.D.	3	11500	10000	21500
III. Permit Groups				
Richland Softball Assoc. - City Tourney	6	320	2135	2455
" " " - District "	7	450	2550	3000
IV. General Recreation Activities	31	9628	7222	16850
Sub-Totals	68	23249	22437	45686

COLUMBIA PLAYFIELD

I. Sponsored Programs				
Triple "O" League	2	103	272	375
Play-For-Fun League	4	274	137	411
II. Special Events	-	-	-	-

(Recreation and Civic Affairs Unit Monthly Report Continued)

(Columbia Playfield Continued)	No. of Sessions	Youth	Adults	Sub-Total
III. Permit Groups				
Lakeshore League	2	42	110	152
Sword & Mask	1		2	2
International Folk Dancers	1		43	43
IV. General Recreation Activities	31	2286	2363	4649
Sub-Totals	41	2705	2927	5632
OTHER				
Wellsian Lake	23	2415	560	2975
Neighborhood Playgrounds	321	16461	2976	19437
Burlin Camp	8	73	182	255
Softball-Baseball Bookings	13		165	165
Sub-Totals	376	18949	3883	22832

SUMMARY OF STATISTICS

	No. of Sessions	Youth	Adults	Total
Community House	95	4980	4176	9156
Parks and Playgrounds	485	44903	29247	74150
Total Attendance - August, 1953	580	49883	33423	83306

Grand Total For August 83,306

FY Grand Total-To-Date 149,351

* - Includes attendance for July and August

RICHLAND PUBLIC LIBRARY

AUGUST 1953

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees - Beginning of Month	4	7
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	1	0
End of Month	3	7

GENERAL

Circulation

Books	16,277	(Adult - 9,667; Juvenile - 6,610)
Magazines	392	
Pamphlets	30	
Records	1,171	
Interlibrary Loans	39	
Grand Total	17,909	

Current Book Stock

Books added this month	333	
Books withdrawn this month	12	
Grand Total	26,651	

Registration

Adult	199	
Juvenile	65	
Total	264	
Total Registered Borrowers	13,782	

Children's Story Hour Attendance 109 (5 Story Hours)

Fifty-six children have finished their required reading to qualify for their summer reading certificates in the Children's World Flight Summer Reading Club. It is anticipated that fifteen or twenty more children will finish by September 5.

Sixteen meetings were held in North Hall this month.

RICHLAND POLICE DEPARTMENT

AUGUST 1953

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	18	33
Transfers In	0	1
Transfers Out	0	0
New Hires	0	0
Terminations	0	1
Total - End of Month	18	33

GENERAL

On August 26 we were notified by the American Automobile Association that Richland tied with Springfield Township, Pennsylvania, for the third place award in the Pedestrian Safety Contest sponsored by the A.A.A. for 1952. We were in competition with 451 cities in the 10,000 to 25,000 population group. Richland received 87% of the total possible credit. We had no pedestrian deaths, and injuries were reduced from five in 1950 and six in 1951 to two in 1952.

A new property room located in the Jail has been completed and will be used to store prisoners' property. This room was constructed in one of the women's cells. Containers, properly labeled, will be used for placing personal effects of prisoners while in our custody.

New maps are being printed, outlining the open hunting areas on the Hanford Project for the 1953 hunting season.

We were assisted by Military Police officers detailed from Camp Hanford, in handling and expediting traffic during the recent Atomic Frontiers Days Celebration. They also assisted in controlling traffic before and after the parade.

Forty-two new metal visors were received and installed on our automatic traffic signal lights during the month. These metal shades were installed to eliminate or reduce sun glare reflections on the lights facing the west.

TRAINING

There was no Range activity during the month of August.

TRAFFIC	1953 July	1953 August	1952 July	1952 August	1953 Total to Date	1952 Total Same Period
Reportable accidents	12	17	18	11	162	179
Property damage accidents	12	12	15	9	137	153
Injury accidents	0	5	3	2	24	25
Total persons injured	0	5	4	2	31	32
Fatal accidents	0	0	0	0	1	1
Accidents-Daylight hours	11	13	16	8	113	114
Darkness	1	4	2	3	49	64
Accidents-Business district	5	6	9	3	62	59
Residential "	7	9	6	7	78	98
Other "	0	2	3	1	22	22
Accidents investigated	4	14	13	9	105	127
Criminal complaints filed	4	9	8	7	83	95
Violations contributing to accidents:						
Negligent driving	0	0	0	3	19	28
Fail.to yield r.o.w.	3	8	6	4	59	53
Following too closely	4	2	3	1	27	21
Drunk driving	0	2	0	0	5	2
Pedestrian violation	0	0	0	0	3	0
Inattention to driving	0	1	0	0	2	8
Reckless driving	0	0	0	0	4	7
Speeding	0	2	0	0	3	1
Unsafe speed	1	0	1	0	8	33
Improper backing	0	0	0	0	10	10
Disregard. stop sign	0	0	4	0	5	7
Hit and run	0	0	0	0	1	1
Improper passing	1	0	0	0	3	4
Improper turn	1	0	2	1	3	5
Failure to signal	0	0	0	0	0	1
Wide right turn	0	0	0	0	0	1
Wrong side of road	1	0	1	0	1	1
Asleep at wheel	0	1	0	0	1	0
Bicycle violation	0	1	0	0	1	0
Turn.from wrong lane	0	0	0	2	0	2
Traffic safety meetings	9	22	16	5	75	96
Attendance, saf. films	355	1550	785	325	5470	5850
North Richland:						
Reportable accidents	7	4			66	
Property damage	5	4			54	
Injury accidents	2	0			12	

Richland	1953 July	1953 Aug.	1953 Ave.Per Accid. July	1953 Ave.Per Accid. Aug.	1952 Ave.Per Accid. July	1952 Ave.Per Accid. Aug.
Accident prop. damage	$2,450.00	$5,175.00	$204.17	$304.41	$268.16	$241.44

ACTIVITIES AND SERVICES

	July 1953		August 1953	
	Richland	No.Richland	Richland	No.Richland
Bank escorts and details	3	4	5	4
Bicycles impounded	15	2	15	8
Bicycle violations, other	4	0	2	3
Bicycles registered	17	9	69	12
Children lost or found	11	4	16	0
Complaints invest. (no enf.action)	31	1	45	5
Deaths reported	1	0	1	0
Dog, cat, loose stock complaints	12	0	3	0
Dogs, cats, reported lost or found	5	0	6	0
Doors,windows found open in facil.	34	40	43	31
Emergency messages delivered	6	97	12	83
Fires investigated	4	2	6	6
Guns registered	2	0	21	0
Law enforcement agencies assisted	3	0	7	0
Letters of inquiry	75	0	66	0
Miscellaneous escorts	7	2	6	3
Persons injured by dogs	4	0	1	0
Plant departments assisted	18	1	21	1
Prisoners processed through Jail	29	13	18	30
Private individuals assisted	20	0	44	0
Property lost or found	22	0	40	0
Records inquiries	82	0	94	0
Reports processed through Records	327	102	296	154
Street lights out rep. to Elect.	113	25	86	30
Total	845	302	923	370

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
AUGUST 1953

OFFENSES	KNOWN Rich.	KNOWN No. Rich.	UNFOUNDED Rich.	UNFOUNDED No. Rich.	CLEARED OTHER * Rich.	CLEARED OTHER * No. Rich.	CLEARED ARREST Rich.	CLEARED ARREST No. Rich.
PART I								
1. Murder								
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break. &Entry	2	-	-	-	1	-	-	-
6. Larceny Over $50.00	3	2	-	1	1	-	-	-
Under $50.00	11	3	-	-	1	1	1	-
7. Auto Theft	1	3	1	1	-	2	-	-
TOTAL PART I CASES	17	8	1	2	3	3	1	-
PART II								
8. Other Assaults	2	2	-	-	2	-	-	2
9. Forgery & Counterfeit	1	-	-	-	-	-	-	-
10. Embezzlement & Fraud	4	1	-	-	-	-	2	-
11. Stolen Prop: Buy: Rec.	-	-	-	-	-	-	-	-
12. Weapons: Carry: Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	1	-	1	-	-	-	-	-
15 Offenses Ag. Fam. & Child	-	-	-	-	-	-	-	-
Narcotics-Drug Laws	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	9	7	-	-	-	-	9	7
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	-	-	-	-	-	-	-	-
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intox.	6	8	-	-	-	-	6	8
23. Viol. Rd. & Dr. Laws								
Fail. to Stop U Identify	2	1	-	-	-	-	1	-
Speeding	33	26	-	-	-	-	33	26
Stop Sign	27	17	-	-	-	-	27	17
Reckless Driving	1	1	-	-	-	-	1	1
Right of Way	6	3	-	-	-	-	6	3
Negligent Driving	12	11	-	-	2	-	10	11
Defective Equipment	2	6	-	-	-	4	2	2
Illegal Passing	1	1	-	-	-	-	1	1
24. Parking	30	89	-	-	7	75	23	14
25. All Other Traffic Viol.	13	13	-	-	-	2	13	11
26. All Other Offenses:								
Malicious Mischief	5	-	-	-	3	-	-	-
Vandalism	7	2	-	-	2	-	-	-
Disturbance	3	2	-	-	3	2	-	-
Bike Violations	15	8	-	-	15	8	-	-
Dest. of Personal Prop.	1	1	-	-	-	1	-	-
Investigation	2	1	-	-	2	-	-	-
Family Disturbance	2	-	-	-	2	-	-	-
TOTALS	185	200	1	-	38	92	134	103

Carried forward to page LF-5

	OFFENSES	KNOWN Rich.	KNOWN No. Rich.	UNFOUNDED Rich.	UNFOUNDED No. Rich.	CLEARED OTHER * Rich.	CLEARED OTHER * No. Rich.	CLEARED ARREST Rich.	CLEARED ARREST No. Rich.
	Totals brought forward from page LF-4	185	200	1	-	38	92	134	103
26.	All other Offenses:								
	Public Nuisance	1	1	-	-	-	-	1	1
	Prowler	2	1	1	-	-	-	-	-
	Neighborhood Trouble	1	-	-	-	1	-	-	-
	Illeg. Use of Guns	1	-	-	-	1	-	-	-
	Pickup for Outside Agency	-	2	-	-	-	2	-	-
	Juvenile Delinquency	1	-	-	-	-	-	1	-
	Shoplifting	1	-	-	-	1	-	-	-
	Arson	-	1	-	-	-	1	-	-
27.	Suspicion	-	2	-	-	-	1	-	-
TOTAL PART II		191	206	2	-	41	95	136	104
PART III									
28.	Missing Persons	1	1	-	-	1	-	-	1
	Lost Persons	13	-	-	-	13	-	-	-
	Lost Animals	5	-	-	-	2	-	-	-
	Lost Property	43	-	-	-	26	-	-	-
29.	Found Persons	-	-	-	-	-	-	-	-
	Found Animals	-	-	-	-	-	-	-	-
	Found Property	19	2	-	-	12	-	-	-
TOTAL PART III		81	3	-	-	54	-	-	1
PART IV									
30.	Fat.M.V.Tr. Acc.								
31.	Pers.Inj.M.V.Tra.Acc.	5	-						
32.	Prop.Dam.M.V.Acc.	12	4						
33.	Other Traffic Acc.								
34.	Public Accident)								
35.	Home Accidents)	No Accurate Statistics Kept							
36.	Occupational Acc.)								
37.	Firearms Accidents								
38.	Dog Bites	1	-						
39.	Suicides								
40.	Suicide Attempts								
41.	Sud.Death.&Bod. Found	1							
42.	Sick Cared For								
43.	Mental Cases	1							
TOTAL PART IV		20	4						
COMPOSITE TOTALS									
PART I,II,III,IV CASES		309	221	3	2	98	98	137	105

*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: orders from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column only in that there was no arrest.

Property reported stolen	Richland	$3,096.10
Property reported stolen	No. Rich.	$6,252.00
Property recovered	Richland	$2,579.10
Property recovered	No. Rich.	$6,092.00

1266144

MONTHLY REPORT — RICHLAND POLICE DEPARTMENT — JUVENILES INVOLVED — AUGUST 1953

OFFENSE	No. CASES	JUVENILES	SEX	5	6	7	10	11	12	13	14	15	16	17
RICHLAND														
Malicious Mischief	3	6	M		1		1		1					3
Juvenile Delinquents	1	2	M										1	1
Larceny	2	3	M					2	1					
Breaking & Entering	1	2	M						1	1				
Illegal Shooting	1	2	M							1				1
Disturbance 2	2	4	M						1			2	2	
		1	F											
Vandalism	1	3	M	2		1								
Nuisance	1	4	M						1	2	1			
TOTALS	12	27		2	1	1	1	2	5	4	1	2	3	5
NORTH RICHLAND														
Shoplifting	1	3	M				1		2					
Arson	1	3	M				1		2					
TOTALS	2	6					2		4					

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore. & Calif. Six Months (July-Dec. 1952)	One Month Average	1952 July - Dec.	1953 July	1953 August
Murder .440	.073	-	-	-
Robbery 11.850	1.995	2	-	-
Agg. Assault 10.5	1.75	-	-	-
Burglary 69.95	11.658	8	2	2
Larceny 206.7	34.45	111	18	14
Auto Theft 38.65	6.44	9	-	1

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural districts.

State of Washington Six Months (July-Dec. 1952)	One Month Average	1952 July - Dec.	1953 July	1953 August
Murder .228	.038	-	-	-
Robbery 8.28	1.38	2	-	-
Agg. Assault 2.68	.447	-	-	-
Burglary 61.4	10.23	8	2	2
Larceny 199.25	33.208	111	18	14
Auto Theft 35.6	5.933	9	-	1

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Year of 1952	Richland 1952 July - Dec.	Richland 1953 July	1953 August
Robbery 59.0	-	-	-
Burglary 74.1	8%	50%	50%
Larceny 57.4	24%	17%	7%
Auto Theft 80.4	8%	-	-

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF NORTH RICHLAND)

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

	Wash.Ore. & Calif. Six Months (July-Dec. 1952)	One Month Average	1952 July - Dec.	1953 July	1953 August
Murder	.176	.029	-	-	-
Robbery	4.74	.790	-	-	-
Agg. Assault	4.20	.700	-	-	-
Burglary	27.98	4.663	2	2	-
Larceny	82.69	13.782	24	6	5
Auto Theft	15.46	2.577	2	2	3

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural districts.

	State of Washington Six Months (July-Dec. 1952)	One Month Average	1952 July - Dec.	1953 July	1953 August
Murder	.091	.015	-	-	-
Robbery	3.31	.552	-	-	-
Agg. Assault	1.07	.178	-	-	-
Burglary	24.56	4.093	2	2	-
Larceny	79.70	13.283	24	6	5
Auto Theft	14.24	2.373	2	2	3

...e percentage of offenses committed by persons under the age of 25 years is shown:

	National Average Percentage of Cases Year of 1952	No. Richland 1952 Oct. - Dec.	No. Richland 1953 July	1953 August
Robbery	59.0	-	-	-
Burglary	74.1	-	-	-
Larceny	57.4	8%	17%	20%
Auto Theft	80.4	33%	-	-

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower age group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
AUGUST 1953

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
DEFECTIVE EQUIPMENT	2	2										$	$ 12.50	$ 5.00
DRIVERS LICENSE	26	10	6	8	2					9	16	30.00	7.50	7.50
DRVG WHILE LIC. SUSP.	1			1										
DRUNKEN DRIVING	7	5		2					7	2			230.00	
EXCESSIVE NOISE	1	1											7.50	7.50
F.T.OBEY POSTED SIGN	1	1									1			
F.T.S. & I.	1		1									50.00		
F.T.Y.R.O.W.	3	1	1	1								15.00	7.50	
FOLLOWING TO CLOSELY	1		1								1			
ILLEGAL PARKING	5		4	1						2		14.00		
ILLEGAL PASSING	2	2									1		7.50	
ILLEGAL REVERSE TURN	2	2											10.00	10.00
ILLEGAL "U" TURN	1	1											7.50	
IMPROPER PLATES	2	1			1					2			7.50	7.50
NEGLIGENT DRIVING	15	9	3	2	1					5		77.50	221.50	
NO REGISTRATION	7		2	4	1					4	4			
PERMIT UNLIC. OPER. TO OPER. VEH.	3		2	1								17.50		
RECKLESS DRIVING	3			2	1					1				
SPEEDING	41	15	18	8						7		162.50	135.00	
STOP SIGN	25	6	11	8							3	50.00	32.50	5.00
DISORDERLY CONDUCT	1		1								1			
LARCENY BY CHECK	1				1					1				
PETIT LARCENY	1			1										
PUBLIC INTOXICATION	12	2	10							1		150.00	25.00	10.00
PUBLIC NUISANCE	2		2									27.50		
RESISTING OFFICER	1	1								1			25.00	
TOTAL	167	59	62	39	7				7	35	27	$594.00	$736.50	$52.50

THREE RECKLESS DRIVING CASES AMENDED TO NEGLIGENT DRIVING.

8-1-53 21

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
AUGUST 1953

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
AID & ABET. DRKN DR.	1	1										$	$ 12.50	$
DEFECTIVE EQUIPMENT	2	1		1						1	1			
DRUNKEN DRIVING	6	5		1					5				262.50	40.00
DRIVERS LICENSE	16	3	8	4	1					4	7	32.50	17.50	17.50
F.T. GIVE ARM SIGNAL	1		1								1			
F.T.Y.R.O.W.	2		1	1									15.00	
ILLEGAL PARKING	5			5										
ILLEGAL PASSING	1		1									7.50		
ILLEGAL REVERSE TURN	1		1									7.50		
ILL. USE OF 1 WAY ST.	2		1	1								7.50		
IMPROPER PLATES	2	2								2	1		10.00	10.00
NEGLIGENT DRIVING	10	3	3	4						1		75.00	55.00	
NO REGISTRATION	6	2	3	1						3	5			
SPEEDING	21	8	10	2	1							112.50	57.50	
STOP SIGN	18	3	10	3	2					6	1	47.50	10.00	
PUBLIC INTOXICATION	11	4	7									112.50	50.00	
PUBLIC NUISANCE	1		1									12.50		
THIRD DEG. ASSAULT	1	1					1							
TOTAL	107	33	47	23	4		1		5	17	16	$115.00	$490.00	$67.50

LF-10

ONE SECOND DEGREE ASSAULT CASE AMENDED TO THIRD DEGREE ASSAULT.

POLICE DIVISION - TRAFFIC CONTROL STATISTICS
AUGUST, 1953

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	July	August	July	August	July	August	July	August
Richland	12	12	0	0	0	3	0	3
North Richland	7	4	0	0	0	0	2	0

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Cases	
	July	August	July	August	July	August	July	August
Richland	5	0	2	5	0	2	5	5
North Richland	2	1	0	0	1	0	4	2

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	July	August	July	August	July	August	July	August	July	August	July	August	July	August
Richland	0	0	0	0	4	7	1	0	1	0	4	0	10	7
North Richland	1	0	0	0	7	75	0	2	0	4	0	0	8	81

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way V.		Neg. Drv.		Parking V.		Other V.		Totals	
	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	August
Richland	50	34	20	25	5	5	3	2	3	3	26	10	73	3	63	35	243	117
N. Richland	7	21	15	12	2	6	3	0	0	2	5	9	16	5	33	22	81	77

TRAFFIC VOLUME: Average 24-Hour Traffic Volume Count for week ending August 29, 1953, Thayer Drive South of Duportail, 2,185 cars.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY.

IF-11

1206149

COMMUNITY OPERATIONS

RICHLAND FIRE DEPARTMENT

AUGUST 1953

Organization and Personnel	Exempt	Non-Exempt
Employees - Beginning of Month	66	0
Transfers In	0	0
Transfers Out	1	0
New Hires	1	0
End of Month	66	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$150.00	$ 0.00
	Personal	306.75 *	762.59
	August Total	$456.75	$762.59
	1953 Total	$184,497.07	$3,439.74

*Loss total not yet compiled on the August 21st Cahoon Motors fire, therefore not included in this figure.

Response To Fire Alarms	23	33
Investigation of Minor Fires & Incidents	5	0
Ambulance Responses	33	
Inside Schools or Drills	32	5
Outside Drills	26	6
Safety Meetings	8	2
Security Meetings	4	1
Fire Alarm Boxes Tested	165	96

A total of 2,950 feet of 2½ inch and 1,000 feet of 1½ inch fire hose received a semi-annual pressure test.

The Richland Fire Department responded on a mutual-aid fire call with the Enterprise volunteer company to an August 15th residential fire in Heminger City. In view of the fire's prograss at the time apparatus was summoned, the home of a Project employee could not be saved.

Five new fire alarm boxes, serving the Chief Joseph Apartment area, were placed in service on August 13th.

One Boy Scout was examined for Firemanship Merit Badge on August 24th.

Fire Prevention

During August, 177 building hazard inspections were made in Richland and 14 in North Richland, resulting in 30 hazard reports. Two hundred seventy two fire extinguishers were inspected, 10 installed, 9 removed, 7 recharged and 5 relocated. Sixteen fire hose standpipes were inspected.

A home fire-safety pamphlet and baby sitters' guide was prepared for the Richland Safety Council for distribution to newcomers by the Richland Welcome Wagon Service.

Preliminary meetings and conferences were held during August to lay the groundwork fore the 1953 observance of Fire Prevention Week. A total of 30,000 pieces of promotional material was obtained for this campaign.

Alteration plans for the 761 Building were reviewed with Plant Safety and Engineering.

Objection was filed relative to planned installation of propane gas tanks on alley easement property in the Uptown business district.

Discussions were held with AEC Community Management and a report submitted to school officials relative to planned use of the old American Legion building for storage purposes by School District 400.

Guthrie Construction Company superintendent was contacted relative to trash fires left unattended after working hours in the new construction area.

Inspections indicate that hazardous trash conditions and traffic conjestion continue in the Uptown business district alley.

An inspection committee composed of the Fire Marshal, Community Engineering representative and the architect found several code violations in the new American Legion building. Corrections were assured.

The spray paint booth code violations at Anderson Motors, reported in April, were found to still exist on the August 25th inspection of this facility.

Hazardous wiring conditions in the 760, 761 and 762 buildings resulted in the request for an electrical survey of these buildings.

Efforts were made through the Chamber of Commerce and Real Estate Section to have firm names placed on the rear doors of all commercial houses.

Inspection revealed that none of the serious hazards reported July 13th in the Pennywise Drug had been corrected on August 31st. Failure of fluorescent light fixture in this building, causing a fire alarm on August 30th, resulted in a "Do Not Use" tag being affixed to the switch, pending re-installation of the fixtures according to code.

COMMUNITY OPERATIONS AND REAL ESTATE DEPARTMENT
ENGINEERING UNIT

AUGUST 1953

PERSONNEL	Exempt	Non-Exempt*	Total
Employees - Beginning of Month	6	3	9
Employees - End of Month	6	3	9

*One employee on permanent loan

ENGINEERING UNIT JOBS COMPLETED DURING MONTH OF AUGUST

ESR 612 "As Built" Plans for Richland Thrifty Drug
ESR 628 "As Builts" Richland Fire Alarm System
ESR 686 Utility Lines, Vacant Commercial Sites
ESR 755 Prep. Engineering, Tie-in Richland & North Richland Fire Alarm Systems
ESR 775 Legal Description - Randolph Insurance
ESR 767 Plans, Specifications & Inspections, Joseph-Cannon Bldg. Lee & Geo. Washington
ESR 796 Legal Description, Plot East of Washington State Liquor Store
ESR 802 Legal Description, Veterinary Hospital Site
ESR 826 Drainage, Marshall Avenue & Van Giesen Street
ESR 840 Site Plan, Desert Inn
ESR 850 "As Builts" Cannon-Joseph Building #1, Lee & George Washington Way

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED

PROJECTS:

25.7 Kadlec Hospital Grounds Improvement - Plans and specifications being prepared for construction.

C-488 Additional Erosion Control and Development, Public Areas, FY 1952 - Construction of Jason Lee Playground 50% complete. Shelterbelt 100% complete.

K-753 Flow Control Valve, Sewage Treatment Wet Well - Awaiting delivery of equipment.

K-756 Installation Traffic Light, Symons & George Washington Way - Awaiting delivery of equipment.

K-825 Community Fireplace at Columbia Playfield - Equipment and materials on site. Awaiting scheduling of craft workers to do work.

K-848 Fire Protection Line, JJ Newberry Bldg. - Work order prepared. Materials on order.

L-728 Installation of Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Department.

S-808 Replacement 10" Water Main, 700 Area - Design complete. Bid opening scheduled for September 1, 1953 at 2:00 PM.

ENGINEERING UNIT

ENGINEERING SERVICE REQUESTS:

571-M Free Methodist Church - 99% complete. No progress this month.

572-M First Baptist Church, Plan Checking - 80% complete. Progressing slowly.

574-M Assembly of God Church, Plan Checking - 70% complete. Progressing slowly.

581-RC "As Built" Plans for LDS Church - Plans received. Begin checked as time allows.

588-M Alteration Permits - An open active file.

634-M Engineer Liaison, Richland Water - Following construction closely by making periodic inspections.

663-M Plan Checking, Richland Development Co. - 99% complete. Final inspection to be made.

706-RC Plans, Specifications, Inspections, Medical-Dental Properties - 99% complete. Final inspection to be made.

715-M Television Antennae - An open active file.

722-M Erosion Control & Development of Public Areas, F.Y. 1953 - Project prepared and ready for submission.

726-M Plans, Specifications, Inspections, CD Joseph Bldg. #4 - 99% complete. Final inspection to be made.

729-M Plans, Specifications, Inspections, Grace Bacon Bldg. - 20% complete. Work progressing slowly.

730-M Plans, Specifications, Inspections, Richland Realty Company, Symons and Jadwin, (JJ Newberry Store) - 35% complete. Work progressing as fast as material arrival permits.

765-RC "As Builts" All Saints Episcopal Church - Deferred for other work.

768-M Plans, Specifications, Inspections, Carl Peterson Bldg. Lee & Gillespie (Linn Motors) - 99% complete. Construction exceptions reported to be corrected by letting of new contract.

770-M Latter Day Saints Storehouse, West Jadwin - 70% complete. Work progressing.

779-M Plans, Specifications, Inspections, Richland Labor Temple - 85% complete. Work progressing according to schedule.

783-M Plans, Specifications, Inspections, American Legion Bldg. - 99% complete. Construction exceptions to be corrected.

785-RC "As Builts" McVicker Bldg. #4 - Plans received. Deferred for other work.

ENGINEERING UNIT

790-M "As Builts" General - Work progressing steadily, rate of progress depending on availability of personnel.

803-M Profile Grade, 300 Block on Craighill - 90% complete.

804-RC Study, Roof Richland Lutheran Church Bldg. - Being completed by Engineering Department. Reported nearly complete.

805-RC Plans, Specifications, Inspections, Cannon Joseph Bldg. West of Kennell-Ellis Work Progressing. 35% complete.

806-RC Plans, Specifications, Inspections, Richland Development Co. Block 2, Uptown - 80% complete. Work progressing.

809-RC Plans, Specifications, Inspections, Parcell Bldg., Duportail and Hartford - Plans received for review. Owner has indicated plans submitted might not be used, so further work on them delayed.

811-RC Extend water & sewer, Parcell Site at Duportail & Hartford - Design deferred for other work.

815-RC Plans, Specifications, Inspections, Veterinary Hospital - Plans not received.

816-RC Plans, Specifications, Inspections, Righland Transfer & Storage (HW Weber) - Plans reviewed. To be re-submitted with alterations to original plans.

817-RC Plans, Specifications, Inspections, Diana Langevin Bldg. - Plans checked. Lessee proceeding with work without permit.

818-RC Plans, Specifications, Inspections, McVicker Bldg. (East of Liquor Store) - Plans not received.

819-RC Plans, Specifications, Inspections, Safeway Store - Plans reviewed. Forms for application for building permit have been forwarded to the architect for submission.

820-M Landscape Design for 300 Area - Preliminary plans and cost estimate submitted for review.

822-RC Plans, Specifications, Inspections, EH Kidwell Service Station, Plans not received.

827-RC Plans, Specifications, Inspections, Paul Lewis Building (#1) - Plans not received.

828-RC Plans, Specifications, Inspections, Paul Lewis Building (#2) - Plans not received.

829-M Design Plans and Specifications, Storm Drain, George Washington Way - 80% comple

832-M Inspection & Liaison, Spokane Housing, Inc. - Work continuing.

ENGINEERING UNIT

833-M Inspection & Liaison, Bauer-Day Housing - Work continuing.

836-RC Plans, Specifications, Inspections, Church of Nazarene Addition - 30% complete. Work progressing slowly.

837-CA Cost Estimate, Replace water tank, Recreation Hall Building - Deferred for other work.

839-RC Legal Description, Metal Hutment Warehouses 1125-3 and 1125-4 - 90% complete.

841-RC Legal Description, and Utility Study, Seattle First National Bank Addition - 90% complete.

842-RC Plans, Specifications, Inspections, Kaiser-Johnson Store Addition - Plans reviewed. To be re-submitted with corrections as concerned with code.

844-RC Legal Description, Richland Heights Baptist Church - 90% complete.

845-RC Plans, Specifications, Inspections, Seattle First National Bank Addition - Plans reviewed. Awaiting lease approval notice before issuing permit.

846-AEC 24" Replacement Sewer, Swift Boulevard and Gribble Street Improvement - Design 75% complete.

847-M Inspection McMurray Street Improvement - Bids opened August 13, 1953. Awaiting issuance of notice to proceed by AEC.

851-RC Revised Legal Description, Kaiser's Market - 85% complete.

REAL ESTATE SECTION

SUMMARY

AUGUST 1953

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Real Estate Section				
350	2	1	2	1
Housing & Maintenance Unit				
351	5	18	5	18
353	12	154	12	150
Commercial Property Unit				
357	6	6	6	6
	25	179	25	175

Decrease in number of employees 4

GENERAL

One lessee of a Government-owned commercial building terminated its lease.

Eight new sublessees of privately-owned commercial buildings opened for business.

One new sublessee of a Government-owned building opened for business.

One sublessee of a Government-owned commercial building terminated its lease.

The two lease awards to Paul R. Lewis for the construction of service stations in the Light Industrial Area were rescinded.

HOUSING & MAINTENANCE UNIT

August, 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

Beginning of month:	17 exempt	
	172 nonexempt	
	189	189
End of month:	17 exempt	
	168 nonexempt	
	185	185

RICHLAND HOUSING

Housing Utilization as of month ending August 31, 1953

Housing occupied by family groups

	Conventional	A&J	T	Precut	Ranch	Prefab	Dorm Apts	A&J Apts	2BR Apts	4th Housing	Tract	Total
General Electric	2220	255	8	379	809	1179	10	52	61	194	36	5203
Commercial Facilities	100	14		33	80	52		5	3	9	2	298
Community Activities	9			1	7	5					1	23
Medical Facilities	4	19			3	1				3		30
Post Office	5				2	11				1	3	22
AEC	85	27		25	63	17		5	4	16	3	245
Other Government	6	2			4	2					1	15
Schools	53			6	10	55		1	1	2		128
Charles T. Main	2			2	5	9				2		20
Kaiser Engineer	6	8			6							20
J. A. Jones	2	2		1	2	1						8
Vitro Corporation		3			1			1				5
P. S. Lord	1				2					1		4
Minor Contractors					1	2						3
Vernita Orchards											5	5
A&J					1							1
Blaw-Knox		1		2								3
Commonwealth Inc.						1						1
Total	2493	331	8	449	996	1335	10	64	69	228	51	6034
Houses assigned leases written	1	1				1				1		4
Houses assigned leases not written	6	1	2	1	4	5			1	1		21
Available for assignment Total	2500	333	10	450	1000	1341	10	64	70	230	51	6059

	Begin Month	Moved In	Moved Out	End of Mo.	Diff.
Conventional	2490	44	41	2493	+ 3
A&J	333	1	3	331	- 2
T	10	1	3	8	- 2
Precut	446	10	7	449	+ 3
Ranch	1000	7	11	996	- 4
Prefabs	1330	44	39	1335	+ 5
Dorm Apts	10			10	
A&J Apts	63	1		64	+ 1
2BR Apts	70	4	5	69	- 1
Fourth Housing	230	2	4	228	- 2
Tract Housing	51			51	
Total	6033	114	113	6034	+ 1

August 1, 1953

DORMITORY REPORT

Dormitories:

	Beds Available	Vacant Beds	Occupied Beds
Men	616	57	559
Women	431	45	386*
Total	1047	102	945*

*This includes 2 beds used for Dorm Office
Dormitory W 16 was closed this month.

Waiting Lists

	Single Rooms	Double Rooms
Men	37	0
Women	60	0

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS	
Voluntary terminations	36
R. O. F.	1
Discharge	0
Transfers	5
Retirement-divorce-misc.	9
Move off project	22
Deaths	1
Wherry Housing	7
Total	81

ALLOCATIONS	
Houses allocated to new tenants	80
Exchanged houses	10
Moves	13
Turnovers	9
Total leases signed	112
Total cancellations	107
Houses assigned "As Is"	53
Houses sent to renovation	39
Applications pending	465

TENANT RELATIONS PROGRESS REPORT

	Orders Incomplete as of July 31	Orders Issued 7-30 to 8-30	Total Orders Incomplete as of August 30, 1953
Service orders	198	1506	434
Work orders	670	600	813
Service charges		274	

Principal work order loads

	Incomplete as of July 30, 1953	Incomplete as of August 30, 1953
Laundry tub replacement	3	11
Bathroom renovations (tub, tile, lino.)	34	27
Tileboard - bathroom	2	1
Kitchen floor linoleum	104	81
Kitchen cabinet linoleum	81	11
Shower stall	11	16

---

98 alteration permits were issued, as compared to 96 permits issued during July.

Air conditioners installed	25	Install exhaust fan	1
Install fence	6	Install back door	2
Install oil burner	7	Remove broom closet	1
Install automatic washer	20	Remove partition between coal room and furnace room	1
Install automatic dryer	8	Construct patio	2
Install TV antenna	4	Install slab in basement	1
Basement excavation	5	Install dishmaster	1
Install sidewalk	1	Install water softener	3
Install humidifier in furnace	1	Reverse range and refer	2
Install garbage disposal	2	Install driveway	1
Install coal stoker	2		
Move hot water heater	1		
Install barbeque pit	1		

1400 inspections were made, as compared to 1313 made in July.

Alteration permits	15	Sinks	15
Bathtubs	272	Tileboard	19
Cupboards	1	Toilet seats	39
Drainage	1	Topsoil	2
Floor boards	6	Dormitories	146
Jack & Shim	3	Walls	4
Leaking basements	119	Windows	3
Paint	130	Miscellaneous	255
Porch & steps	23	Renovations	106
Shower stalls	9	Cancellations	112
Sidewalks	11	Shows (new tenants)	109

MONTHLY REPORT
REAL ESTATE MAINTENANCE

1. ENGINEERING STUDIES AND PROJECTS:

   1. Project S-939 - Bus Depot Heating Alterations

      All work 98 - per cent completed. Final inspection held August 26, 1953, with only minor exceptions noted.

   2. Project S-945 - Floor Covering - Anderson's Department Store

      Work started August 24, 1953, and is approximately 60-per cent complete.

   3. ESR 946 R. C. - Alteration to Water Heating Facilities - Bowling Alley

      All work completed on change-over from the Steam Heated Water System to the Electric Tank System.

GENERAL

1. Approximately 85-per cent complete with exterior painting of Ranch Houses.
2. Started moving crews to the Interior Redecorating Program August 22, 1953.
3. Started exterior painting of Government-owned commercial facilities August 26, 1953.

REAL ESTATE MAINTENANCE PROGRESS REPORT

AUGUST 1953

WORK SUMMARY

JOB TYPE	ISSUE DATE	BACKLOG	JOBS COMP.	COMP. TO DATE F. Y. 1953
BATHTUBS	8-3-1953	68	42	76
KITCHEN FLOOR TILE	1-7-1953	83	32	83
BATHROOM TILE	8-7-1953	2	1	1
KITCHEN SINK TOP	4-21-1953	4	70	123
SHOWER STALLS	5-29-1953	17	0	2
LAUNDRY TUBS	5-27-1953	11	6	9
MAJOR SEWER STOPPAGES	---	--	34	60
ROOF COATING	1-15-1953	5	15	15
REMOVE TREES	3-5-1953	33	30	43
RENOVATION	8-20-1953	10	39	71
WATER HEATERS	---	2	15	25
REBUILD PORCHES	4-2-1953	53	30	36
ASPHALT SERVICE WALKS	6-17-1953	28	20	39
ASPHALT STEPS	6-18-1953	8	5	8

MONTHLY PROGRESS REPORT
EXTERIOR PAINTING PROGRAM
FISCAL YEAR - 1954

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	68			68
B	220			220
C				
D				
E	21			21
F	45			45
G				
H	57			57
K				
L	4			4
M				
Q				
R				
S				
T	10			10
U				
V				
Y	950	428	784	166
Z	50	24	33	17
1 BR. Apt	40		40	0
TOTAL	1465	452	857	608

Exterior Painting of Ranch Houses 85% Complete
Spray work is in progress on Commercial facilities
One Group (24-men) will be on Interior Paint Program approximately September 5.

1206163

PLUMBING SHOP

JOB DESCRIPTION	NO. COMPLETED
Replacements - Major Fixtures	
Bathtubs	42
Laundry Tubs	6
Electric Water Heaters	15
Routine Plumbing Repairs	15
Plumbing for Floor Tile Replacements	38
Cleared Major Sewer Stoppages caused by Tree Roots	34
Steam Work Orders	17

Routine Steam inspection in Dormitories and Government-owned Commercial Buildings on a Weekly basis.

SERVICE ORDER CREW

The following is a status report on Service Orders:

A. On hand at the beginning of the Month	95
B. Received during the Month	1476
C. Completed during the Month	1484
D. On hand at the end of the Month	87

E. A Total of 555.4 Hours (Man Hours) were spent on work orders.

MECHANICAL SHOP

A. MILLWRIGHT CREW

JOB DESCRIPTION	NO. COMPLETED
Furnace Service Orders	29
Furnace Inspections and lubrications	650
Cooler Inspections and lubrications - All Dormitories	96
Mechanical inspection and lubrication - All Commercial Facilities	

MECHANICAL SHOP

A. MILLWRIGHT CREW - continued

GENERAL

One man has been working on stainless steel sampling assignment for the past 2-weeks.

B. SHEETMETAL CREW

1. This crew has been on inspection and replacement of smoke pipes in conventional type houses. Smoke pipe replacement in South end of town is running about 15-per cent of houses inspected. Practically all require retaping and minor duct repairs. Approximately 400 houses have been inspected.

2. Flashings were installed on C. C. Andersons; Safeway; Shoe Shop; Diamond Store; Style Center, and Women's Apparel Shop

RENOVATION AND LABOR CREW

JOB DESCRIPTION	NO. COMPLETED
Housing Units Renovated	39

Performed miscellaneous work including assisting the Plumbing Shop with sewer repairs. Also routine work in repairing side walks, removing trees, repairing steps, repairing compound, picking up drain oil from service stations, etc.

LINOLEUM CARPENTRY CREW

JOB DESCRIPTION	NO. COMPLETED
Replace Bathtubs	42
Replace bath wall tile	29
Replace bath floor tile	36
Repair bath floor tile	1
Replace kitchen floor linoleum	32
Repair kitchen floor linoleum	5
Replace steps and landings	5
Replace kitchen sink top linoleum	70
Repair kitchen sink top linoleum	16
Replace work bench linoleum	7
Repair work bench linoleum	1
Replace kitchen sinks	6
Replace living room linoleum	1
Replace dining room linoleum	1

LINOLEUM & CARPENTRY

JOB DESCRIPTION - continued	NO. COMPLETED
Repair living room linoleum	1
Repair bedroom linoleum	2
Repair utility room linoleum	2
Replace utility room linoleum	1
Repair windows - Shop	20
Repair window screens - Shop	290
Make new window screens - Shop	3
Drill weepholes	11
Apply roof coating	15
Repair roof	6
Time spent on Roof Repair - Commercial facilities	32.0 M.H.
Repair porches	30
Repair siding	1
Raise Slab	5
Jack & Shim	3
Replace door sill	1
Repair exterior main doors - Shop	11
Repair thresholds	13
Repair laundry trays	2
Reset Clothes Lines	2
Repair basement walls	1
Concrete Work - Steam Pits - Dormitories	1
Repair for Painters	10.5 M.H.
Repair for Plumbers	2.0 M.H.
Repair for Millwrights	2.0 M.H.
Repair Fire Damage	1
Time spent on Mock-up Work - B-75065	189.0 M.H.
" " " " " - C-58028 #1	107.0 M.H.
" " " " " - C-58026 #2	32.0 M.H.
Time spent on Shop Equipment	40.0 M.H.
Repair Cabinets	1
Cabinet Doors repaired - Shop	4
Cabinet Doors replaced - New from Shop	22
Cabinet Drawers repaired - Shop	19
Cabinet Drawers replaced - New from Shop	8
Chempoint - Routine	34
Chempoint - Work Orders	109
Paint Touch-ups Completed	84
Paint Work Orders completed in Shop	0
Interior Carpentry Repair to all types houses (4 yr. cycle)	79
Interior Carpentry Repair to Commercial Facilities	2.0 M.H.
Exterior Carpentry Repair - Commercial Facilities	238.0 M.H.
Exterior Carpentry Repair - Dormitories	1.0 M.H.
Ranch House Screen Doors Repaired	6
Ranch House Screen Doors replaced - New	3
Precut Screen Doors Repaired	2

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION
August, 1953

PERSONNEL - COMMERCIAL PROPERTY UNIT:	August
Beginning of Month	12
End of Month	12
Net Change	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
July	1,573	189	121	1	1,694	190
August	1,530	184	121	1	1,651	185
Net Change	-43	-5	0	0	-43	-5

SUMMARY OR ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	72	24	0	0	72	24	96
Back Charges	3	0	0	0	3	0	3
FY Work Order Total	561	316	56	0	617	316	933
FY Back Charge Total	48	0	15	0	63	0	63

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Leases:

a. James R. Parcell - a ground lease covering the construction and operation of a service station at Hartford and Duportail Streets.

b. Railway Express Agency - a lease of Building 1125-2 for the operation of an express agency.

c. Diana Langevin - a gound lease covering the construction and operation of an investment building in the Downtown Business Area.

d. Henry W. Weber - a ground lease covering the construction and operation of a transfer and storage facility in the Heavy Industrial Area.

e. Corrine Joseph and Hugh S. Cannon - a ground lease covering the construction and operation of an investment building in the Uptown Business Area.

1206167

2. Supplemental Agreements:

a. Richland Supply Company - to provide for payment of electricity on a meter basis with an allowance to Operator on account of such payment.

B. Noncommercial:

1. Leases:

a. Columbian Club, Inc.- a lease covering the operation and maintenance of a meeting and recreational place for the Knights of Columbus.

2. Supplemental Agreements:

a. Richland Assembly of God - to provide for a longer lease term and to restate and redefine the rights and duties of Lessor and Lessee.

GENERAL:

A. Commercial:

1. L. E. Sherwood opened a watch repair and jewelry shop in Densow's Drugstore.

2. A & Z Specialty opened for business in Richland Development Company Building, Block 2, Uptown Business District.

3. David's Shoe Store opened for business in Richland Development Company Building, Block 2, Uptown Business District.

4. Eiler's Shops, Inc. opened for business in Richland Development Company Building, Block 2, Uptown Business District.

5. Friesen's, Inc. opened for business in Richland Realty Company Building, Block 5, Uptown Business District.

6. Clynch-Cobley Self-Service Laundry opened for business in Richland Development Company Building, Block 2, Uptown Business District.

7. Ben Charlesworth & Son, Inc. opened for business in Automatic Laundry Company Building, Block 5, Uptown Business District.

8. Moran & Hayden opened for business in Automatic Laundry Company Building, Block 5, Uptown Business District.

9. The two lease awards to Paul R. Lewis for the construction of service stations in the Light Industrial Area were rescinded.

10. The Railway Express Agency terminated their lease of space in the government-owned building located at 908 Goethals.

11. Dewey Skaggs subleased the space in the Desert Inn, formerly occupied by Seth Morrow, for the continued operation of the barber shop.

12. Martin and Tuttle terminated their sublease agreement, dated April 1, 1950, with Klopfenstein's, Inc.

120168

B. Noncommercial:

1. 3 pasture permits were issued.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of commercial enterprises:

Richland	North Richland
Golf Driving Range Poultry Production	None

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

	JULY			AUGUST		
	Richland	North Richland	Total	Richland	North Richland	Total
A. COMMERCIAL						
1. Number of Government-owned Buildings	39	8	47	39	8	47
a. Number of Prime Lessee Businesses	39	9	48	39	9	48
b. Number of Sublessee Businesses	18	0	18	17	0	17
c. Total Businesses in Government-owned Bldgs.	57	9	66	56	9	65
2. Doctors and Dentists in Private Practice	27	0	27	27	0	27
3. Number of Privately-owned Buildings	50	7	57	50	7	57
a. Number of Prime Lessee Businesses	39	6	45	39	6	45
b. Number of Businesses operated by Sublessees	81	2	83	89	2	91
c. Total Businesses in Privately-owned Bldgs.	120	8	128	128	8	136
4. Privately-owned Buildings under Construction	12	0	12	12	0	12
5. Total number of Businesses in Operation	177	17	194	184	17	201
B. NONCOMMERCIAL						
1. Government-owned Buildings						
a. Churches	4			4		
b. Clubs and Organizations	8			8		
c. Government Agencies	3			3		
Total	15			15		
2. Privately-owned Buildings						
a. Completed and in Use	10	1	11	10	1	11
b. Under Construction	6		6	6		6
Total	16	1	17	16	1	17
3. Pasture Land Permits	99		99	102		102