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MONTHLY REPORT

COLLECTION Atmospheric Release HANFORD ATOMIC PRODUCTS OPERATION

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AUGUST 1954

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Compiled By
DEPARTMENT MANAGERS

September 17, 1954

RICHLAND, WASHINGTON

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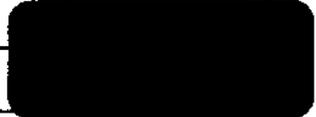
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7 - 8	Atomic Energy Commission Hanford Operations Office Attention: D. F. Shaw, Manager
9	Atomic Energy Commission Hanford Operations Office Attention: J. J. Joyce
10	Atomic Energy Commission For: B. M. Fry, AEC, Washington
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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

AUGUST 1954

GENERAL SUMMARY

PRODUCTION OPERATIONS

In the Metal Preparation Section production for the month was 101 percent of official forecast and a new production record was established. The overall canning yield for August was 81.4 percent which was approximately the same for July.

The total reactor input plutonium production was 112 percent of official forecast, principally because of higher than forecast operating efficiency. Two eight inch uranium slug failures occurred during the month. In addition, two C material pieces (one not confirmed at month end) and two J pieces also ruptured.

The total production of Redox and T plants for the month was 76 percent of forecast, with that of the individual plants being 69 and 128 percent respectively. TBP production was 149 percent of forecast with parallel operation continuing throughout the month. UO₃ production was 114 percent of forecast. Commitments for 234-5 production were not met, principally because of rescheduling problems involved with a change in Commission requirements.

ENGINEERING TECHNOLOGY

Total design for Project CG-558, Reactor Plant Modification for Increased Production advanced to 30.8 percent. Detailed design for the ultrasonic bond test equipment for CA-514, 300 Area Expansion, advanced to 15 percent completion.

Study of the feasibility of automatic operation of Hanford Processes is being started. Automation at Hanford may be unusually advantageous since provision of remote control mechanisms, which is a major expense associated with automation of conventional plants, already exists for a large part of the plant.

Twenty-three informal, 4 Class I and one Class II radiation incidents were recorded.

PERSONNEL AND SERVICES

There were no major injuries recorded during the month of August. There were 307 minor injuries during August, as compared with 310 in July.

The employee separation rate increased from .67% for July to .85% for August.

Under the new classified document control system, the first cycle of inventory lists was completed within the allotted 30-day period. Initial distribution of individual classified document holdings was made by the Operations Analysis Section on August 2, 1954. Every holder of classified documents received a listing of his holdings which he was required to certify. In the future, distribution will be made to all plant chargees on a cyclical basis, once each month, for certification.



STAFF

General Manager, Atomic Products Division F. K. McCune

General Manager, Hanford Atomic Products Operation W. E. Johnson

Counsel G. C. Butler

Manager, Finance D. M. Johnson

Manager, Employee and Public Relations C. N. Gross

Director, Radiological Sciences H. M. Parker

Manager, Engineering A. B. Greninger

Manager, Manufacturing J. E. Maider

Manager, Plant Auxiliary Operations H. D. Middel



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HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
AUGUST 31, 1954

	EXEMPT		OTHER		TOTAL	
	8-31-54	7-31-54	8-31-54	7-31-54	8-31-54	7-31-54
<u>Engineering Department</u>						
General	19	19	85	81	104	100
Design	175	173	121	126	296	299
Project	261	269	154	154	415	423
<u>Technical Section</u>						
General	10	10	3	3	13	13
Applied Research	121	121	54	51	175	172
Separations Technology	114	114	46	44	160	158
File Technology	105	107	65	67	170	174
Fuel Technology	65	69	81	79	146	148
Advance Technology	10	11	1	1	11	12
<u>Manufacturing Department</u>						
General	14	15	7	7	21	22
Reactor	277	272	1 202	1 178	1 479	1 450
Separations	280	284	1 259	1 248	1 539	1 532
Metal Preparation	97	98	498	479	595	577
<u>Plant Auxiliary Operations Department</u>						
General	1	1	1	1	2	2
Elec. Utility	17	28	70	136	87	164
Telephone	11	28	66	136	77	164
Transportation	44	44	448	450	492	494
Purchasing & Stores	55	56	231	238	286	294
<u>Plant Protection</u>						
General	1	1	1	1	2	2
Patrol & Security	59	59	433	433	492	492
Safety & Fire	30	30	106	106	136	136
Office Services	13	13	194	198	207	211
Administration Main Service	12	12	89	88	101	100
Operations Analysis	37	38	65	64	102	102
<u>Financial Department</u>						
Financial General	6	6	8	7	14	13
Costs & Budgets	27	27	100	101	127	128
General & Personnel Accounting	17	18	121	114	138	132
Property Accounting	15	16	43	41	58	57
Audits & Procedures	18	18	4	4	22	22
SF Accountability	6	6	21	21	27	27
<u>Employee & Public Relations Dept.</u>						
Community	88	89	349	346	437	435
Health & Safety	56	54	208	209	264	263
Management	6	6	2	2	8	8
Salary Administration	10	10	11	10	21	20
Employee Relations	13	11	36	35	49	46
Public Relations	8	8	27	27	35	35
Union Relations	4	3	2	2	6	5
<u>Education & Training</u>						
Staff	7	8	5	5	12	13
Others	-	-	62	71	62	71

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	EXEMPT		OTHER		TOTAL	
	<u>8-31-54</u>	<u>7-31-54</u>	<u>8-31-54</u>	<u>7-31-54</u>	<u>8-31-54</u>	<u>7-31-54</u>
<u>Radiological Sciences Department</u>						
General	3	3	5	5	8	8
Records & Standards	26	26	114	138	170	164
Biophysics	58	59	59	60	117	119
Biology	33	33	37	38	70	71
Engineering	6	6	1	1	7	7
Legal	3	3	3	2	6	5
Special Study	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>5</u>	<u>5</u>
Total	<u>2 241</u>	<u>2 257</u>	<u>6 530</u>	<u>6 474</u>	<u>8 771</u>	<u>8 731</u>

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AREA PERSONNEL DISTRIBUTION
AUGUST 31, 1954

	100-B AREA	100-D AREA	100-F AREA	100-H AREA	100-K AREA	101 AREA	200-B AREA	200-W AREA	300 AREA	700-1100-3000 AREA AND PLANT GENERAL	TOTAL
<u>Engineering Department</u>											
Exempt	27	68	2	13	45	62	60	282	323	880	
Other	15	33	2	59	14	20	28	223	216	610	
Total	<u>42</u>	<u>101</u>	<u>4</u>	<u>72</u>	<u>59</u>	<u>82</u>	<u>88</u>	<u>505</u>	<u>539</u>	<u>1 490</u>	
<u>Manufacturing Department</u>											
Exempt	62	58	62	74	19	17	261	97	18	668	
Other	219	350	284	227	38	142	1 116	495	15	2 966	
Total	<u>381</u>	<u>388</u>	<u>346</u>	<u>301</u>	<u>57</u>	<u>159</u>	<u>1 377</u>	<u>592</u>	<u>33</u>	<u>3 634</u>	
<u>Plant Auxiliary Operations</u>											
Exempt	26	7	7	7	7	11	17	11	187	280	
Other	54	49	81	58	71	64	161	105	1 050	1 704	
Total	<u>80</u>	<u>56</u>	<u>88</u>	<u>65</u>	<u>78</u>	<u>75</u>	<u>178</u>	<u>116</u>	<u>1 237</u>	<u>1 984</u>	
<u>Financial Department</u>											
Exempt				1	2	1	2	5	80	89	
Other				2	2	1	1	17	275	297	
Total				<u>3</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>22</u>	<u>355</u>	<u>386</u>	
<u>Employee & Public Relations</u>											
Exempt		2		1	1	4	2	2	181	192	
Other	5	8	12	4	4	2	8	31	631	702	
Total	<u>5</u>	<u>10</u>	<u>12</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>10</u>	<u>33</u>	<u>812</u>	<u>894</u>	
<u>Radiological Sciences</u>											
Exempt			34			2	17	60	11	126	
Other	6	40	40	74		6	20	156	18	246	
Total	<u>6</u>	<u>74</u>	<u>74</u>	<u>74</u>		<u>8</u>	<u>37</u>	<u>216</u>	<u>29</u>	<u>372</u>	
<u>General</u>											
Exempt									6	6	
Other									5	5	
Total									<u>11</u>	<u>11</u>	
Total Exempt	117	135	103	96	71	97	359	457	806	2 241	
Total Other	399	420	419	350	126	234	1 334	1 027	2 210	6 530	
GRAND TOTAL	<u>516</u>	<u>555</u>	<u>522</u>	<u>446</u>	<u>197</u>	<u>331</u>	<u>1 693</u>	<u>1 484</u>	<u>3 016</u>	<u>8 771</u>	

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MANUFACTURING DEPARTMENTAUGUST, 1954METAL PREPARATION SECTION

The net production of acceptable slugs was 318 tons which established a new production record. This output was 101 percent of the official forecast. All canning was of the 8-inch material with a yield of 81.4 percent which was approximately the same for July.

The fifth canning line was put into operation on August 23.

Salt bath heat treating of untransformed slugs on a production basis started on August 20. At month end these slugs were being canned by the lead dip method with no unusual difficulties.

The Zyglo bare slug inspection operation was discontinued on August 27. After two months experience with the Zyglo inspection, it was concluded that this method did not reveal defects other than those detected by inspection after pickling.

There were no autoclave failures of regular metal during the month. One thorium slug failure was attributed to a faulty slug core.

A total of 2,696 thorium slugs was canned during the month. This completes the requirements of the present program, except for 300 pieces that are to be hot press canned at a later date.

REACTOR SECTION

The total reactor input plutonium production was 112 percent of the official forecast principally because of higher than forecast operating efficiency. The overall reactor operating efficiency was 87.4 percent as compared to 87.1 in July and the 80.0 percent in the forecast. The operating difficulties affecting production were water leaks that required tube testing at B and C reactors, and cracks that developed in the downcomer at B reactor.

Discharges of approximately 190 and 100 tons of low and other concentration material respectively were 92.0 and 448.5 percent of forecast. The significantly larger than forecast discharge of higher concentration material resulted from the discharge of four inch material at B, D, and F reactors at concentrations less than forecasted in order to minimize slug rupture frequency.

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

Two eight inch uranium slug failures occurred during the month. In addition, two C material pieces (one not confirmed at month end) and two J pieces also ruptured.

REACTOR SECTION (Continued)

The total outage time resulting from these ruptures was 112.3 hours. Three of the ruptures were pushed during minimum scram recovery time using quickie equipment.

Horizontal rod operating experience continued to be good during August with only one rod thimble at F reactor requiring replacement. A flexible half rod of the new oval design which requires no thimble was installed in No. 8 channel at F Reactor. All horizontal rods at C and B Reactors were tested for leaks, with no leaks being found. Several rods at C Reactor required flushing to remove sediment accumulations resulting from normal film and corrosion buildup in order to restore flow to normal. No. 9 was flushed out and returned to service, while Nos. 3, 15, and 18 were removed from service to be flushed during the next outage together with Nos. 1, 6, and 13 which are beginning to show a reduced flow. At D Reactor No. 5 rod, which had been binding when approximately half way into the reactor, was found to stick tight when the reactor is cold. No unusual conditions were found when the rod was leak tested and the thimble visually examined, and the rod continued to be in limited service at month end.

During August, 22 reactor scrams occurred. Of these, 14 were caused by normal panellit difficulties at all reactors. Three scrams at H Reactor were caused by tube 0961 which is in production test service on recirculation studies. One scram at C Reactor was caused by low voltage which resulted when a steam siphon line solenoid burned out. Unexplained Beckman trips caused a scram at each of the B and DR Reactors; D was scrambled along with DR by the D-DR intertie system. D also had one scram by a panellit trip resulting from a plugged cone screen. The total outage time charged to these scrams was 10.8 hours.

Two major process tube leak testing programs occurred in August. At C Reactor, because of the high water collection rates which continued after the July tube leak was corrected, all process tubes, horizontal rods and the thermal shield loop tubes were tested without locating any significant leaks. Operation was resumed and collection rates returned to normal approximately 12 days later indicating either that several minor leaks were corrected or that the water had been residual water from the July leak. At B Reactor, all process tubes were tested when collection rates remained high subsequent to correcting a tube leak detected earlier in the month after testing four tubes. The test program revealed six leaking tubes, four with Van Stone flange leaks, and two with tube wall leaks. At F Reactor, a process tube leak was found in conjunction with a slug rupture. The two programs required approximately 40 and 65 outage hours at B and C Reactors, respectively.

Examination of the B Reactor downcomer during an August outage revealed several cracks in the downcomer near the top supporting band. The cracks were repaired by welding, and a steel collar with bracing was installed below the band to relieve the strain at this point.

During August the tritium input production was 125 percent of forecast. The high production was mainly due to the high time operating efficiency of the DR Reactor which was 99.8 percent. Only two J-N tubes were discharged during August, and these were due to J slug ruptures. Input production devoted to the program was 50.1 percent and 3.6 percent at DR and C Reactors, respectively.

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REACTOR SECTION (Continued)

The thorium irradiation program increased significantly as the result of the initial charging of an approximate total requirement of 400 tubes. A total of 268 tubes were charged, 120 tubes at the C Reactor and 148 tubes at H. Twelve tubes of the original production test material remain in H pile. The input production of the thorium program was 3.5 and 2.7 percent to the total production for the month at the C and H Reactors.

SEPARATIONS SECTION

The total production of Redox and T plants for the month was 76 percent of the forecast with that of the individual plants being 69 and 128 percent, respectively. T plant production was entirely low g/t plutonium.

The Redox plant operation was affected during the month by equipment failures and flushes to improve decontamination performance. A total of five days of production time starting August 8 were lost while the H-2 centrifuge, the E-12 agitator and 1 AF feed pump were replaced. On August 15 a flush was made of the 1A column because of poor decontamination. After the column resumed operation no improvement was noted, and on August 16 a flush was started on all of the extraction columns and the head-end equipment. Operations were resumed on August 20 and continued to the month end except for a 24 hour shutdown to replace the D-8 salt waste neutralizing tank agitator. The total outage time for the month was 277 hours, of which 95 hours were for flushing purposes. Poor decontamination of the uranium stream continued throughout the month. At month end no direct cause of this operating condition had been determined even after intensive study of the flowsheet. Most of the uranium product was processed through the silica gel filter with some 72 tons being sent to TBP for reprocessing.

T plant operation was essentially normal during the month. A third dissolver was activated on August 17, increasing the metal solution capacity.

The TBP plant production was 149 percent of the official forecast with parallel operation continuing throughout the month. Both the A and B lines operated continuously except for a two day shutdown for flushing of the A line and the removal of organic accumulation from the RA feed tank. Waste losses and decontamination were very satisfactory during the month.

The UO_3 production was 114 percent of the forecast. Production rates were lower than normal because only uranium from the TBP plant was available for processing. Intermittent foaming was experienced throughout the month, but continuity of operation was not affected.

The 234-5 production of shapes was 83 and 77 percent of that forecast for the large and small types respectively. One hundred percent of buttons for shipment were produced during August and the nitrate for offsite shipment was produced. The lower than forecast production was due principally to rescheduling problems involved with a change in Commission requirements. Operation of the building was resumed on August 16 after decontamination of the area behind the RMA line, which was grossly contaminated during the Metal turnings fire on July 27. At month end 95.4 percent of the material involved in the incident had been recovered.

SEPARATIONS SECTION (Continued)

The waste evaporators were operated throughout the month with volume reductions of 42 percent for B and 29.7 percent for T.

Metal Waste removal continued satisfactorily during the month with average rates of eight tons per day being achieved even though two Nagle pumps failed in the East Area. Late in the month sluicing was started in the 107-TX tank on an experimental basis to determine whether the 2.5 year old material can be processed in parallel operation. Evaluation of this in TBP has not yet been made.

The Tritium Extraction Line completed its program early in August after having produced 109 percent of its quarterly forecast production. The line was shut down August 6 and placed in a Standby condition as requested by the Commission.

GENERAL

The resignation of J. H. Black, Plant Mechanical Engineer, Plant Engineering Section was accepted and became effective July 30, 1954.

Personnel

Total on Roll August 1, 1954	3585
Accessions	76*
Separations	22*
Total on Roll August 31, 1954	3639

*Does not include intra-department transfers.



J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

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DECLASSIFIEDMANUFACTURING DEPARTMENTPATENT REPORT SUMMARY
FOR
MONTH OF AUGUST, 1954

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

<u>INVENTOR</u>	<u>INVENTION</u>
A. F. Cranmer, Reactor Section	"Use of Tublar Dummies In Place of Perforated Dummies"
C. E. Frantz, Metal Preparation Section	"Can Expanding Press"

J. E. Marder
J. E. MARDER, MANAGER
MANUFACTURING DEPARTMENT

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MONTHLY OPERATING REPORT
AUGUST 1954

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1954

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION

September 7, 1954

August, 1954

I. RESPONSIBILITY

There were no changes in responsibility during this period.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	<u>August</u>	<u>July</u>	<u>Year to Date</u>
Acceptable Pieces Canned (8") (Tons) Gross	324	260	1825
Acceptable Pieces Canned (8") (Tons) Net	318	259	1808
Canning Yield (8") (%)	81.4	81.3	80.0
Total Acceptable Pieces Canned (Tons) Gross	324	268	1955
Total Acceptable Pieces Canned (Tons) Net	318	267	1934
Acceptable Pieces Canned (% of Forecast)	101	91	93
Autoclave Frequency (8") (No./M)	.00	.01	.01
J-3 Slugs Canned (pieces)	0	0	35964
N Slugs Canned (pieces)	0	0	33177
Chem. 10-66 Canned (pieces)	2696	4086	8895
Special Request (man hours)	1135	690	5242
305 Routine Tests (man hours)	198	206	2857
305 Special Tests (man hours)	479	491	7051
Average Steam Generated (M lbs/hr)	23.7	18.9	
Maximum Steam Generated (M lbs/hr)	53.0	29.0	
Total Steam Generated (M lbs)	17,500	14,100	
Coal Consumed (Tons)	1155	866	
Sanitary Water from 3000 Area (Million gals.)	61.0	50.7	
Total Water from 3000 Area Average Rate (GPM)	1367	1137	

Note: Inasmuch as canning of four-inch material on a production basis has been completed, these statistics have been deleted. Any future four-inch production will be shown as a special product.

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GENERAL INVESTIGATIVE
DIVISION

2. Activities

The net production of acceptable normal uranium slugs reached a new high of 318 tons for the month. There was no significant change in canning yield from the previous month. The fifth canning line was put into operation on August 23 and all lines operated with relief throughout the month.

Salt bath heat treating of untransformed slugs on a production basis started on August 20. At month-end these slugs were being canned by the lead dip method with no unusual difficulties.

The Zyglo bare slug inspection operation was discontinued on August 27. After two months' experience with the Zyglo inspection, it was concluded that this method did not reveal defects that would not be detected by inspection after pickling. Some types of imperfections were passed by Zyglo and then detected at pickle inspection.

One autoclave failure of thorium material occurred. This failure was attributed to a faulty slug core.

Agreement was reached with the A.E.C. and the National Lead Company of Ohio to adopt the Hanford Slug Inspection Standards at Fernald effective August 27. This is expected to result in significant improvement of bare slug quality of material received at Hanford and consequently reduce the amount of bare reject material returned to Fernald with appreciable reduction in shipping costs.

3. Special Operations

There were 2,696 thorium slugs canned during the month. This completes the needs of the present program with the exception of 300 pieces which are to be hot press canned. Several hundred reject canned pieces are being held by the Technical Section for special tests and will be recanned at a later date.

4. Schedule Variance

Canned slug production was 101% of forecast.

B. Equipment Experience

1. Operating Continuity

The canning lines operated at a 93% efficiency, an improvement of one percent over the previous month.

Severe production disturbances caused by instrument and thermocouple difficulties in the 303 Area were reported during the month. This is attributable to thermocouple drift, erratic standardization of the recorder on the induction furnace and difficulty in setting up the temperature calibration on the canning pot for the third line. Steps were taken to reduce production outages.

At 9:00 a.m. on August 12, the crated load of a transportation truck caught the 110-220 volt lighting service east of the 314 Building. Two poles were broken off and tipped in E3S5 substation, severing the service to the adjacent Maintenance building. Although no other interruptions occurred, lighting to 314 and the 313 canning area was threatened. Electrical Distribution made temporary repairs two hours later. No injuries occurred as a result of the near-serious incident.

DEL

2. Inspection, Maintenance and Replacements

The first of the new automatic facing lathes was tested with good results. One semi-automatic welder was accepted and used all month. Performance of the machine was very good. One of the new induction furnaces was accepted and is being run in.

An additional dryer for steel sleeves was fabricated and installed in the component parts preparation facilities to provide sufficient capacity for the fifth canning line. Two salt bath agitators were fabricated and installed in the 313 Building for the heat treatment of bare slugs. A new type of ultrasonic testing device known as sono-bond was installed for evaluation. If satisfactory, this equipment will replace the frost test machine for the determination of bond quality.

A two-man balance crew has been initiated for laboratory area ventilation. This crew will check the air flow and air balance in the 325, 326, 327 and 329 Buildings. Instruments have been ordered and the crew should be operating by October 1.

The nitric acid fractionator for the 321 Building was completed and assembled. The unit consisted of tower, reboiler and condenser. The pulse generator from the HA Column of the Purex Hot Semiworks was installed in 321 Building for test and adjustment.

C. Improvement Experience

1. Production Tests

PT-313-38MT "Canning of Cored Uranium Slugs" (HW-31900)
Four hundred seventy-two four-inch cored slugs were canned by the lead dip method with no unusual incidents. Future plans include canning up to several thousand cored slugs per month.

PT-313-39MT "Canning of Several Thousand Uranium Powder Metal Compact Slugs" (HW-31955)
Seven hundred sixty-four recovered powder compact slugs were canned without difficulty.

2. Process Tests and Revisions

An estimated savings of \$1500 per month will be realized due to the conversion to honing from peening as a method for reclaiming steel sleeves.

A savings of approximately \$8,000 to date in 1954 has been realized from a number of can processing improvements which have been established in recent months. This includes returning reject cans to vendor for credit, reprocessing rather than discarding cans not used within four hours after preparation, and improved handling procedures during processing which have resulted in fewer rejects.

The use of Neoprene glove protectors at the facing and marking fluoroscope operations will save \$1600 annually through better utilization of gloves.

Pickle inspection and reactivity data continue to show that metal from pickled derbies is consistently of a higher quality than metal from unpickled derbies.

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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 except the following:

C. E. Frantz "Can Expanding Press"

D. Events Influencing Costs

1. Labor Variance

Increased labor productivity resulted in a decrease of about .005 per unit for direct labor.

2. Material Variance

Material costs remained essentially unchanged from the previous month.

3. Other

Although maintenance costs are expected to increase slightly due to work on salt bath heat treating equipment, the over-all I.M.E. unit cost will decrease approximately .02 per unit as a result of an increase in production.

E. Plant Expansion

1. Project Status

Project CA-514 - "Expansion of 300 Area Production Facilities"

Design of the overall project is 98% complete and construction 58% complete. The total funds authorized for this project remain at \$5,085,000. Project costs to date including commitments are approximately \$3,650,000. Directive completion date is March 1, 1955.

Work on the Manufacturing offices and building alterations in 3707-A, 3707-B, and 3706 Buildings is 25% complete. The lunchroom facilities in 3707-A have been installed, air ducts have been fabricated and installed and finish carpentry is in progress.

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

Scoping of 3X facilities is complete, detailed design complete and construction 98% complete. Project authorized funds total \$860,000 and the current estimate for completion is \$862,000. Total costs plus commitments are \$832,493 as of August 15, 1954.

Facilities provided under this project were accepted by the Manufacturing Department on August 23 with some minor exceptions.

2. Plant Engineering

The McNeil Building has been removed from the Area and arrangements are being made to clean up the site. Fills have been made in sites where hutments were removed.

The bumper logs, railings and signs have been taken up from the former West side parking lot and the lot has been leveled.

2. Plant Engineering (continued)

Barrel storage for the 321 Building was moved and the old platform removed.

F. Significant Reports Issued1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-32606	Monthly Report, Process Sub-section, Metal Preparation Section, July 1954	EW O'Rorke	8-2-54

2. Non-Routine

HW-32370	Reliability of SF Weight of Transfers to 100 Area	EW O'Rorke	7-8-54
HW-32636	Identification of Slug Cores from 7" Ingots and Various Heat Treating Processes	SM Gill	8-3-54
HW-32742	Suggestion for Production Test to Can Uranium Slugs by a Long Preheat-Short Submerge Canning Method	JE Gackle	8-13-54
HW-32743	Use of Reclaimed AlSi in the Lead Dip Canning Process	JE Gackle	8-13-54
HW-32852	Uranium Slug Quality Control, Trip Report, FMPC, August 9-13, 1954	SM Gill	8-25-54

III. PERSONNELA. Organization

No change.

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	2	0
Operations	182	188	+6
Power & Maintenance	301	310	+9
Process	83	86	+3
Projects & Personnel Development	9	10	+1
Section Total	577	596	+19

C. Safety Experience

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

D. Radiation Experience

Two exposures in excess of 300 mrad and eight exposures in excess of 200 mrad per week were reported during the month. All exposures were encountered in the Zyglo inspection. This operation has been discontinued.

A gradual improvement has been noted in the degree of contamination found in most jobs and work areas.

E. Personnel Activities**1. Visits and Visitors**

S.M. Gill visited the National Lead Company of Ohio at Fernald to discuss uranium slug quality control and the Mallinckrodt Chemical Works at St. Louis, Missouri to make a survey on uranium processing.

E.W. O'Rourke visited Alcoa at Edgewater, New Jersey to discuss quality improvements for aluminum components.

C.E. Frantz visited vendors in Tacoma, Washington to discuss details of equipment for the 313 Building.

2. Meetings

In an effort to develop better and safer fork truck operators, a fork truck roadso was held. This was in addition to the regular safety meeting. An obstacle course was set up and as each operator drove through the course, he was rated on ability and safety attitude. It is planned to hold similar meetings in the future.

S.M. Gill spoke on "Recent Developments in Uranium Fabrication Methods" at a meeting attended by members of Process, Projects and Personnel Development, and Operations Sub-sections.

Round table discussions were held with all supervisory members of the Operations Sub-section.

An information meeting for Operations supervision concerning the operation of the Ajax induction furnace was conducted by Mr. Tom Hull of the Ajax Engineering Company.

An information meeting covering radiation hazards in the 300 Area and the proper wearing of badges and pencils was held for secretaries and clerical personnel of the Section.

Eight exempt members of the Section attended supervisory training courses.

Richland, Washington
September 8, 1954

MANUFACTURING DEPARTMENT
REACTOR SECTION
AUGUST, 1954

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

August total reactor input production established a new record high for the second consecutive month, exceeding the July record by 0.8 percent primarily because of a slightly improved time operated efficiency, 87.4 percent as compared to 87.1 percent in July. Plutonium input production, although 112.2 percent of forecast, was only 98.5 percent of the July production, because greater amounts of input production at C and H Reactors were devoted to special programs.

August plutonium output production was 186.9 percent of forecast although only 96.1 percent of the July output. Discharges of approximately 190 and 100 tons of low and other concentration material respectively were 92.0 and 448.5 percent of forecast. The significantly higher than forecast production of other concentration material resulted from the discharge in August of four-inch material at B, D, and F Reactors at a lower (base goal plus 25 megawatt days) than scheduled (base goal plus 75 megawatt days) concentration in order to minimize the slug rupture frequency. As in July, goal concentration for other than low concentration material continued to be 75 megawatt days above base goal.

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A. Operating Experience (Continued)

August Mint production was 125.1 percent of forecast, and 115.1 percent of July production as the result of an exceptionally high, 99.8 percent, time operated efficiency at DR Reactor. Only two J-N tubes, both at DR Reactor, and both containing "J" ruptures, were discharged during August. Input production devoted to the Mint program was 50.1 and 3.6 percent at DR and C Reactors, respectively.

J-Q production increased significantly during August as the result of the initial charging for an approximate 400 tube J-Q program. A total of 268 tubes were charged, 120 at C Reactor and 148 tubes at H Reactor. Production was 821.0 percent of forecast as a result of charging tubes at a higher rate than forecast. The J-Q test program at H Reactor continued without incident. One concentration monitoring tube was discharged, leaving 12 of the original J-Q tubes in the reactor. Input production devoted to the J-Q program was 3.5 and 2.7 percent at C and H Reactors, respectively.

There were no increases in established maximum operating levels of the reactors, and all operated at essentially the same or slightly lower levels, as compared to July, as the result of increased river temperatures.

A total of six slugs failed at all reactors during August. Distribution by reactor and type is tabulated below:

	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total</u>
Regular eight-inch	1				1		2
J material				2			2
C material		*2					2
Totals	1	2	0	2	1	0	6

* One "C" material rupture is a suspect which has not been confirmed.

The total outage time resulting from these ruptures was approximately 115 hours. Three of the ruptures were pushed during minimum scram recovery time using quickie equipment.

1. Statistics

	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total or Average</u>
Reactor Time Operated							
Efficiency (%)	75.1	81.0	91.9	99.8	89.0	87.7	87.4
Reactor Outage Time (Hrs)							
Plutonium Production	184.9	104.7	49.4	0.3	78.3	38.1	455.7
Special Irradiations and Tests	0.7	37.0	10.7	1.1	3.7	53.6	106.8
Total	185.6	141.7	60.1	1.4	82.0	91.7	562.5
Reactor Unscheduled							
Outage Time (Hrs)	74.0	99.0	0.7	1.4	35.8	3.0	213.9
Metal Discharged (Tons)	29.6	167.4	20.4	--	36.8	31.3	285.0
Water Quality (ppm Iron)							
Raw Water - Average	0.10	0.11	0.07	0.09	0.08	0.10	--
Raw Water - Maximum	0.19	0.17	0.10	0.12	0.10	0.14	--
Process Water - Average	0.011	0.008	0.010	0.007	0.010	0.010	--

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A. Operating Experience

1. Statistics (Continued)

	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total or Average</u>
Process Water - Maximum Water Pumped (MM Gals)	0.017	0.019	0.024	0.020	0.030	0.020	--
Bldg. 190 to reactor	1817	3411	2045	1902	1893	2156	13224
Bldg. 182 to 200 Areas	257		100			77	434
Bldg. 181	6011		4758		2293	2565	15627
Steam Generated (MM Lbs)	143		230		134	106	613
Coal Consumed (Tons)	8723		14501		7647	6761	37632

2. Activities

Operation was limited by a 95 C process tube outlet water temperature at C, D, DR, F and H Reactors, and 100 C at B Reactor as authorized by Process Test MR-105-21, "Allowing B Reactor Operation on Trip-Before-Boiling Limits".

Water treatment experience improved during August as compared with July as the result of improved raw water quality. The addition of activated silica was discontinued at B, F, and H water plants during the early part of the month. Addition at C, D and DR water plants had been discontinued in July.

Shipment of irradiated "J" slugs by motor truck from DR Reactor to Arco, Idaho, was suspended for the first two weeks of August to accommodate truck maintenance and driver vacations. Shipping was resumed during the last half of the month, with 20 casks containing approximately 1300 pieces shipped.

Receipt of coal shipments was resumed August 2, following a four-week miners' "holiday" and the awarding of new contracts.

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

	<u>Tubes Charged</u>	<u>Tubes Discharged</u>	<u>Casks Shipped</u>
Chemical 10-66	12	15	0
Production Tests	18	25	0
Total	30	40	0

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During August, 22 reactor scrams occurred. Of these, 14 were caused by normal Panellit system difficulties at all reactors. Three scrams at H Reactor were caused by recirculation tube 0961-H (PT 105-506-E, "Recirculation Studies"), one as the result of pressure buildup in the system during a controlled rise in coolant temperature, and two as the result of controlled boiling tests. C Reactor was scrambled by under voltage which resulted when a steam syphon line solenoid burned out. Unexplained electrical Beckman trips caused scrams at B and DR Reactors. D Reactor was scrambled once through the inter-tie system, because of the DR Reactor Beckman scram, and again because of a Panellit trip resulting from a plugged cone screen. Total outage time charged to these scrams was 10.8 hours.

Two major process tube leak testing programs occurred in August. At C Reactor, based upon high water collection rates which continued after the July tube leak was corrected, all process tubes, horizontal rods and the thermal shield loop were tested without locating a leak. Operation was resumed and collection rates returned to normal approximately 12 days later indicating that several minor leaks were corrected or that the water had been residual water from the July leak. At B Reactor, all process tubes were tested when collection rates remained high subsequent to correcting a tube leak detected earlier in the month after testing four tubes. The test program revealed six leaking tubes, four with Van Stone flange leaks, and two with tube wall leaks. At F Reactor, a process tube leak was found in conjunction with a slug rupture. The two major programs required approximately 40 and 65 outage hours at B and C Reactors, respectively.

Horizontal rod operating experience continued to be good during August with only one rod thimble, A at F Reactor, requiring replacement. A flexible half rod of the new oval design which requires no thimble was installed in No. 8 channel at F Reactor. All horizontal rods at C and B Reactors were tested for leaks, with no leaks found. Several rods at C Reactor required flushing out to remove sediment accumulations resulting from normal film and corrosion buildup, and restore flow to normal. No. 9 was flushed out and returned to service, while Nos. 3, 15, and 18 were removed from service to be flushed during the next outage together with Nos. 1, 6, and 13 which are beginning to show a reduced flow. At D Reactor, No. 5 rod, which had been binding when approximately half way into the reactor, was found to stick tight when the reactor is cold. No unusual conditions were found when the rod was leak tested and the thimble visually examined, and the rod continued in limited service at month end.

Examination of the B Reactor downcomer during an August outage revealed several cracks in the downcomer near the top supporting band. The cracks were repaired by welding, and a steel collar with bracing was installed below the band to relieve the strain at this point.

No. 6 process water pump turbine in Building 190-B was removed from service due to excessive vibration. Inspection revealed that a section of the rotating blading had been sheared from the rotor. A replacement element was obtained, and the pump unit was returned to service by month end.

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B. Equipment Experience (Continued)

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

Meetings were held during August between representatives of the Plant Engineering Section and the Maintenance and Power Sub-Sections to discuss the overload problem on Building 190-C 3500 hp pump motors which has resulted in higher than normal winding temperatures during July and August. It is planned to investigate the problem through studies of the system voltage, transformer tap settings and motor cooling systems.

C. Improvement Experience

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

- PT-105-4-MR (Poison Column Control Facility)
Suppl. C Use of this facility at DR Reactor resulted in an approximate 750 megawatt day production gain in August when discharge of three facility tubes of poison permitted recovery from a rupture discharge operation which exceeded the scram recovery time provided by the control rods alone.
- PT-105-7-MR (Irradiation of High Quality Production Uranium Slugs)
Ten tubes of material were charged at H Reactor under this test. The slugs represent the best available regular production uranium cores on the basis of more rigid than normal inspections. It is planned to irradiate this material until a total of six slug jacket failures occur to determine information on reactor performance of high quality material.
- PT-105-8-MR (Uranium Charging During Reactor Operation)
Four tubes of eight-inch metal were charge-discharged without incident during operation at B Reactor in August for a total of seven tubes to date.
- PT-105-539-E (Slug Exposure at a Concentration of 900 MWD/Ton)
At H Reactor in August, 149 tubes were charged with triple dipped slugs and 150 tubes were charged with lead dipped slugs for irradiation to concentrations of 900 megawatt days per ton as part of the continuing program to investigate slug rupture frequencies at higher concentrations.
- PT-105-506-E (Recirculation Studies)
The revised loop for recirculation tube 0961-H, incorporating extensive flow, pressure and control revisions, was returned to service in August. Three reactor scrams were caused by this test facility as described under "Equipment Experience".
- PT-105-562-A (Slug Evaluation at Increased Levels for Tritium Production)
This test continued without incident. No additional tubes were discharged in August. Forty J-N columns remain in C Reactor.

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C. Improvement Experience (Continued)

PT-105-579-A (Quantity Irradiation of J-Q Columns)
 The 268 tubes of J-Q material, which were charged at C and H Reactors as described in "Operating Experience", were charged under this test. Approximately 400 tubes are scheduled for the complete program.

Six revised Process Standards - Reactor were approved and issued during August. These were standards titled: "Pressure and Flow During Reactor Shutdown", "Unirradiated Metal Slug Inspection and Storage", "Make-Up of Special Irradiation Tube Charges", "Number of Inoperable Rods and Ball 3X Hoppers During Reactor Operation", "Limitations of Rod Out of Reactor During Shutdown", and "Earthquake - Seismoscope Operation". The most significant changes involved: 1. Relaxing of metal inspection requirements for reactors where the entire loading will be taken to low goal concentrations; 2. Increasing the number of vertical and horizontal rods that are permitted to be out of service during operation to minimize the possibility of production losses due to inoperable rods; and 3. Stipulation of rod and poison column strength required to maintain a reactor below critical under varying conditions such as loss of water.

Work is continuing on the B and C Reactor and D and DR Reactor inter-ties design changes which will make it necessary that two, rather than one, Beckmans be tripped at one reactor in order to scram the other reactor through the inter-tie system.

The report of invention indicated below was submitted during August:

<u>Inventor</u>	<u>Invention</u>
A. F. Crammer	Use of Tubular Dummies In Place of Perforated Dummies

This proposal was submitted originally through the suggestion system as Suggestion No. 7043, dated 7-24-51. An invention report was previously submitted in May on this same subject.

D. Events Influencing Costs

Reactor maintenance costs were adversely affected in August by the increased amount of work involved in the two major leak testing programs at B and C Reactors as described in "Equipment Experience". Horizontal rod work remained approximately the same as in July. Maintenance work associated with ruptured slug removal continued to decrease with beneficial effects on reactor maintenance costs.

Improved raw water quality and revised coal billing rates based on new contracts were primarily responsible for an approximate \$37,000 or nine percent decrease in total applied Power material costs in August. Specifically, filter plant chemical costs decreased approximately \$19,000 or 38 percent while coal and HAPO freight decreased approximately \$16,500 or five percent. Total steam generated and process water flow both increased 0.6 percent.

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D. Events Influencing Costs (Continued)

Both plutonium irradiation and total irradiation unit costs are expected to be essentially the same as in July. Some slight increase in plutonium irradiation unit costs may be expected as the result of a 1.5 percent decrease in plutonium production, and the adverse effect of increased leak testing, although their influence will be diminished by the beneficial effect of lower applied material costs. Total irradiation unit costs may be expected to decrease slightly as the result of an increase of 0.8 percent in total production.

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

E. Plant Development and Expansion

1. Project Status

The most significant Reactor Section project activity is reported below. Further details concerning projects may be found in the report, "Status of Reactor Section Projects, Informal Requests and Budget Items", F. A. R. Stainken to J. H. Warren, dated 8-19-54.

CA-512 (100-K Facilities)

Construction completion percentages for the K Reactors and Water Plants estimated by the AEC as of August 13 are:

Overall	90	KW Water Plant	98
KW Reactor	96	KE Water Plant	86
KE Reactor	79	General Facilities	87

At KW Reactor, all major structural and architectural work has been completed throughout the building as well as equipment installation. Work continues on final phases of piping and wiring. At KE Reactor, placing of the top biological shield aggregate concrete has been completed, and the skin plate is being assembled.

The Expansion Liaison Unit of the Reactor Section has completed preliminary discussions with personnel of the Safety, Engineering, and Manufacturing Departments regarding the temporary design changes required in Building 190-KW for protection of personnel and equipment during the operation of the presently installed pumps with defective casings as described in the July report.

CA-431 (100-C Plant)

The C Reactor effluent system was accepted by operating forces on July 30, upon completion of the Building 105-B effluent vent system. Alterations to the 107-C East Basin have been scheduled for December, 1954, in conjunction with work under Project

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E. Plant Development and Expansion (Continued)

CA-431 (100-C Plant)

CG-558. The Reynolds Aluminum Company has been having difficulty making a satisfactory horizontal rod extrusion, and are reworking their second die. The contract for horizontal rod gas seals has been awarded to the Continental Rubber Works of Erie, Pennsylvania.

CG-558 (Reactor Plant Modification for Improved Production)

Scope design is estimated to be 83.7 percent complete. Re-writing of the project proposal for this project continues. Included will be full modifications at 100-B, D, DR, F and H Areas, with installation of the poison column control facility at F Reactor. Procurement and construction funds are authorized for all areas except 100-F and H Areas. Construction work began on the removal and lowering of weir caps and enlarging of the effluent opening at the 107-B Retention Basin, and preparation of new foundation locations adjacent to Building 190-DR.

RDS-D-10) (Reactor and Water Plant Design Development)
RDS-D-11)

Document HW-32706 issued by the Design Sub-Section contains an evaluation of the degree of hazard involved in the failure of the steam supply for the turbine driven pumps prior to CG-558 alterations in the various Buildings 190. The document lists exit water temperature limitations which would preclude boiling in the reactors.

Preliminary scope material for auxiliary reactor cooling systems is being prepared by the Design Sub-Section for release in the near future. This material is based upon document HW-32268, "Disaster Safety Systems for the Hanford Reactors Auxiliary Water Supply", with an alternate plan considered.

Engineering Department analyses of the economic, mechanical and hydraulic aspects of dual purpose reactor plants of various capacities, and the possibility of conversion to single purpose plants are continuing. The target date for issuance of a report on the third concept study is mid-October.

2. Plant Engineering

A number of engineering and development studies were active in the Section during August. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in document HW-32944. Several items of interest are reported below.

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2. Plant Engineering (Continued)

A survey conducted to determine the advisability of replacing burned-out graphite stringer thermocouples, as described in the July report, revealed that 20 percent of the central position chromel-alumel couples are inoperable, and that the failure mechanism is probably in-pile rather than of an external circuit type since only 12 percent of the fringe couples have failed. It was recommended that cost of replacement be further investigated, and that a couple of improved life, reliability and ease of replacement be developed.

As a solution to the hot startup problem of detecting regions of the reactor in which outlet water temperatures exceed limits, the feasibility of installing thermally operated switches in several rear nozzles located at appropriate positions is being investigated. These switches would actuate an annunciator or the reactor safety circuit whenever the effluent water temperature from one of these tubes reached a preset point, and thus minimize local power surges.

Progress on noise studies in August included the taking of noise level readings in the bays between Nos. 10 and 11 pump foundations at Building 190-C subsequent to installation of Ultra-Coustic material. Curves are being prepared for presentation of before and after conditions. The partial shroud at Building 190-H was completed, and noise level tests are planned for the next scheduled reactor outage.

Photographing of fire and firebed conditions was resumed in August in an attempt to secure a clearer view of the "envelope effect" surrounding coal particles which has been noted previously. In addition, work progressed on Supplement No. 2 to the "Coal Utilization Standards Study" which is scheduled for publication in the near future.

F. Significant Reports

1. Routine

Monthly operating reports for July were:

HW-32624-A	Reactor Section	JH Warren	8-6-54
HW-32739	Operations Sub-Section	RO Mehann	8-1-54
HW-32625	Process Sub-Section	OC Schroeder	8-1-54
HW-32602	Projects & Personnel Practices Sub-Section	FAR Stainken	8-2-54
HW-32659	Radiation Monitoring Sub-Section	PC Jerman	8-4-54
--	Maintenance Sub-Section	EE Weyerts	8-4-54
HW-32649	Power Sub-Section	JC McLaughlin	8-4-54

Other routine reports issued during August included:

HW-32830	"Monthly Progress Report, Reactor Section Expansion, August, 1954"	HT Wells	8-24-54
--	"Status of Reactor Section Projects, Informal Requests, and Budget Items"	FAR Stainken	8-19-54
HW-32645	"Reactivity Balance and Associated Data - Period June and July, 1954"	AP Vinther	8-2-54

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F. Significant Reports (Continued)2. Non-Routine

HW-32163	"Production Test 105-7-MR, Irradiation of High Quality Production Uranium Slugs"	GB Coover	6-17-54
HW-32498	"Process Test MR-105-22, Supplement A, Installation of Crossheader Orifices"	AK Hardin	7-20-54
HW-32617	"Interim Report, Process Test MR-105-22, Installation of Crossheader Orifices"	AK Hardin	8-2-54
HW-32353	"Final Report, Process Test MR-105-8 and Process Test MR-105-8, Supplement A, Discharge of Ruptured Slugs Within Allowable Scram Recovery Time"	GO Amy	7-9-54
HW-32793	"Reactor Section Requirements for CG-574, Hanford IX Program, and CG-599, Hanford 4X Program - 100 Areas"	RJ Bursey	8-18-54
HW-32839	"Storage Basin Bucket Requirements - 100 Areas"	TH Lyons	8-23-54
HW-32735	"Build-Up on Metallic Surfaces Through Use of Silicone Release Agents"	R Willing JS Corbett	8-12-54
Confidential Undocumented	"Poison Requirements of the Hanford Reactors During the Horizontal Replacement Program of CG-558"	AP Vinther	7-30-54
Confidential Undocumented	"Power Level Monitoring - Beckmans"	OC Schroeder	8-2-54
—	"Reactor Section Procedure for Processing Suggestions"	JH Warren	8-26-54

III. PERSONNELA. Organization

The tentative name of the Projects and Personnel Practices Sub-Section used in last months' report was firmed up during August as the Projects and Personnel Development Sub-Section. Similarly, the Personnel Practices Unit now is the Personnel Development Unit.

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

B. Force Summary

	<u>Beginning of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	2	0
Operations	324	331	+ 7
Maintenance	514	526	+ 12
Projects & Personnel Development	32	34	+ 2
Power	449	455	+ 6
Process	58	58	0
Radiation Monitoring	72	76	+ 4
Section Total	1451	1482	+ 31

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HW-32889

B. Force Summary (Continued)

Changes during August included 18 transfers into the Section, two transfers out of the Section, 13 new hires, one termination, five reactivations and two deactivations. Reactor Section force increases were the result of the addition of manpower to staff K Area.

C. Safety Experience

There were no Major or Sub-Major Injuries in the Reactor Section during August. There was one Near-Serious Accident, No. 54-20 which occurred at 100-B Area on August 28, and involved an explosion of a 100 psi pressure gage on the carbon-dioxide system. This gage had not been taken off the system prior to using the system for piping high pressure gas at approximately 2800 psi. A Maintenance Sub-Section employee received face lacerations from flying glass. He was wearing safety glasses.

During August, the program of providing ear protection for those employees required to wear this equipment was completed.

D. Radiation Experience

There were three Class I and no Class II Radiation Incidents in the Reactor Section during August. Incident No. 378 occurred at B Reactor on August 5, when two Operations Sub-Section employees received radiation exposure in excess of that planned as a result of an unanticipated rise in radiation level during the installation of quickie discharge equipment, apparently due to fission product being washed out of the tube when the nozzle cap was loosened. Details of this incident are reported in HW-32768.

Incidents Nos. 381 and 382 both occurred at H Reactor on August 30, and in both cases involved radiation exposure to personnel in excess of that planned. No. 381 involved exposures received by two Pile Technology Sub-Section employees during the removal of samples from a test assembly as the result of inadequate monitoring and removal procedures. No. 382 involved exposures received by several Reactor Section employees as a result of clothing contamination due to contaminated water which was splashed during removal of up-stream dummies from a process tube. Details of these incidents are reported in HW-32992 and HW-32993, respectively.

As part of the program to determine if the ground contamination within 100-B Area is fixed, a mass shoe check was made on approximately 250 employees at the end of the day shift on August 31. A radioactive particle which read 8,000 c/m was found on the sole of one shoe. Surveys made periodically throughout the month of ten ground plots established at various locations indicated little if any significant movement of particles.

E. Personnel Activities

At month end, 11 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; nine of these are on assignment under the rotational training program.

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E. Personnel Activities (Continued)

Principal item of interest during August in regard to employee communications was the scheduling of a series of 11 meetings conducted by representatives of the Union Relations Section to explain changes in the HAMTC and other contracts to Reactor Section exempt personnel. Approximately 140 people attended these meetings.

No trips were taken by Reactor Section personnel during August.

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Richland, Washington
September 7, 1954

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
AUGUST, 1954

I RESPONSIBILITY

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

II ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	<u>August</u>		<u>July</u>	
	<u>Normal</u>	<u>Acid Wash</u>	<u>Normal</u>	<u>Acid Wash</u>
Charges started in Canyon Bldgs.	58	2	61	2
Charges completed in Conc. Bldgs.	51	4	61	2
Special charges-Conc. Bldgs.	6		5	
Charges completed-Isolation Bldg.	266		191	
Average Waste Losses, %	2.7		2.6	
Special charges-Isolation Bldg.	55		33	
Material balance, %	101.8		101.9	
Yield through Process, %	99.1		99.3	
Average cooling time (days)	96		98	
Minimum cooling time (days)	70		74	

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Separations Section

b. Redox Operations

	<u>August</u>	<u>July</u>
Equivalent charges started	182.2	141.5*
Charges completed	188.9	138.5
Tons Uranium delivered to storage	111.8	69.0
Average Production Rate per operating day, Tons	5.7	5.2
Average Daily Operating Rate for the month, Tons	3.6	2.2
Average yield, %		
Uranium	97.6	97.0
Plutonium	100.9	100.6
Total Waste Loss, %		
Uranium	1.43	0.47
Plutonium	0.84	0.73
Average cooling time, days	109	106
Minimum cooling time, days	82	76
Percent down time	37.0	57.1

*Corrected figure.

c. 234-5 Operations

	<u>August</u>	<u>July</u>
Batches completed through Task II.	128	62
Runs completed through Task III	117	58
Reduction yield, RM	98.5	97.5
Waste Disposal, units	4.34	1.32

d. UO₃ Operations

	<u>August</u>	<u>July</u>	<u>To Date</u>
Uranium drummed, Tons	318.87	189.29	7106.17
Uranium shipped, Tons	323.31	168.01	7063.47
Average cooling time, days (Redox)	112	170	
Minimum cooling time, days (Redox)	107	106	
Waste loss, %	0.03	0.23	

e. TBP Operations

	<u>August</u>	<u>July</u>	<u>To Date</u>
Tons received from Metal Removal	249.93	181.68	4410.08
Tons shipped to UO ₃ Plant	252.67	171.04	4255.91

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e. TBP Operations (Continued)

	<u>August</u>	<u>July</u>
Average Production Rate per operating day, Tons	8.43	9.06
Average Daily Operating Rate for the month, Tons	8.15	5.52
Average yield, %	100.57	95.1
Total Waste Loss, %	0.65	1.56
Ratio Waste Volume returned to Volume removed	1.12	1.22
Percent Down Time	3.31	39.0

f. Mint Operations

	<u>August</u>	<u>July</u>
Charges started	11	163
Vacuum Tanks Filled	8	101
Product Purity, %	89.6	92.6
Average Yield, %	100.8	100.6
Product loss to stack, liters	0.11	0.80

g. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped, gpm	1 400	8 155
Filtered water pumped, gpm	460	1 140
Steam generated, lbs/hr	29 100	163 848
Maximum steam generated, lbs/hr	44 000	216 000
Total steam generated, M lbs.	21 650	122 000
Coal consumed, tons (est.)	1 387	7 703

h. Waste Storage

	<u>Equivalent Tons U</u>	
	<u>August</u>	<u>July</u>
Metal Waste reserve storage capacity-T Plant	756	840
1st Cycle reserve storage capacity - T Plant	739	489
Metal Waste reserve storage capacity-B Plant	1 001	145
1st Cycle reserve storage capacity - B Plant	406	162
Redox Waste reserve storage capacity	1 412	1 476

2. Activities

a. Redox Processing

**

Redox operations were spasmodic during the month due to equipment problems and flushes to improve decontamination performance. Five production days were lost (8-6-54 through 8-11-54) while the H-2 centrifuge and several other pieces of equipment were replaced. On August 15, decontamination was so poor that a flush was made of the 1-A Column; but, since no improvement was evidenced, a complete flush of all extraction columns and Head-end equipment was started on the 16th. Operations were resumed on August 20 and continued through the end of the month except for a 24 hour shut-down for replacement of the D-8 Salt Waste Neutralizing Tank Agitator. At month-end, operations were on a 7 tons per day rate.

Poor decontamination of the uranium stream, continuing even after the over-all flush, necessitated the processing of the uranium product through the silica gel "Tail End" facility, and at month-end some material was being sent to TBP for blending with their normal feed. The decontamination problem was aggravated during the last of the month by the presence of U-237 which apparently was present as the result of the inadvertent shipment of insufficiently decayed irradiated metal to the Redox plant.

b. TBP Processing

Both "A" and "B" lines operated continuously during the month except for a short down time of "A" line to remove organic accumulation from the RA feed tank and line flush. Waste losses and decontamination performance were highly satisfactory for the month.

c. UO₃ Processing

Production rates were lower during the period because only uranium from the TBP Plant was available for processing. Foaming which fluctuated with the dibutyl phosphate content of the feed URE supplied by TBP Plant, was experienced throughout the month, but did not affect operating continuity.

d. Waste Metal Removal

Although two Nagle pumps failed in East Area and one sluice nozzle required replacement an average production rate of eight tons per day was achieved in waste removal operations. Clean-out activities continued in the West Area 101-TX tank until late in the month when sluicing of 107-TX tank was begun on an experimental basis to determine if the 2.5 year old material can be processed in parallel operation. Evaluation of this has not been completed yet. Final cleanout of tank 101-TX will be made concurrent with removal activities in tank 107-TX. Supernate blending continues at 241-CR on material transferred from the 241-EX area.

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e. T Plant Processing

Operations in T Plant were essentially normal with all metal processed being 215 MWD material except for 19.37 tons of special irradiated uranium of 200 MWD material. A third dissolver, 3-5L, was activated on August 17, increasing the metal solution capacity. Increased production through the extraction cycle now depends on the acquisition of a third extraction unit for which approval has been obtained.

f. Isolation and Metal Fabrication Processing

Isolation operations were normal and all off site shipping commitments for the month were met. The bulk of Redox material was processed as oxalate for domestic production since only 11 runs were needed to complete the nitrate commitment for high MWD metal. T Plant metal was processed as sample can production with the exception of 13 runs produced from special irradiated uranium of 200 MWD material initially produced as nitrate for neutron counting prior to reprocessing as oxalate.

Metal Fabrication operations were resumed on August 16 after successfully completing decontamination of the entire area at the rear of the RMA Line which was grossly contaminated on July 27 when metal turnings from Hood 200-A burned in the open. Castings with high 70-58 content were encountered after operations were resumed, but by month-end the material had been successfully blended into "in specification" material.

g. Mint Processing

Feed material for August consisted entirely of "N" material. All available feed material was processed through the plant and the facility was then placed on a standby basis. Ninety (90) special break-seal samples of product were taken for the Radiological Sciences Department prior to laying away the facility. Product yield for the month of August was 108.8% with an average product purity of 89.6%. The lower than normal purity for the month is the result of final clean-out of product dregs in the entire line.

3. Special Operationsa. Waste Evaporators

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

a. Waste Evaporators (Continued)

<u>Evaporator</u>	<u>Gallons Feed</u>	<u>Gallons Bottoms</u>	<u>Gallons Concentrate</u>	<u>% Volume Reduction</u>
242-B	424 188	246 125	178 063	42.0
242-T	445 000	313 000	132 000	29.7

b. Pu Recovery, 234-5

Normal recovery activities during the month were curtailed due to the processing of materials associated with the incident of 7-27-54. At month-end, 95.4% of the total material involved in this incident had been recovered.

c. UO₃ Powder Recovery

Approximately 131.6 pounds of uranium were recovered from ten filter bags by vacuum cleaning. This material was blended into the process steam via the bulk handling system.

4. Schedule Variance

Due to equipment and process difficulties encountered in the Redox plant, forecast commitments were not met for separated and fabricated plutonium. The TBP and UO₃ plants, however, substantially exceeded their forecasts.

Redox Plant production of separated plutonium was 69% of forecast while T Plant achievement was 128% of forecast. Total plutonium separated was 75% of forecast.

In the Metal Fabrication Building, production of Model 110 shapes was 83% of the commitment, and the production of Model 130 shapes was 77% of the commitment. One hundred percent of buttons for off-site shipment were produced during August.

Uranium recovery production exceeded forecast as the TBP Plant attained 149% and the UO₃ Plant 114% of forecast. A total of 10 carloads of UO₃ powder was shipped in August.

Mint Plant production also exceeded forecast as 108% of the commitment was produced.

B. Equipment Experience1. Operating Continuity

Redox down time totalled 277 hours for mechanical difficulties and for a complete building equipment flush.

Total down time for the TBP Plant was 49 hours for "A" line to remove organic accumulation from the RA feed tank.

DECLASSIFIED1. Operating Continuity (Continued)

Total down time for Isolation facility was 134 hours to complete cell maintenance work. Total down time for Metal Fabrication facility was 240 hours to complete decontamination of the area at the rear of the RMA Line.

2. Inspection, Maintenance and Replacementa. H-2 Centrifuge - Redox

The H-2 centrifuge failed on August 6, 1954. Evidence indicated that the plow had become jammed in the "in" position when it was used while the bowl was rotating in reverse. About ten days prior to this date, the tachometer had failed due to a ground in its circuit. A Simpson voltmeter was installed on the panel board which afforded a rough indication of centrifuge speed. The H-2 anti-reversing device was inoperative with the ground in the tachometer circuit. It was planned to repair or replace the tachometer during a planned shutdown for rework of previously collected sump waste. However, the plow failure occurred two days prior to the specified date for the shutdown. A new centrifuge was installed and checked out by August 8, 1954.

b. E-12 Agitator - Redox

A new E-12 agitator was installed during the shutdown for the centrifuge change. The old agitator failed due to a broken shaft.

c. 1 AF Feed Pump - Redox

On August 22, 1954, the 1AF feed pump showed a marked drop in amperage demand and the flow dropped to a point too low for continued operation. The pump was replaced and operations resumed. The exact cause of the failure is unknown although the extra long pile graphite bearings used on this pump are suspected. The replacement pump contains standard boron carbide bearings.

d. D-8 Waste Neutralizer Agitator - Redox

The D-8 (waste neutralizer) agitator failed due to a broken shaft. A shutdown of thirty hours was necessitated to test, run-in, and remotely replace this agitator.

e. Canyon and Silo Crane - Redox

Two major failures of the 60 ton crane occurred during the month. Both failures were due to breakdown of festoon cables - in one case the right hand auxiliary cable, in the other, the main trolley cable. Complete replacement of the cable was necessary in each case.

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g. Furnace Retort, Task II, Metal Fabrication

The retort of furnace No. 1 in Task II failed at the weld between the retort and flange. An attempt to re-weld was unsuccessful due to erosion of the retort body and the retort was replaced with a new one from spare parts.

C. Improvement Experience

1. Process Tests and Revisions

a. Backcycle of 3DW to 2DF - Redox

The production test, involving the backcycling of third uranium cycle waste to the second cycle as a feed stream additive, was stopped during the month in an effort to arrive at the source of the poor Uranium decontamination. No additional tests are planned until in-specification Uranium is produced routinely with the new Phase II equipment. The major improvement effort next month will be directed toward maintaining a sustained, steady state operation which will provide the maximum decontamination and extraction efficiency without sacrificing production throughput.

b. UO₃ Reactivity Improvement with Sulfamic Acid Additive

Four carloads of UO₃ produced with the sulfamic acid additive were produced and shipped as requested by the off-site customer. Caking occurred during the production of this UO₃ with the additive. Since it appears that the caking problem when the additive is present is related to the calcination pot agitation, further tests at lower agitator speed, 25 rpm versus 30 rpm, will be made when installation of new agitator gears is completed.

2. Inventions or Discoveries

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

D. Events Influencing costs

Separations Section expenditures are expected to show an increase for August over July due to increased Redox production, shutdown for Phase II equipment changes having been completed late in July, and increased TBP and UO₃ production. This increase in cost is primarily due to added essential material requirements associated with the higher production.

Return to a "no-backcycle" flowsheet, as mentioned previously, has prevented the Redox plant from realizing a potential savings of \$225/ton of Uranium processed. It is hoped that backcycle can be adopted in the near future after present process difficulties are ironed out.

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

Purex design is essentially complete. Construction as of August 15th is 61.5 percent complete compared with 71.9 percent scheduled completion. The estimated "Ready for Operation" date, i.e., ready for "hot" runs, continues to be August 1, 1955.

The project proposal, CG-598, for the Purex Vacuum Acid Fractionator has been approved by the A.E.C. - Hanford and is now in A.E.C. - Washington for approval and allocation of funds.

The project representatives and Design Council approved the revision request for the installation of the Purex ammonia scrubbers as part of the initial project. A.E.C. was reviewing the request at month's end.

b. Project CG-496, Recuplex Installation

Installation of piping and valves for process vessels continues. Construction forecast indicates the "ready for use" date as January 1, 1955.

c. Project CG-551, 234-5 Expansion

Shop fabrication and assembly of equipment is proceeding favorably. Installation is scheduled for January and February, 1955. Construction of the Final Inspection Facilities is proceeding satisfactorily.

d. Project CG-535, Redox Expansion, Phase IIStage I:

Waste Concentrator System: Fabrication and mockup of the D-12 waste concentrator jumpers have been completed. Preparation for the shop boilup test are nearing completion.

Stage II:

1. 233-S Concentration Building: The ventilation unit and associated ductwork and the exhaust system have been installed. Interior walls are ready for painting and installation of process equipment is in progress. Expected completion date is January 1955.

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

2. UNH and ANN Storage: The two UNH storage tanks should be completed by September 3, 1954.

Construction of the ANN storage tank is still in progress with completion expected by November 1, 1954.

3. Silica Gel Treatment: Design of the silica gel facility is approximately 55% complete. Design and procurement progress appears to be slower than desired. It is doubtful that the ready-for-operation date of March 1, 1955 can be attained.

e. Project CG-587, TBP Waste Scavenging

Excavation for cribs for TBP waste scavenging began in East Area on August 16. Work has progressed satisfactorily and it is expected that the facilities will be ready for use by September 15, 1954.

f. 4X Program, B Plant Reactivation

Plans for reactivation of the 200 East Area Bismuth Phosphate Plant continued with funds being made available for design and procurement, with the issuance of purchase requisitions, and with building inspections and evaluation.

The letter project proposal, HW-32431, Hanford 4X Program, Request for Advance Authorization of Design and Critical procurement was approved. Of the total requested, \$500,000 was allotted for 200-300 Area work and designated as Project No. CG-597; \$300,000 was allotted for metal handling equipment (cask cars, buckets, casks, etc.) and assigned as Project CG-599.

Approval of the project proposal, CG-603, requesting funds and transfer of capital equipment for activation of a third extraction unit at T Plant was obtained during August. This essential item will be forwarded as rapidly as possible.

2. Manufacturing Engineeringa. Standards

A revised excavation policy and permit for the 200 Areas was issued to all Sub-Sections and groups outside the Section that direct excavation work within the 200 Areas.

A new variance report form listing standard quantities, actual consumption, variances and reasons for variances covering essential materials, labor, analytical service, and steam was developed and presented for approval. All of the steam standards

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a. Standards (Continued)

have been reviewed and those for 221 and 224-U are currently being revised. Complete re-engineering of all labor standards was initiated to make them as nearly comparable to other G.E. plant standards concerning special allowances as is practical for this type of operation. Firm measurements on all jobs exceeding \$500 annual labor expense will be obtained.

b. Work Simplification and Cost Reduction

Arrangements for three Round Table groups starting on September 14, 15 and 16, involving 29 exempt and non-exempt personnel from all Sub-Sections, were continued.

An effort was initiated to reduce Operations Accountability effort in Redox. Records maintained by Operations Accountability are duplicated in part by other Redox records and by the SF Accountability Section. The investigation will attempt to establish an exchange of information with the SF Accountability Section which will permit a reduction of record keeping and record duplication within the Redox Sub-Section.

A Work Simplification proposal to revise the method of poppy monitoring at the 200-W Laundry was issued, indicating a potential savings of \$17,000 annually.

c. Engineering Assistance

Bids for purchase of a closed circuit television system to be used in conjunction with Redox crane maintenance were received and are being reviewed.

Inspections were made by an Underwriter's representative on the following equipment; Boiler #3, 284-W; high pressure receiver (Inert gas), Redox; passenger and sample elevators, Redox; passenger elevator in the weather tower.

A study was initiated to determine whether time cycle limitations in the Bismuth Phosphate pre-reduction cycle would require equipment procurement or modifications to meet expected production throughput. Results of this study will contribute to the preparation of the project proposal for B Plant start-up.

d. Property Management

Property Disposal Requests have been submitted to the Property Management Group for all 200 Area guard towers except those in the 234-5 Building exclusion area. The Radiological Sciences

d. Property Management (Continued)

Department has suggested that the towers, exclusive of the search-lights, be burned or buried because of the radioactive contamination on or around them.

An extensive clean-up program was initiated during August to improve the housekeeping of the 200 Areas. Plans are to dispose of all unnecessary material such as scrap wood and metal, construction buildings and forms, and worn out or unneeded equipment. In addition, material in storage yards is being appraised for need, and rearranged to improve appearances. Fences and barricades are being repaired and painted to bring them up to standard. These sub-standard conditions were mainly brought about by problems associated with the 200 Area general contamination and the lack of manpower to perform the clean-up. Resolution of the former has expedited the work so that the major portion of the cleanup is scheduled for completion in September.

F. Significant Reports Issued1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>
HW-32947	Separations Section Redox Plant Sub-Section Monthly Report - August 1954	R.T. Jessen
HW-32922	Separations Section Metal Recovery Plant Sub-Section Monthly Report - August 1954	V.R. Chapman
HW-32980	Separations Section T Plant Sub-Section Monthly Report - August 1954	C.T. Groswith
HW-32977	Separations Section B Plant Sub-Section Monthly Report - August 1954	T. Prudich
HW-32948	Separations Section Z Plant Sub-Section Monthly Report - August 1954	W.N. Mobley
HW-32736	Separations Section Mint Plant Sub-Section Monthly Report - August 1954	S.G. Smolen
HW-32930	Separations Section Analytical Sub-Section Monthly Report - August 1954	L.M. Knights
HW-32916	Separations Section Radiation Monitoring Sub-Section Monthly Report - August 1954	A.R. Keene
Official Use Only	Separations Section Projects and Personnel Development Sub-Section Monthly Report - August 1954	O.V. Smiset
Official Use Only	Separations Section Power and Maintenance Sub-Section Monthly Report - August 1954	C.P. Cabell
HW-32929	Separations Section - Essential Materials	G.E. Cooper
HW-32612	Essential Material Consumption Report for the Redox Plant	G.E. Cooper
HW-32613	Essential Material Consumption Report for the TBP Plant	G.E. Cooper
HW-32614	Essential Material Area Report to Cost and Purchasing	G.E. Cooper

1. Routine (Continued)

<u>Number</u>	<u>Title</u>	<u>Author</u>
HW-32615	Essential Materials Inventory - August 1 Orders Placed with Purchasing	G.E. Cooper
HW-32715	Essential Material Consumption Report for the T Plant	G.E. Cooper
HW-32697	Separations Section Waste Status Summary	D.E. Peterso
HW-32894	Monthly Progress Report - Plant Expansion Engineering and Control Sub-Section Separations Section - August 1954	F.A. Hollenb

2. Non-Routine

None	Development of Enthalpy Values for Use in Calculating Steam Standards for Building Ventilation, M.E. Report No. 3	R.E. Sillett
None	Poppy Monitoring at the 200-W Laundry, Work Simplification Proposal No. 5	M. Pociluyko
HW-32728	Precision of Plutonium Nitrate Shipments	L.M. Knights
HW-32826	Minutes of Meeting on T Plant "F" Factor	By M.J. Rasmuss
HW-32493	Hand Exposures during Routine Operation of the RMA Line, 234-5 Building (Part I)	M.J. Rasmuss
HW-32494	Hand Exposures during Routine Operation of the RMA Line, 234-5 Building (Part II, Appendices)	G.L. Helgeso
HW-32758	Radiation Incident, Class I, No. 379	D.R. Koberg
HW-32840	Radiation Incident, Class II, No. 78	A.R. Keene
HW-32890	Radiation Incident, Class I, No. 380	D.R. Koberg
HW-32737	Summary of Processing Hanford DR-10 Program	S.G. Smolen
HW-32757	Revised Batch Limits 234-5	E.G. Pieric
HW-32635	Z Plant Production Pattern FY 1955	F.T. Keenan
HW-32752	Requirements for B Plant Reactivation - A Preliminary List, Project CG-597	T. Prudich
HW-32875	Essential Material Flow Sheet of Precipitation Separations Process	W.G. Browne By H.W. Murray

III PERSONNEL

A. Organization

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

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	2	2	0
Redox Plant Sub-Section	201	222	/21

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B. Force Summary (Continued)

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Metal Recovery Plant Sub-Section	278	301	/23
Z Plant Sub-Section	160	181	/21
T Plant Sub-Section	174	194	/20
B Plant Sub-Section	3	5	/2
Mint Plant Sub-Section	37	0	-37
Power & Maintenance Sub-Section	374	328	-46
Projects & Personnel Development	62	66	/4
Analytical Sub-Section	163	165	/2
Radiation Monitoring	<u>77</u>	<u>77</u>	<u>0</u>
Section Total	1531	1541	/10

C. Safety Experience

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

D. Radiation Experience

One Class II and two Class I radiation incidents occurred and involved: (1) a fully qualified Radiation Monitor-Journeyman who received exposure in excess of the permissible limit through failure to keep an accurate account of his exposure over a two-day period while working at the Redox Plant (Number 78, HW-32840); (2) a potential exposure which occurred to two Operations Unit employees who were water flushing the solvent feed tank on the 8th aqueous makeup level in the 202-S Building without SWP control in a poorly defined radiation zone (Number 379, HW-32758); and (3) a Plant Utilities supervisor and an Instrument technician who entered a radiation zone in the 276-S Building without required Radiation Monitoring coverage (Number 380, HW-32890). Although all three incidents involved solvent handling facilities in the Redox Plant, two were directly attributable to personnel failure.

Decontamination and release of the RM line in the 234-5 Building from assault maks status was accomplished three weeks after the fire of July 27, 1954.

Crane contamination in the Redox Plant remained at an undesirably high level, making the necessary maintenance work more difficult. There has been essentially no reduction in radiation levels on the crane since the Phase II shutdown despite the intermittent decontamination efforts. Iodine emission averaged about 1 curie per day with a maximum of about 20 curies emitted over a two-day period. Regeneration of all three reactors failed to bring the iodine emission under control, with daily emission of 4-6 curies being encountered at month's end. The cause of the continued iodine emission was not determined although the possibility of the inadvertent receipt and

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D. Radiation Experience (Continued)

processing of insufficiently decayed pile discharge metal is being investigated. Ruthenium emission averaged 0.3 curies per day and no additional evidence of particulate emission has been reported by Radiological Sciences since the Redox startup on July 18th.

E. Personnel Activities

1. G.E. Selection Program for Supervisors

Evaluation was completed for six Operations personnel during the month.

2. Operations - Process Training

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

3. Visitations

L. M. Knights attended a meeting at Los Alamos, with representatives from Rocky Flats, Oak Ridge, and Savannah River to arrange a plutonium test sample program and discuss related analytical procedures.

ENGINEERING DEPARTMENTAUGUST 1954TECHNICAL SECTION

Approximately 250 nickel plated, hot-pressed, solid fuel elements are scheduled for pile charging during the September 3, C Pile shutdown. Reactivity tests in the 305 Pile indicate that a pile loading with this type of fuel element will give a reactivity loss of 38 inhours. A similar group of slugs with a 250 mil end cap thickness instead of 350 mils gave a reactivity gain of 24 inhours.

Material realized from the June alpha phase extrusion at Adrian has been machined to eight-inch slugs. Preliminary tests show that the normal uranium has a generally uniform grain size of .062 - .094 mm. in the heat treated condition, somewhat smaller than heat treated alpha rolled uranium. Orientation studies on two samples of heat treated material showed that the orientation was similar to that noted in rolled and heat treated uranium. The as-extruded metal exhibits no cruciform pattern as does rolled uranium. Rod surfaces were generally good and machining was accomplished with no undue difficulties. Examination of the hollow rods showed that the holes were somewhat eccentric but relatively smooth and uniform in a given rod. Tool development studies for the fabrication of hollow uranium rods is now scheduled for August 31.

Uranium slugs from Ingot Quality Studies 7, 8, and 9A have been canned and are awaiting charging in the pile. Markedly lower slug reject rates of 1.5% and 17.7% have been observed for slugs from pickled than unpickled derby stock respectively in IQS 9A. The reactivity measurements for bare slugs in IQS 9A indicate a nine inhour improvement for 105 piles for pickled derby slugs.

Aluminum samples which had been placed in the autoclave with deionized water at 300 C for 14 hours corroded excessively. With the exception of two alloys, 54-S and XK-183, the samples had disintegrated. A marked rise in pH indicates that static testing of these alloys at high temperatures will be of little value. At 275 C in buffered systems the corrosion rates were still excessive.

Superior Tube Company has produced successfully one 50 foot process tube of H Pile design from zirconium which is enroute to HAPO and should be received by September 1. This tube is the first of a total of 30 to be made by this process and to be evaluated at Hanford. This evaluation will employ various annealing schedules and in-pile operating variables.

During the month, the piles were limited by an exit water temperature of 100 C at B Pile and 95 C at the remaining piles. The Manufacturing Department plans to increase to the 105 C process specification limit sometime within the near future.

There were only two normal uranium slug ruptures during the month. Both were eight-inch triple dip material.

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A program document for K Pile start-up has been prepared in cooperation with the Manufacturing Department. A separate document will be issued to cover the dry pile temperature coefficient test.

At month-end, efforts were made to test out the modifications to the H recirculation loop that will permit in-pile boiling. A zirconium tube has been received and will be installed prior to the next boiling experiment.

The Redox plant incurred four complete shutdowns during the month; two to replace failed equipment pieces and two to correct for undesirable process conditions. The uranium and plutonium losses were normal with the exception of conditions generated by equipment problems (rotameter float stuck resulting in low 2AX flow and high 2AW losses [2.6 percent]).

The Waste Metal Recovery Plant "B" line demonstrated a new maximum processing rate of 9.5 t/d of uranium. The feed during this period was primarily Redox out of specification product. Waste losses were less than 0.10 percent. Determination of the allowable maximum was restricted by flow control equipment. The first failure of a pulse generator since plant startup occurred on the "B" line unit. Cause appears to be seizure of the cross-slide bushing due to lubrication failure. The oil in the unit was highly carbonized.

Reactivity improvements via the addition of sulfur or sulfur compounds were obtained on four experimental carloads which resulted in an improvement of 19 to 26 percent. A productive capacity decrease of about 17 percent was incurred due to caking difficulties.

A comparative analysis of the circumferential stresses of solid, cored, and internally-externally cooled fuel elements indicates the stress relief in the latter case to be considerably less than anticipated. The respective stresses were 35,000, 28,000, and 25,000 psi. Conditions assumed were for all cases 230° C exit coolant temperature, 50 KW/ft power generation, and an outside diameter of 1.36". The I.D. of both the cored and internally-externally cooled slugs was 0.5".

The feasibility of achieving a major increase in HAPO separations capacity by conversion of the Purex plant to use of carbon tetrachloride diluent has been reviewed in the light of data developed at various sites since the original scoping of the Purex plant in 1952. A flowsheet providing an instantaneous capacity of 35 tons U/day has been prepared as a basis for a detailed study of engineering feasibility and estimation of installation time and costs.

Current practice is to store RCU solution 12 to 24 hours before steam stripping to remove entrained and dissolved tributyl phosphate. Analysis of plant samples and laboratory determination of hydrolysis rates indicate that during this storage period dibutyl phosphate can form in concentrations exceeding about 20 ppm, which is the threshold for pot foaming during subsequent calcination of UNE to UO₃. Steam stripping of RCU before storage is indicated as a means of reducing pot foaming difficulties.

Plutonium metal currently obtained from slugs irradiated to about 200 MWD/T yields higher neutron counts (Pu-240 content) than were found in metal of the same exposure history produced several years ago. An explanation of this effect appears to lie in an increase of about 150 C in the average graphite temperature of the piles over the last several years. Calculations of the accompanying increase in neutron energies coupled with variations in capture cross sections with neutron energy predict an increase in Pu-240 content approximately equal to that observed.

File temperature changes will also affect long term reactivity changes markedly. Calculations indicate (1) that the initial rate of increase of reactivity with exposure increases substantially with increase in temperature and (2) the graphite temperature coefficient of reactivity increases with the average exposure of the metal in a pile.

DESIGN SECTION

Distribution of Design Section effort for the month was as follows: 34% to Design Development; 18% to the Expansion Program; 19% to Reactor Plant Modification for Increased Production; 2% to the 4-X Program, and 27% to other projects and design orders. This represents a major reduction in Expansion Program activity and a corresponding increase in other projects and design orders.

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

- a. Detailed Design for 1706-KE Recirculation facilities was advanced 8% to 28% complete.
- b. Detailed Design for the ultrasonic bond test equipment for CA-514, 300 Area Expansion, is 15% complete.

Total Design for Project CG-558, Reactor Plant Modification for Increased Production advanced to 30.8%. Scope design is 83.7% complete and detail design was advanced 4.8% during the month to 24.8% complete. Studies were completed on the need for second or "back up" Panellit instrumentation system as presently included in the project scope. As a result of these studies a scope revision request is expected to be processed at an early date deleting the second pressure sensing line and for the present replacing only the existing Panellit gages with "K" type gages.

Reactor design development effort was concentrated on the preparation of prescope information of an intermediate power level reactor and supporting facility design for a closed recirculation system for pile cooling.

Separation design development included the evaluation of the Technical Section proposal for THX Plant from the standpoint of feasibility, cost estimates, and timing, including design and construction schedules. Work continued on the Redox Plant ventilation studies and separation plant capacity studies.

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Evaluation of the fuel element canning machine development program is being made to determine whether continued development effort is warranted. Factors being considered include the future of present canning process, expenditure necessary to complete the canning machine development and estimated completion date for a successful production machine.

PROJECT SECTION

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

<u>Project No.</u>	<u>Title</u>	<u>Completion</u>	
		<u>Scheduled</u>	<u>Actual</u>
CG-496	Recuplex	74%	66%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	98
	Reactor & Bldg.	100	98.4
	KE - Water Plant	99	88
	Reactor & Bldg.	86	81.4
	General Facilities	96	95
CA-513	Purex Facilities, Part "A"	75	63
	Part "D"	80	85
CA-514	300 Area Expansion	54	58
CG-535	Redox Capacity Increase, Phase II	74	73
CA-539	Redox 241-SX Tank Farm	99.9	99.9
CA-546	Fuel Element Pilot Plant	46	22

The 900 pipefitters who were discharged on July 29, 1954, for failure to perform assigned work returned to the Purex construction site on August 2. Work was delayed intermittently by walkouts or stoppages involving carpenters, laborers, ironworkers, boilermakers, and operating engineers. The longest strike was by carpenters who walked off the Purex site on August 13. This strike continued until August 26 when a picket line was established at the North Richland bus lot and resulted in the absence of 3700 workers. Pickets were withdrawn on August 27, and a normal work force returned on Monday, August 30, 1954.

Miscellaneous Stores for Minor Construction was taken over by them on August 16 in Warehouse #1, 2, and 5 at White Bluffs.

At the end of the month there were 1005 current orders for items which require inspection.

At 100-K Area, all river pumps at 181-KW are operable from the 165-KW Control Room. The #2 boiler at 165-KW was operated on automatic control, and switchgear has been given preliminary tests. The 151-KW Substation is on permanent power. One transformer is on the line, and the other is ready for energizing. The 190-KW Building was ready for the dynamic flow test, utilizing temporary bowls for secondary pumps. Preliminary tests of 183-KW Filter Plant have been conducted, including chemical and silicate systems. At 105-KW Reactor, acceptance testing was 18% complete. All horizontal control rods have been run under power, and

installation was being completed for vertical safety rods and Ball 3X assemblies. Connectors on the outlet face have been completed, and 2500 front face connectors have been installed. For 105-KE Reactor, installations include top skin, Ball 3X hoppers, vertical safety rods, and step plugs. Horizontal rods were about 65% complete. Five rows of pigtaills have been set to assist final alignment of crossheaders.

An order was placed for two color-TV sets for Purex Canyon. Construction of 202-A Building consisted of painting, installation of roofing, and piping. Flushing of lines in the Hot Pipe Trench was started August 23. Electrical tests are being conducted on elevators and the remote crane. The central control room graphic panels are all set, and fifty transmitter racks have been set in place. The first canyon vessel, Filter F-A1, was installed in the process cell on August 23. Fifteen other vessels were delivered to the building. All of the required six tanks for 203-A have been erected. At 211-A Chemical Tank Farm, Tanks 11, 12, 40 and 41 were completed except for plug valves; and Tanks 20 and 21 were essentially completed. The subcontract for the 2901 Export Water Line was completed August 25, 1954. At 284-E Power Plant Addition, the coal conveyor was essentially completed. Boilers are being dried out, and auxiliary equipment has been operated with light loads. At 241-A Tank Farm, placement of concrete for tank walls was completed, and forms for tank domes are being placed.

ADVANCE ENGINEERING SECTION

Study of the feasibility of automatic operation of Hanford processes is being started. Automation at Hanford may be unusually advantageous since provision of remote control mechanisms which is a major expense associated with automation of conventional plants, already exists for a large part of the plant.

ORGANIZATION & PERSONNEL

Total on Roll, August 1, 1954	1,500
Accessions	36
Separations	40
Total on Roll, August 31, 1954	1,496

Effective August 14, 1954, H. P. Shaw was appointed Manager of the Process Engineering in the Design Section vice V. D. Nixon who transferred to KAPL. H. H. Hubble replaces Mr. Shaw as Head of the 100-300 Area Project Engineering in the Project Section.

A. B. Greninger
A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SECTION

AUGUST 1954

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The first shipment of duplicate periodicals to the United States Book Exchange for exchange for other material was made this month from the Plant Library. This method of disposing of surplus library material purchased with Government funds has been approved by the General Services Administration and provides a procedure whereby some return can be secured for the material disposed of. Exchange is on an item for item basis with a small charge for bookkeeping. Unused credits can be accumulated and used as desired. Over 800 duplicate periodicals were shipped and 200 issues of needed items secured in return. Early copies of the Management Review, Personnel Journal, and Machinery (London) were among those received. These acquisitions represent considerable cash savings.

The new document reserve job was organized during the month. The file of pending document requests was reviewed, and notices were sent to all requesters (550) to review the need for documents previously requested. Out of a total of 5,858 pending requests, many of which had been in the file for months, approximately 50% were still required by the requesters. Steps are now being taken to fill these pending requests by (1) recalling copies from the present holders, (2) borrowing copies from the present holders for a short time in order to reproduce additional copies, (3) notifying the requester that someone in his immediate group already has a copy, (4) reproducing from the file copy and (5) ordering copies of the document from offsite.

During the month the following major contract activities were handled:

1. The close out and settlement of Special Agreements Nos. 5 and 12 between the General Electric Company and National Carbon Company is currently being handled by correspondence and discussion. General Electric Company, the Commission, and National Carbon Company are hopeful that a mutually satisfactory agreement and settlement can be reached in the near future.
2. Modification No. 1 to Special Agreement No. G-30 between General Electric and Charles Bruning Company, Inc., covering an extension of time of the contract was approved by Bruning August 2.
3. Modification No. 1 to Special Agreement No. G-31 between General Electric and Abadan-Spokane covering an extension of time and the revision of the contract price was sent to Abadan July 20. The reason for the unusual delay in executing of documents by the contractor in this case is being investigated.
4. Modification No. 3 to Special Agreement No. G-38 between Morgan Wheeler and Company and Hugh H. Russell covering an extension of time was executed by Wheeler and Russell August 6, 1954.

5. Special Agreement No. G-46 between General Electric and Precision Tube Co., Inc. covering the development and fabrication of an expanding spline was executed by the Contractor August 31.
6. Modification No. 1 to Special Agreement No. G-45 between General Electric and Travelers Indemnity Co. providing for an extension of time was executed by the contractor August 13.
7. Lease Agreement No. L-1 between General Electric and the Northwest Utilities Group covering rental of office space in the 703 Building was executed by the contractor August 23.
8. Lease Agreement No. L-2 between General Electric and the Richland Softball Association was submitted to the Commission for approval August 11.
9. Special Agreement No. G-48 between General Electric and the Future Farmers of America, Inc., providing for the exchange of certain sheep was sent to the Future Farmers for execution August 19.
10. Modification No. 1 to Consultant Agreement No. 116 between General Electric and George W. Watt providing for an extension of time of the agreement was executed by the consultant August 31. The agreement is being held by this office pending the resolution of the question of security measures taken by Dr. Watt for the protection of classified documents assigned to him.
11. Special Agreement No. G-49 between General Electric and the University of California at Los Angeles covering the use of University-owned seam welder was sent to the Commission for approval August 31.





R. J. SCHIER, MANAGER
ENGINEERING ADMINISTRATION SECTION

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PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

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VISITORS AND BUSINESS TRIPS

T. J. E. Glasson visited here August 2 and 3, and August 16 and 17, 1954, from Knolls Atomic Power Laboratory, Schenectady, New York, for discussions on KAPL-120 in-pile loop facilities.

C. E. Stevenson visited here August 16 through 20, 1954, from Phillips Petroleum Company, Idaho Falls, Idaho (Arco), to discuss processing programs.

S. W. Mrozowsky visited here August 5 through 15, 1954, from the University of Buffalo, Buffalo, New York, for discussions on graphite production and irradiation damage of graphite.

R. L. Dickeman attended a Physics Conference at Knolls Atomic Power Laboratory, Schenectady, New York, August 23 through 27, 1954.

M. V. Davis and L. W. Lang visited Carbide and Carbon Chemical Company - K-25 Plant, and Oak Ridge National Laboratory - X-10 Plant, at Oak Ridge, Tennessee, August 25 and 26, 1954, to inspect facilities and conduct technical consultations on process variables affecting nuclear performance of product.

N. O. Strand visited the Bingham Pump Company, Portland, Oregon, August 23, 1954, to observe dynamic test of a pump on order.

N. G. Wittenbrock visited Allis-Chalmers in West Allis, Wisconsin, August 9, 1954; Babcock and Wilcox in Alliance, Ohio, August 10 and 11, 1954; Combustion Engineering in New York, New York, August 12, 1954; Worthington in Harrison New Jersey, August 13, 1954; Ingersoll-Rand in New York, New York, August 15, 1954; DeLaval in Trenton, New Jersey, August 17, 1954; Westinghouse Atomic Power Division in Pittsburgh, Pennsylvania, August 18, 1954; and Oak Ridge National Laboratory at Oak Ridge, Tennessee, August 19, 1954, for technical consultations with manufacturers and users of high pressure, high temperature pumps.

J. C. Johannessen, G. E. Wade, and M. R. Wood visited Phillips Petroleum Company, Idaho Falls, Idaho (Arco), July 27 through August 2, 1954, for installation of GEE-4 experiment.

ORGANIZATION AND PERSONNEL

	<u>July</u>	<u>August</u>
Administrative	5	5
Pile Development	66	54
Pile Engineering	79	75
Special Irradiations	24	24
Technical Liaison	5	6
Total	179	174

Administrative: One Technical Graduate - Rotational was permanently assigned.

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File Technology Sub-Section

File Development: One Chemist I was hired in, one Engineering Assistant 19 was converted to Junior Engineer, one Engineering Assistant 15 transferred to Separations Technology Sub-Section, and one Physicist I and one Chemist I terminated.

File Engineering: One Stenographer was hired in, one Technical Graduate - Rotational transferred to Fuel Technology Sub-Section, one Technical Graduate - Rotational transferred to Design-Process Technology, one Engineering Assistant 12 and one Mechanical Engineer terminated, and one Secretary C went on Leave of Absence because of pregnancy.

Technical Liaison: One Technical Graduate - Rotational transferred in from Project-Minor Projects.

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Fb-3

PROCESS TECHNOLOGYPower Level Limits

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

Process Changes

Five revised Process Specifications - Reactor Process, were approved. Specification 44 now allows the installation of 63S aluminum thimbles. Specifications 24, 52, 54, and 59 were made applicable to the K Piles. The quantities of serviceable K Pile vertical rods were specified and the numbers of vertical rods and ball 3X units required at K during operation and shutdown were given.

Slug Rupture Experience in August

Uranium Failures - Two side failures of normal, eight-inch, triple-dip canned slugs occurred, one at B Pile and one at F Pile. The rupture at F Pile caused a process tube water leak of about 600 gallons.

Failures in Non-Uranium Loadings - Two "C" slugs in the C Pile ruptured. One rupture was of the cap failure type; the other has not been inspected.

Two ruptured "J" slugs were discharged from DR Pile. Both pieces were swollen and had split jackets.

Investigation of Rupture Mechanism

Thermal Cycling of Slugs - Production Test 105-556-A - The four enriched slugs being thermally cycled at H Pile by control rod movement were discharged on August 4, after they had reached an exposure comparable to that of the highest powered slug in a normal column having an exposure of about 350 MWD/T. They had been subjected to approximately 675 partial cycles of control rod movement and 38 full cycles by pile shutdowns without the occurrence of a slug failure. A third tube, which was used as a control and was not being cycled, remains in the pile. It is scheduled for discharge at normal goal exposure.

Irradiation of New Fuel Slugs

Cored Slugs - Production Test 105-570-A - This production test authorizes the irradiation to failure of two tubes of cored-uranium lead-dip slugs and two tubes of standard control slugs at both high and lower tube powers. The four tubes charged at C Pile have operated for one month without incident. Four tubes will be charged in F Pile in September.

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

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Powder Metallurgy Slugs - Production Test 105-576-A - This production test authorization for the exposure of one tube of slugs and a standard control tube to rupture at C Pile and of about a thousand slugs to normal exposure at F has been approved. Charging is tentatively scheduled for mid-September.

Unbonded Slugs - Production Test 105-578-A - The production test authorization for the irradiation to failure of "C"-Process-canned solid and cored uranium slugs, and of nickel plated "C"-Process-canned solid uranium slugs has been approved. A total of sixteen tubes will be charged, and six of these will be irradiated until a rupture occurs.

Hot-Press-Canned Slugs - Production Test 105-577-A - The production test authorization has been approved. Solid slugs with fusion and diffusion welds, cored slugs with fusion welds, and control slugs will be irradiated. Charging is planned for the next outage of the C Pile. Fifteen tubes will be charged, and four of these will be irradiated to rupture.

Unbonded Slugs - Point Pressure Closure - Production Test 105-580-A - A production test authorizing the irradiation of unbonded slugs with point pressure closure is circulating for approval. A total of eight four-inch pieces, spaced with normal slugs, are to be irradiated in three tubes to 200, 400 and 675 MWD/T for metallurgical examination. One tube containing 4 cored pieces and 4 solid pieces will be irradiated until a rupture occurs.

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

Unbonded and Mechanically Bonded Point-Closed Slugs - Production Test 105-584-A - A production test to authorize irradiation of unbonded and mechanically bonded point-closed slugs has been prepared in rough draft form. Lead-dip control slugs will also be irradiated for comparison. Three tubes of each of the three slug-types will be charged, and one of each will be irradiated to rupture.

Extruded Cored Slugs - A production test to authorize the irradiation to rupture of two tubes of extruded, cored, eight-inch slugs has been prepared in rough draft form.

Uranium-Silicon Alloy Slugs - The rough draft of a production test designed to determine the advisability of further testing of cored and solid, alpha-extruded, uranium-silicon alloy slugs has been prepared. One tube of each type will be irradiated until a rupture occurs.

Manufacture of Other Products

Preliminary Irradiation of J-Q Columns - Production Test 105-567-A - One column of the thirteen-tube block was discharged on 8-4-54 at a tube exposure of 40 MWD. The thorium (Q) pieces will be shipped to ORNL in early September for special separation and analysis of the uranium produced. A supplement to discharge eight of the remaining tubes early in November to meet the revised shipping schedule for irradiated thorium is circulating for approval.

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Quantity Irradiation of J-Q Columns - Production Test 105-579-A - Forty-one tubes have been charged in the H Pile and 120 tubes have been charged in the C Pile. A supplement to make the discharge schedule conform to the revised shipping schedule for irradiated thorium is circulating for approval.

High Exposure Thorium - Production Test 105-551-A - Tube 2180-D was discharged on 7-23-54 at an exposure of 2000 MWD/AT. The 25 pieces were examined and two were found with the end-caps bulged outward. The worst slug was photographed; it was not possible to establish a water-entry point. Several pits were visible in the can wall about 1/8" below the weld; one or more may have penetrated the can.

PILE PHYSICS

K Pile Startup Program Planning

The entire program for the KW Pile startup was carefully reviewed during the month, and a document describing the tests and procedures to be carried out was prepared in considerable detail in cooperation with Reactor Section. This document, HW-32869, to be issued shortly, will be signed by appropriate Reactor Section and Technical Section management to indicate approval.

Because of the unusual nature of the dry pile temperature coefficient test and the proximity of test conditions to known physical limits, a separate procedure document will be prepared to describe this test in detail.

Following completion of the above-mentioned document outlining the tests for management approval, work has been directed toward preparing a step-by-step operating guide. Reactor Section personnel have now been assigned to this work also, and it is expected that such a detailed guide will be largely completed during the next month. Early preparation of such detailed procedures serve to point out inconsistencies in intended procedures and to provide a firm basis for determining material, time, and manpower requirements in time to plan properly.

In order to insure an accurate comparison between dry and wet critical pile size determinations, helium will be used as the pile atmosphere during the dry critical loading rather than being admitted afterwards in a reactivity transient test as was planned previously. Vertical control effectiveness tests as a function of pile flattening have been deferred because of the cost otherwise involved in discharging uranium which had been activated during the dry temperature coefficient test. The wet pile temperature coefficient test using heat from the recirculation system will be carried out in the fully loaded pile rather than in the small wet pile as previously planned. Other tests not previously well defined have now been planned in sufficient detail to be included in the authorization document; these tests include lattice cell flux distribution tests for Applied Research and Special Requests, combined reactivity and flux distribution measurements to check the enriched column inter-action effect in a four-tube central block in the center of the fully loaded pile, and both wet and dry core ~~homogeneous~~ reactivity measurements.

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With 33 "C" columns loaded in the presently chosen KW enrichment pattern, sufficient reactivity is expected to permit a level of 1500 MW at the minimum reactivity condition and 2100 MW after long term gains due to production of high g/t plutonium has taken place. Some additional reactivity for going to higher levels may be obtained by loading more than 33 "C" columns in the enriched ring. The enrichment pattern, like the orifice pattern, is designed to provide 2400 effective tubes.

Equipment Design and Procurement for K Pile Startup

Considerable effort during the past month has been directed toward designing and ordering the special mechanical devices required to carry out the various K Pile startup tests with assistance from other groups, particularly the Mechanical Development Sub-Unit.

The Patco can ink used by Fuel Technology to mark process tubes appears to be satisfactory for marking the several tons of reject slugs to be required; a roller type painter has been fabricated to simplify and speed the marking process. Three thousand rubber discs have been ordered for pigtail blanking; the type of disc ordered requires the loosening of only one fitting and has been found to perform satisfactorily at pressures far in excess of startup requirements. Two partial-length test hole thimbles to contain ion chambers during startup tests are under fabrication. A BF_3 chamber insensitive enough to take flux traverses has been developed sufficiently by the Experimental Physics Sub-Unit to replace the gold foil traverse methods; the use of this method will save considerable preparation and post-irradiation counting work. Dial gages for mechanically monitoring the thermal expansion of selected process tubes during the dry temperature coefficient test are now on order. Instruments to check helium flow and composition of the gas in the process channels during the dry pile temperature coefficient test have been located; helium bottles are on hand for this purpose.

Other equipment requirements under active consideration are the fabrication of splines for removing front face shielding pieces following the dry temperature coefficient test, design of a gas lock for inserting and removing a foil-containing graphite bar at various times during the tests, devising means of cooling the HSR's and test facilities as necessary without the normal riser connections, supplying adequate shielding for test holes during the dry temperature coefficient test, and providing a method of drying tubes sufficiently for reactivity measurements without requiring that they be discharged and swabbed.

Product Yield and Quality Calculations

Information regarding the quality of low g/t plutonium reduced to shapes from the first 70 tons of uranium discharged at low exposures appears to agree with the basis used in setting present process specifications. The observed shape counting rates ranged from 19.2 to 20.0 n/g/s, with an average of the several shapes of 19.5. This material was all discharged prior to the time the discharge goal was lowered on the basis of early button counting rates. Efforts are continuing to correlate separations results with actual pile exposure; as indicated in last month's report, discrepancies in this regard are suspected in the case of early button counting rates which appeared unreasonably high.

Initial yield data from two dissolver solutions of 900 MWD/t material indicated product yields half-way between predictions based on parametric temperature curves

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(EW-31295) and those based on extrapolation of a curve fitted to chemical yield data at lower exposures (EW-31443). More separations data will be required before yield rates can be established to better resolution than the 2 1/2 per cent difference in predicted values at this exposure.

Methods given in EW-32753, "Production of Kr-85 in the Present Hanford Reactors," which was issued during the month have been found by the Statistics Unit to show accurately the Hanford plutonium output over the entire plant history. EW-32786, "Activity of Ru 103 and Ru 106 in Fission Products," was also issued during the month to aid in determining the age of ground contamination originating from the separations plant.

Shield Attenuation Studies

Because of the long period of continuous operation currently underway at the DR Pile, no new results from shielding experiments were obtained during the month. A study is underway to determine approximately the neutron energy spectrum in the shield from the relatively meager indications from cadmium ratios using gold foils and from $S^{32}(n,p)P^{32}$ activation data. Such a determination would be useful in interpreting flux readings in the simulated masonite burnout experiment in terms of biological effects.

The possibility of converting one of the DR Pile shielding test facilities to a water tank facility is being investigated. The main advantage of such a facility is that materials being tested may be changed during operation, and fluxes may be monitored directly instead of by use of foils, thereby speeding up data taking considerably. An inquiry has been received from KAPL shielding personnel regarding the possibility of measurements at Hanford in such a facility in support of the SAR program. The main problem involved is that of shielding gamma radiation without appreciably attenuating neutron intensity.

Slug Shipping Casks

Calculations based on N slug activity measurements taken a year ago were made to determine the amount of shielding necessary for shipment of large numbers of N slugs in a single cask. Because of the high energy gamma emitted by the relatively long half life isotope of antimony, a six-inch thick shield would be required.

Because of the beam observed around the lid in the present J slug shipping casks, a change was proposed in the new design. The suggested change to provide a step in the lid would require a heavier cask than is allowed in the new design. Based on experience of little or no observed activity through the cask walls, it appears that the top plug should be stepped at the expense of a slight reduction in cask wall thickness.

HEAT TRANSFER

Cooling-By-Boiling Experiments

Further boiling tests on the full scale mock-up have been run to determine limiting conditions for boiling in the H Loop. The most severe conditions of operation to date have been at a maximum specific power of 44 kw/ft, 250 F inlet water temperature, a flow of 6 gpm, 300 psig rear header pressure and an exit quality of

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Pile Technology Sub-Section

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33 per cent. A nickel heater tube was used in this test; it gave a uniform heat generation in the upstream half of the active zone and a cosine heat distribution in the downstream half. Total heat generation was divided almost equally between the uniform and cosine sections of the heater tube.

Tests were also performed using a 600 kw uniform, aluminum heater tube. For this case back pressures as high as 635 psig were used and it was found that burnout did not occur until the steam quality reached 41 per cent. This quality was twice that which would have been predicted based on extrapolation of data obtained at lower pressures. Tests of this type are being continued in an effort to obtain additional data at static pressures of 800 lbs.

Cooling-by-boiling data at high specific powers (up to 100 kw/ft) can not be obtained on the full scale mock-up. Since such data are necessary for a broader understanding of the problem, attempts are being made to perform high specific power tests on the short tube mock-up. This short tube mock-up is identical to the full scale mock-up except for the fact that the heater section is only 42" long. Exploratory tests have been completed utilizing a stainless steel tube, and additional tests are planned.

H Loop Boiling

The specifications for in-pile boiling at H were altered to permit a maximum exit steam quality of 20 per cent by weight. These operating conditions were discussed in "Modified Conditions for In-Pile Boiling at the H Pile," W.D. Gilbert, HW-32872, 8-26-54. A summary of the conditions are as follows: rear header pressure, 300 psig; minimum pump discharge pressure, 550 psig; maximum tube power, 365 kw; permissible exit steam quality, 20 per cent by weight; tube inlet water temperature, 260 F and minimum permissible tube flow rate, 7 gpm. The above conditions are based on experimental data obtained from the full scale mock-up.

A second document, "Safety Consideration of In-Pile Boiling at H Pile," K.G. Toyoda, HW-32692, 8-6-54 was also issued. This document discussed the safety aspects associated with in-pile boiling in the loop. During normal operation sufficiently high supply pressures must be provided to ensure stable, non-burnout boiling. The pressure conditions and instrumentation necessary to prevent damage in the event of abnormal flow conditions are enumerated. Finally, methods for passing from the non-boiling to the boiling region are discussed.

Equipment Procurement and Installation

The motor-generator set to be used for safety and other studies has arrived on the plant although some associated components are still missing. Procedures to install the equipment are being established and it is hoped that construction of the generator mount can be started within a week.

Hydraulics Laboratory Studies

Due to the facts that the rear pigtail nozzle connection is at the bottom of the K outlet nozzle and that the ends of an 8" perforated dummy are opposite this opening in a normal charge, a pressure loss of about 10 psi at 50 gpm results. A recommendation will be made that a spacer be provided at this location to prevent the 10 psi pressure loss.

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Slugs Temperature Calculations

An investigation of the formulas commonly used on the plant to calculate slug surface temperatures at high temperature and flow conditions was made. It was found that these formulas are adequate for conditions appreciably more severe than those existing at present. Details are contained in "Adequacy of the Formulas Used to Calculate Heat Transfer Coefficients Between Slug Surfaces and Coolant at High Reynolds Numbers and Temperatures," H.H. Greenfield, HW-32500, 7-30-54.

Calculations were made of the temperatures to be expected in the internally-externally cooled slugs to be charged into C Pile in the near future. The results indicated that the Δt across the annulus and hole would be within 2 - 3 C. These results were based on flow relationships determined analytically. They are presently being checked against experimental data.

Calculations were made to determine the temperature to be expected in a zirconium-jacketed, uranium-magnesium fuel element at the request of Applied Research Sub-Section personnel. The results are presented in "Calculated Temperatures in a Uranium-Magnesium Fuel Element," S.R. Fields, HW-32770, 8-17-54.

Slug Temperature Measurements

"Interim Report No. 1 - PT 105-552-A, Measurement of Slug Axial Temperatures," R.P. Schmitz, HW-32176, 6-21-54 was issued giving the results from the exposure of the Ike thermocouple slug in the C Pile. It was found that the thermal conductivity of the uranium apparently increased. This result was unexpected and no explanation is known. An attempt will be made this month to recover the thermocouples from the slug and recalibrate them.

"PT 105-545-A, Supplement A, Measurement of Slug Surface and End Cap Temperatures," R.P. Schmitz, HW-32677, 8-6-54 was issued. Its purpose is to authorize the installation of a slug having thermocouples mounted on the surface. The apparatus will, of course, be used to measure surface temperatures during in-pile exposures.

Pile Safety Studies

"Minimum Times for Water Removal from Process Tubes Following a Process Water Failure," W.F. Ekern, HW-32711, 8-10-54 was issued as part of a general study of pile safety. Presented in the report are estimates of the probable time required to lose the water from process tubes due to boiling following loss of header pressure or rupture of a pipe. These results will aid in defining reactivity excursions and thus heat generation rates in an assumed case of inlet riser failure.

EXPERIMENTAL PHYSICSSlug Rupture Detection

The bids received last month for the gamma spectrometer portion of the projects CG-578 and 579 to replace the beta slug rupture detectors at all operating piles have not yet been awarded. Bids have recently been received for the recorders and mechanical turret assemblies; thus far the bulk of the bids range well within the components costs estimated for the project.

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A formal report has been prepared discussing the development performance of the scintillation rear face survey meter to isolate the process tube containing a slug rupture with increased sensitivity. This report will be issued as HW-32761 "Portable Detector for Reactor Discharge Face Use in Isolating the Process Tube Containing a Ruptured Fuel Element," R.S. Paul and M.C. Greene. A formal report HW-32166, "Dual Channel Pulse Analyzer and Count Rate Meter for Gamma Spectrometer Monitor," R.S. Paul and M.R. Wood was also issued discussing the details of the electronic circuitry and its operation in the gamma spectrometer units.

The slug rupture detection system for the fuel element irradiation facility in the Materials Test Reactor operated during the month at Arco without incident. A discussion of the design and operation of this system is presented in HW-32232, "Hanford Fuel Element Testing Facility at the Materials Testing Reactor," G.E. Wade, R.S. Paul, and M.R. Wood.

Neutron Economy Studies

Measurements designed to assess more accurately the fraction of the fissions in U-235 which arise from epi-cadmium neutron capture are in progress. No firm result can yet be quoted for this fraction but corrections to earlier data are predominately in the direction of reducing the epi-cadmium fraction somewhat below the eight per cent figure tentatively advanced last month for "J" slugs.

Measurements of the resonance escape probability for thorium and thorium oxide relative to U-238 in the Hanford lattice via the danger coefficient technique are completed. The measurements were made by alternately shielding thorium, thorium oxide and depleted uranium slugs, all of equal dimension, in cadmium and determining the residual pile reactivity. This technique yields values of resonance escape probability (p) for thorium of 0.92 ± 0.02 and thorium oxide of 0.90 ± 0.04 . The calculated value of p for uranium entirely depleted in U-235 in the lattice is 0.874. An independent determination is progressing in which p for thorium will be derived from the measured distributions of U-233 formed in the slugs through neutron reactions at all energies as compared with those at thermal energy.

An informal report HW-32751, "Power Generation in Enriched Uranium Relative to Natural Uranium Fuel Elements," W.E. Niemuth, was issued. This work treated the case of "E" metal, i.e. uranium with 1.75 weight per cent U-235, and demonstrated that (1) theory is in fortuitous agreement with experiment in predicting the power generation of "E" metal to be 1.75 times that of natural uranium in the same unperturbed neutron flux, (2) an "E" metal loading does not "reflect" a power generation increase to the surrounding natural uranium columns of more than a few per cent, and (3) a substantial flux increase accompanies thick end caps which is reflected in increased power generation rates at the slug ends.

K File Startup Planning

The interpretation of reactivity measurements made in special pile loadings requires detailed neutron traverses so that leakage from the pile volume of interest can be detected and perhaps evaluated in some cases. Foil counting is prohibitive in time and manpower expended in the case of the extensive program planned to be conducted over a period of several days. Alternative techniques which have been developed include (1) boron trifluoride filled counters tailored to give the proper response under the conditions of measurement, (2) fission counters coupled

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with a specially designed circuit to degenerate cable capacitance, and (3) continuous copper wire. All three methods are applicable and will be employed in the various tests to the best advantage.

Numerous components are being fabricated in support of measurements of the neutron distributions and conversion ratio in lattices containing fuel and fuel-target slug assemblies which are or may be of potential interest to Hanford Production programs.

Instrument Development

The K Pile nuclear instrumentation fails to meet the Technical process specifications in that (1) activation of the safety circuit requires mechanical movements of the chart recorder pens and, as such, is too slow and potentially prone to mechanical failure, and (2) the requisite number of level trip systems are not available for the full specified range during start up. Recommendations for modification are discussed in HW-32837, "Project CA-512-R - Modifications to the Nuclear Safety Instrumentation," written by D.C. Pound.

The U-235 coated electrodes for the sub-critical neutron flux monitor have been received from Oak Ridge; all off-site purchases for this system are now on hand. The design of the test facility for DR Pile has proceeded jointly with Mechanical Development and is complete. It is expected that this system can be installed in DR Pile during the extended outage in October.

Outlet Water Temperature Recording Facilities

Detailed assistance was given the Design Section in an attempt to make the Flexowriter automatic outlet water temperature recording facilities at C Pile operative. Several modifications to circuitry and other components are required as is a replacement analog to digital converter.

The Flexowriter systems for the older areas which are being provided by a project are expected on-site before October 15.

Test Pile - Routine Tests

Regular metal testing proceeded routinely. Fourteen lots of Fernald billet eggs yielded EDS value ranging from 13 to 15.

Test Pile - Special Tests

Two lots of natural uranium slugs prepared by the powder metallurgy method were tested to determine the quality relative to natural uranium as regards pile reactivity. A 105 pile fully loaded with this material would lose about 60 in-hours; this result is consistent with previous work on powder metallurgy material.

Physical Constants Test Reactor

The bid for the building to house the Prototype Physical Constants Test Reactor and the Thermal Test Reactor was awarded and building construction begun. The bid was awarded on a lump sum contract with a 120 day completion requirement.

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HW-32889 JEL

The fabrication of components is proceeding. The mechanical portions of both the control and safety systems are now being fabricated. The preparatory work for the machining of the graphite in the 2101 Building facilities has been completed and graphite work begun.

The Reactor Hazards Report to the Advisory Committee on Reactor Safeguards has been completed in draft form. A total of 12.4 kilograms of U-235 has been formally allocated for use as fuel and control rod material for the reactor. Cost estimates for fuel fabrication are now being formally prepared by Oak Ridge personnel.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

In conjunction with the development of equipment to segmentally discharge process tubes several orders have been placed for different kinds of expanding splines. Tests were successfully performed on a mechanical holding slug to perform this same operation. Test work will continue.

The K Pile poison control facility flushing tests are now complete and a report is being prepared discussing the results. Satisfactory flushing was obtained for all materials but required the use of a special tip off.

The C Pile tip-off has been modified to provide a ruptured slug segmenting device. "Markal" paint sticks have been incorporated into the tip-off and mark the slugs as they are pushed out of the tube. The vendor has been contacted regarding the development of a paint stick incorporating a fluorescent type paint.

Horizontal Rod Studies

The new half rod was installed in the #8 rod opening at F Area early this month. No difficulty was encountered during the installation and indications are that the operation is satisfactory.

The thermocouple rod at H Area continues to operate satisfactorily. The maximum temperature reading has still not exceeded 95 C.

The motion pictures of the new horizontal rod installed at B Pile were returned during the month and viewed. The pictures indicate that the new tip is still in very good condition. No damage of any kind has been detected.

The ribbed sphincter seal installed on the A rod at C Pile on 6-14-54 continues to operate satisfactorily.

The design test for the K Pile horizontal control rod has been completed and the mock-up dismantled and stored. A rough draft of the test report is being circulated for comments.

Vertical Rod Studies

The design test of K Pile vertical safety rods being performed in the White Bluffs Test Tower continued during the month. Difficulties were encountered

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with the operation of the rod in that severe galling of the tube developed as a result of the piston rings being damaged by the 3X tie-in switch. Considerable delay has been encountered in obtaining a new cylinder tube from Construction to further evaluate this problem. As soon as the new tube is received additional life testing of the rod will be performed.

The washer seal installed on VSR 16-C continues to operate without leakage.

Supplemental Control

A re-assessment of disaster control systems containing certain new conclusions and recommendations was prepared in rough draft form during the month and is currently being reviewed by technical supervision.

The assembly of test equipment for experiments to confirm the cooling ability of a graphite wetting system proceeded during the month.

Design of the poison spline control system continued during the month. A very satisfactory method of fabricating the splines has been developed using boron powder compressed in a piece of thin walled aluminum tubing. Fabrication of several of the components required for this system continued during the month.

The majority of the equipment for the BF_3 supplementary control system has been installed in the laboratory. Contact is being made with other organizations for the determination of some of the metallurgical and chemical characteristics of BF_3 gas in contact with various containing materials.

Process Tube Assembly and Piping

The flexure testing of the replacement pigtails for 105-C has been completed and the aluminum connectors found to be satisfactory.

Drawings were completed on a new flexible connector testing facility and submitted to technical shops for estimate. An Appropriation Request will be processed in the near future to provide funds for construction of the facility.

A flexible teflon hose connector for C Pile outlet application was tested in the laboratory during the month. The connector has been found to be adequate insofar as flexing is concerned and a production test for on-pile testing is being prepared.

A design test was accepted for the fabrication and testing of a high pressure, high temperature loop to test various flange configurations and means of Van Stoning and sealing zirconium process tubes. The loop consists of a differential thermal column and will operate at 2000 psi at temperatures up to 600 F with quenching to 70 F within one minute.

Analysis of the data appropriate to the establishment of new allowable process tube pressures proceeded during the month.

Materials Testing Reactor Test Facility

The first A-piece was charged into the Material Testing Reactor Test Facility early this month. Testing has been satisfactory in every respect and the facility has been turned over to Applied Research Sub-Section for operation.

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Physical Constants Testing Reactor

Fabrication was started on eight horizontal control and safety rods and the four vertical discs for the Physical Constants Test Reactor. Construction of the 305-B Building was started on 8-25-54. The jigs and fixtures for the graphite fabrication are nearly complete and graphite machining has started. Purchase Requisitions for all major mechanical components have been issued.

Other Engineering Development Work

In conjunction with the application of television to rear face monitoring at B Pile, the possibility of utilizing a three dimensional system was considered and the decision made to defer its use at this time.

Assistance continued during the month on the development of equipment for irradiated process tube examination work. The design of a special saw to remove stuck slugs from sections of process tubes is almost complete.

Assistance was rendered the Experimental Physics Sub-Unit in the conversion of the 105-F quadrant monitor system to permit use in a water cooled tube.

An evaluation was made during the month on the application of ultrasonics to purging of pile process tubes. The use of ultrasonics for this work does not appear too feasible but several other applications are being considered such as decontamination and cleaning.

GRAPHITE STUDIESPT 105-536-E, Higher Temperature Burnout

The second birdcage charged into the central tube of the thirteen tube diamond array of JN loading at C Pile will be discharged on September 3, 1954. The initial birdcage was fabricated from zirconium wire while the second was of titanium. A supplement to the original production test has been written which authorizes the use of alsimag, graphite, and quartz as carrier material. Prior to issuance of this supplement, samples of alsimag and lavite were exposed in the E test hole facility at F Pile to determine radiation induced gamma activity. The data show for an exposure of two weeks to a neutron flux of 10^{13} that 1 gm samples of lavite and alsimag have a 28 mr/hr and 1.6 mr/hr activity respectively after a 30 hour decay period. Details of this exposure and subsequent calculations are summarized in document HW-32873, "Pile Induced Gamma Activity of Alsimag and Lavite." by D. B. Lovett.

Surface Area Measurements

The third and final set of plates in the #8 rod channel of F Pile were removed on August 2. A total of 81 plates were removed from this channel, the first set of 54 on March 2, and the second set of 25 on July 8. Selected samples were machined from the plates and measured for surface area which, in turn, can be correlated to total oxidation. The data indicate a maximum oxidation of approximately 0.1 per cent. Since the operation of the #8 rod over a period of years

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may have resulted in a distorted neutron flux and exposure temperature of these plates, some doubt exists as to whether such samples are representative of the graphite in the central filler layers. Examination of the plates removed on August 2 should clarify these data since the #8 rod has been inoperative since February.

The heat of absorption of nitrogen on the surface of virgin, irradiated and oxidized graphite samples has been initiated to explain the anomalous behavior associated with various rates of oxidation. Initial measurements on virgin graphite indicate heats of absorption of 2.3 to 1.7 kcal/mole for cases where the surface coverage was 79 to 100 per cent. These values compare favorably with previously published data.

PT 105-521-E, Full Sized Graphite Bars

Samples have been obtained from one of the five full sized bars removed from the G test hole of the C File. These samples, 3/4 inch in diameter, were cut from the bar exposed nearest the center line of the pile and have been measured for total surface area. These measurements indicate a maximum per cent oxidation for the corner samples of 0.2 per cent. The data also indicate a decided gradient of oxidation across the bar. While these measurements are preliminary, it would appear that the graphite stack at C File has not been oxidized to any appreciable extent. Measurements are now being made to further define the oxidation gradient within the bar. If the gradient proves to be exceedingly sharp, it can be concluded that oxidation is largely a geometric surface phenomena. Insofar as the structural strength characteristics of the graphite stack are concerned, such a conclusion is an extremely important one.

PT 105-532-E, File Oxidation Monitoring

Routine monitoring samples were removed from D File on August 18. Large size samples exposed in the center portion of the tube channel indicated a burnout rate of about 3%/1000 days for CSF graphite. This is approximately three times the rate which has been observed in the past. This may be explained by air leakage into the pile as a result of abnormal operation of the gas circulating system. Since the observance of the extremely high burnout rate at F File last month (48%/1000 days), steps have been taken by Operations Sub-Section to prevent such air leakage.

In addition to the CSF samples exposed at D File, some experimental graphite samples were included. Samples of a graphite fabricated at Battelle Memorial Institute which have shown excellent radiation damage stability indicated oxidation rates of 208%/1000 days. The material is characterized by a low density, 1.2 g/cc, a high degree of porosity, and a lack of what is commonly called "graphite structure." These characteristics undoubtedly have contributed to the extremely high oxidation rate.

File Core Sampling Device

The fabrication of the re-designed original core borer has been completed by the shops. Final laboratory evaluation is being made before pile sampling.

The new design adds operational sturdiness and safety. A method has also been found to allow about 1/8 inch addition saw travel. The additional saw travel will greatly increase the probability that complete penetration of the block can be made and cores removed from the stacking.

PT 105-535-E, Supplement A - Alternate Pile Atmospheres

The experimental facilities for an evaluation of nitrogen as a pile gas atmosphere were installed in the H Pile on 8-5-54. In this test, the possibility that corrosion may be associated with the use of N₂ will be evaluated. Three facilities were charged.

1. Annulus tube facility (0776-E). Water saturated nitrogen is passed over cold Al and mild steel foils in the presence of cold graphite.
2. Process tube facility (1982-E). Water saturated nitrogen is passed over cold Al and mild steel foils in the presence of hot graphite.
3. Process tube facility (4173-E). Water saturated mixture of 90 per cent N₂ - 10 per cent CO is passed over cold Al and mild steel foils in the presence of hot graphite.

All nitrogen for the first charge is of oil pumped quality. A quantitative measure of corrosion will be determined from weight changes of the foils.

Difficulties encountered necessitated the passage of helium through the facilities from 8-7-54 to 8-11-54 at which time the gases of interest replaced the helium. These gases are being passed through the facilities at about 4 cc/min. as measured at the front face. This corresponds to a linear flow rate of about three ft/hr which will allow an abundance of time for the activation and reaction of gaseous species with the Al foils if such reaction occurs. This flow rate is also in the range of that calculated in the annulus between graphite and the exterior of process tubes in the pile.

WATER PLANT DEVELOPMENT

Flow Laboratory

In-pile pilot tests of pH 7.3 water containing 2.0 ppm dichromate were completed. Flow laboratory work on this water quality, simulating the current low pH pile test at 100-F, is now completed. Past trends of a 50 per cent reduction in corrosion rates continued. Tests of unfiltered water at pH 7.5 with 5.0 ppm dichromate, show corrosion rates about the same as those observed in normal process water. In-pile tests continued of unfiltered water at pH 7.0 with 5.0 ppm dichromate, and process water at pH 7.3 and 7.0 with 0.2 ppm dichromate.

Preliminary tests were conducted to determine the corrosion effects of reduced process water pH on the steel effluent line. It was observed that, at 90 C, pH's above 6.2 do not result in excessive steel corrosion.

Construction of 1706-KE Semi-Works proceeded, with the installation of additional equipment and piping. Overall completion is estimated at 55 per cent.

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Plant Tests

Operation of one-half the F plant with process water at pH 7.3 continued. Examination of short-term slug corrosion data did not confirm previous indications of significant reduction in corrosion rates at lower pH. The test is continuing, and longer-term data will be obtained from other tubes having weighed charges. The reduced dichromate test at 100-D continued; one-half of the pile is supplied with process water containing 0.5 ppm dichromate, with the other side having normal 2.0 ppm dichromate water.

Tube corrosion data from the high chlorine test conducted at DR indicated high rates of 72-S removal in water high in chloride ion. The data are being further evaluated and checked, since all slug corrosion data obtained to date indicate little or no effect of chloride ion content.

An investigation is being made to determine the feasibility of conducting a full plant test using unfiltered water. The DR plant appears most suited to such a test; studies are being made of needed piping changes, standby water supply, adequacy of the dichromate feed system, and other requirements for supplying unfiltered water of proper quality to the pile.

Recirculation Studies

Modifications of the in-pile H-Loop equipment were completed early in the month; the system has operated satisfactorily since then with an outlet temperature of 155 C. Water quality is maintained over 1 megohm-cm. The isothermal loop (ELMO-2) is operating at 185 C; some difficulty is being experienced with the make-up injection pump. High temperature loop ELMO-4 operated at 230 C using aluminum slugs in a zirconium tube; no galvanic corrosion effects were observed with this combination after several short test runs.

A study was made, in cooperation with Design, of available pumps for the in-pile high pressure recirculation loops at 1706-KER. Under scoped conditions of 2100 psi and 300 C outlet temperature, it appears that canned rotor pumps are best suited for use in the KER loops.

Boiling Studies

Several hours prior to the scheduled H Pile shutdown, an in-pile boiling test was conducted in the recirculation facility. Incipient boiling was reached at 300 psi and 230 C tube outlet temperature. Because of inadequate pressure control, the greater pressure drop in the outlet fittings and piping caused a pile scram. Improvements in the instrument control system are being made to permit controlled boiling in the tube prior to the next scheduled H Pile outage. The mock-up recirculation boiling loop, ELMO-3, operated satisfactorily. Two tubes operated during the month using partially condensed steam to obtain corrosion data under simulated boiling conditions. Steam qualities ranging from 10 per cent to 100 per cent are under study.

PILE COOLANT STUDIESProduction Tests

The four tubes operating in C Pile under PT 105-519-E operated satisfactorily and without incident at outlet water temperatures between 105 and 110 C. The present charges are scheduled to be discharged during September. Data from this production test were used to set the basis for K Pile corrosion limits as reported in HW-32763.

D Pile operated throughout the month under PT 105-542-E with one-half the pile on 0.5 ppm dichromate.

Corrosion Monitoring

A total of seven pile process tubes was examined during the month with no new or unusual corrosion observed. Inspections of the 105-F west high tank and the 183-F east chemical addition line showed them to be in satisfactory operating condition. No serious pitting was observed.

A borescope was modified for use in Van Stone inspections. Correlation will be made of visual observations of Van Stone pitting through the borescope with pit depth measurements.

The Probolog was tested to determine its sensitivity to changes in the tube wall thickness. The observed sensitivity of 0.05 inch deflection per mil change in wall thickness is considered satisfactory for locating severely corroded tubes. The background is such that a 5 mil thickness change is the minimum that can be detected.

Laboratory Corrosion Studies

Preliminary data from several laboratory tests of pH 7.3 water have been collected on 2-S, 72-S, and 63-S aluminum alloys in the range 75 C to 120 C. The pronounced effect of dichromate previously observed at pH 7.6 in reducing front tube pitting is being confirmed in the 50 tube mock-up with pH 7.3 water.

The use of ion exchange resins in filter beds is being studied as a means of producing soft water. Zeo-Dur which could possibly replace the sand in a filter was found to have too low an exchange capacity. Duo-Lite C-10 which could be used in place of the antirafilt is now being tested. Control of the apparatus to determine the scale-forming properties of water with varying degrees of hardness was found to be too difficult. As a result the Minitube apparatus is being modified to obtain this information.

A final report on the study of graphite-aluminum galvanic couples has been prepared and will be published during September. The importance of eliminating pile water leaks before resuming operation is stressed in this document.

A brief investigation was made of the stress corrosion of 2-S aluminum slug jackets. The fact that 2-S aluminum does not suffer from stress corrosion over the range of stresses that exist in the slug jacket leads to the conclusion that no problem exists.

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Preliminary calculations have been made to obtain slug surface temperatures and bulk water temperatures for corrosion considerations on the proposed internally-externally cooled slugs to be tested in C Pile. The calculations show that the water stream in the annulus may be 10 to 20 C hotter at the end of the active charge than the water stream in the hole. Such a condition would be detrimental if tube corrosion were limiting.

TECHNICAL LIAISON

File Investment Studies

Detailed consideration has been given to the effect of certain construction or operating features of a dual purpose reactor on the plant capital investment and unit product costs. Features studied included power rating, method of cooling (single or two phase), lattice spacing, slug design (solid, cored, or internally-externally cooled), and mode of operation (single purpose or dual purpose). Wherever possible, cost bases were made consistent with current Design and Special Study efforts. The primary object of this work is to determine the conditions which would result in the minimum possible total capital investment while maintaining an acceptable unit product cost. No final conclusions have yet been drawn.

Also of interest in these studies is the degree of flexibility available in the various possible designs. This is considered from the point of view of alternate fuel and target materials, geometrics, etc. which might prove desirable for slug stability or for alternate products, and from the point of view of potential increases in power rating or other changes to decrease unit costs as the result of subsequent technological advances. Although some general trends can be determined, it has proved difficult to obtain a quantitative comparison of flexibility among any broad range of designs.

Power Recovery Studies

Results of work done on possible power recovery from the K Piles are being compiled in a form suitable for comparison with current reactor proposals in terms of capital investment, unit power costs, and long range potential.

SPECIAL IRRADIATIONS

The accumulated exposure for the energy release (Bluenose) in a single process channel (EOC-270) is now 250 MWD/T. Average tube power (tube OT77C) was approximately 700 KW for the month of August. Difficulty has been experienced with the typewriter components of the digital system.

The eighth in a series of creep studies (KAPL-105) containing nickel creep specimens was charged into F Pile August 2. The ninth experimental assembly of this series was charged into the mock-up for out-of-pile studies on August 11. The latter assembly contains samples of commercial copper of which the creep rate will be studied at 365 C.

The KAPL-120 loop operated at normal conditions during the month of August until the shutdown of H Pile on August 30. Test sections were removed from the loop on this date, and preparations are being made for the shipment of these to KAPL.

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Design specifications for the modified high pressure, high temperature recirculating irradiation facility for KAPL are nearing completion. It has been decided that this facility will consist essentially of two loops. One of these will be the primary loop for high temperature and high pressure operation, and the other a secondary loop which will provide stand-by operation and maintain purity of recirculating water at much reduced temperatures.

Preparations are complete for the irradiation of zirconium and zircalloy-2 and aluminum alloys (HAPO-105) in pile atmosphere at elevated temperatures. These samples will be charged into the K-hole of H Pile as soon as shutdown time is available to remove the thimble from that hole.

Plans for the irradiation of zirconium and zircalloy-2 process tubes (HAPO-110) continue to progress. Delay in the arrival of the process tubes continues to be the major cause in delay of this in-pile experiment.

Three tubes at H Pile were charged with experimental assembly (HAPO-140) to study the in-pile reaction of nitrogen with graphite ambient pile temperatures. After the charging of these tubes, numerous leaks in the case lines required that the experiment be operated with helium in place of nitrogen. There is no concern, however, that this will have any major effect on the results to be obtained. All difficulties have been removed and satisfactory operation with nitrogen is now proceeding.

Drawing and procedures for the facility (HAPO-128) for high temperature irradiation of graphite samples have been completed and approved by all units concerned. Plans for fabrication are now proceeding.

Three graphite samples for the determination of low exposure damage to graphite at low temperatures (HAPO-144) were irradiated for ten days in the Snout I facility at H Pile. Plans for additional irradiations for continued studies of this type are in progress.

Liaison in support of the irradiation facilities for the K Piles continues. At KW Pile, front to rear general purpose test facilities have been installed, and two snout facilities are being assembled on the X-2 level.

Acceptance tests for the pneumatic facility for KE Pile were observed at the vendor's plant. Results of these tests give considerable optimism as to the potential value of this facility. It has been agreed with Design that the facility will be mocked up at HAPO for additional tests prior to final installation in KE Pile.

The project to provide water for the test holes at C Pile is now estimated to be about 50 per cent construction complete. Progress toward completion is limited by the large amount of work on this project which can be done only during shutdown periods of the pile and estimated completion date is October 31. However, two months' extension is being requested to allow for unpredicted delays.

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

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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
File Technology Sub-Section

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RICHLAND, WASHINGTON HANFORD ATOMIC PRODUCTS OPERATION

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

AUGUST, 1954

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VISITORS AND TRIPS

W. L. Chase visited here from Phillips Petroleum Company, Idaho Falls, Idaho, August 2 and 3 for consultations on CFM Program.

C. E. Stevenson visited here from Phillips Petroleum Company, Idaho Falls, Idaho, August 17 to discuss process problems.

G. W. Watt visited here from the University of Texas August 16 through 20 for process consultations.

J. H. Morse visited here from duPont, Savannah River Plant, August 17 and 20 to discuss 234-5 process problems.

H. G. Frus and W. A. Conwell visited here from Duquesene Light Company, Pittsburgh, Pennsylvania, August 19 for a tour through Redox Plant.

C. S. King visited here from Blockson Chemical Company, Joliet, Illinois, August 26 for information on teflon bellows for use in pump in process.

V. R. Cooper attended the supervisors meeting at Association Island, New York August 2 through 5.

E. T. Merrill visited the AEC - Arco, Idaho Falls, Idaho, August 16 through 20 to discuss separations process technology problems common to Arco and HAPO.

L. C. Amos visited the Bird Machine Company, South Walpole, Massachusetts, August 30 and 31 to observe test of centrifuge being fabricated for HAPO.

J. Dunn visited the Puget Sound Naval Yard, August 31 to direct and inspect centerless grinding of a pump shaft.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	<u>July</u>	<u>August</u>
Administrative	2	2
Contact Start-Up Engineering	4	4
Development	74	83
Process	47	47
Analytical Laboratories	35	34
Total	164	170

Chemical Development: One Technical Graduate - Rotational was transferred in from Reactor. one Technical Graduate - Rotational was transferred in from Project, one Engineering Assistant was transferred in from Operations, one Engineering Assistant was transferred in from Pile Technology, one Engineering Assistant was transferred in from Manufacturing, one Junior Engineer was transferred from Analytical Laboratories, one Laboratory Assistant "B" was promoted to Laboratory Assistant "A", one Laboratory Assistant "A" was promoted to a Technologist "C".

Plant Processes: One Engineering Assistant was transferred in from Project.

Analytical Laboratories: One Technical Graduate - Rotational was transferred in from Applied Research, one Laboratory Assistant "A" was downgraded to a Laboratory Assistant "B", one Technical Graduate was promoted to a Junior Engineer, one Junior Engineer was terminated, one Junior Engineer was transferred to Chemical Development.

PUREX DEVELOPMENT

Chemical Engineering Development

Vapor Liquid De-Entrainment - The permissible entrainment in the overhead from the several uranium, plutonium, and waste concentrators of the projected Purex Plant is limited by various considerations, viz.: by the maximum permissible specific radioactivity of the condensates to permit disposal by cribbing; by the permissible specific radioactivity of recovered nitric acid; and by the economic desirability of maintaining uranium and plutonium losses to the distillates at a minimum. The effectiveness of the HCP Concentrator de-entrainment column, where the de-entrainment requirement is the most stringent, was tested by means of a scaled down model, with "gold" uranium. On the order of 10 pounds or less of liquid feed was entrained per 10^6 pounds of condensate from the 6 inch diameter pilot column at superficial rates corresponding to from 3 to 20 tons U/day based on the 9 foot diameter Purex Plant HCP Concentrator column. For comparison, the permissible entrainment from the HCP Concentrator, as limited by a 5 microgram/liter maximum permissible plutonium concentration for disposal of the condensate by cribbing, is 200 pounds of entrained feed per 10^6 pounds of condensate -- based on Purex Chemical Flowsheet HW #3 conditions and 600 MWD/T pile exposure. The entrainment increased sharply to approximately 10^4 fold with a superficial rate increase above the equivalent of 21 tons U/day with 1 de-entrainment plate, or above 22 tons U/day with 3 de-entrainment plates.

Technical Manual

On August 25 the preparation of the Purex Technical Manual was about 48 per cent complete.

Mechanical Development

Pump Development - A Johnson 6AC, five stage, deepwell turbine pump (Uranium Recovery Plant Pump P-19-7) had operated on life test for 5379 hours pumping 60 per cent nitric acid at a rate of 8 gal./min. against a 72 foot head. Final inspection after this period showed a maximum diametral wear of 1.3 mils on the journals and diametral wear on the CSGBF pile graphite bearings ranging from 5.8 mils on the bottom bearing to 0.6 mil on the top bearing. All the bearings appeared to be in good condition and free from scoring. The throttle bushings were excessively worn and had permitted nitric acid to leak through. The test is considered to have demonstrated the satisfactory service obtained from CSGBF pile graphite bearings in a deep well turbine pump pumping nitric acid at ambient temperature and Purex Plant conditions.

Bearing Development - Samples of CS-312, a graphite supplied by the National Carbon Co., were subjected to corrosion tests by the Corrosion and Welding Sub-Unit of the Applied Research Sub-Section. In a static immersion test in boiling 65 per cent nitric acid the material exhibited a weight loss of 9 per cent during a 504

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hour period. Inspection after the test showed that the samples had suffered very little, if any. In this respect the material appears superior to CSGBF pile graphite.

Bearing tests of CS-312 in a bearing test machine and in pumps are being started.

Materials Testing

Nitric Acid Fractionator Corrosion Studies - Semiworks scale nitric acid fractionator corrosion studies which have been underway since February 1954 are now substantially completed insofar as reboiler corrosion is concerned. Further tests will be made primarily to study the corrosion of bubble caps and vapor risers.

The following general conclusions can be drawn from studies to date:

1. The most satisfactory stainless steel for use in a nitric acid fractionator reboiler is Type 304L.
2. The reduction in boiling temperature from 240 F to 160 F and the corresponding reduction in steam temperature from 330 F to 240 F brought about by vacuum operation results in an approximately 10-fold reduction in the corrosion rate of stainless steel (from approximately 10 mils/mo. to 1.0 mil/mo.).
3. The corrosion rate of Type 347 stainless steel in boiling 30 per cent nitric acid is one-tenth as great as that in boiling 60 per cent acid at atmospheric pressure (1.5 vs. 15 mils/mo.).
4. Based on preliminary tests, the corrosion rate of stainless steel exposed to vapor moving at 40 ft./sec. is approximately 50 per cent greater than that in quiet vapor.

Irradiation of Kel-F - Ten sample coupons from Kel-F sieve plates irradiated in dissolver solution and by the F-Pile basin gamma source are being flexed in the flexural fatigue tester. As reported last month (HW-32663) various coupons were irradiated over a range from 2.6×10^5 to 2.6×10^7 rads. None of the coupons have broken as a result of flexing for 126×10^6 cycles, which is equivalent to 875 plant days, at a stress of 75 lb./sq.in. The stress is estimated to be approximately 2.5 times as high as will prevail in the Purex Plant columns. It has been previously estimated (HW-32339) that it will require about 20 years for the sieve plates in the Purex Plant EC Column to be subjected to 2.6×10^7 rads of radiation (beta plus gamma). It appears, therefore, that the Kel-F should have a satisfactory life expectancy in the Purex Plant pulse columns.

Resistance of Amercoat 74 to Nitric Acid Solutions - Tests of Amercoat 74 in nitric acid solution at room temperature are continuing. Preliminary indications show that:

1. With Amercoat 74, there is no difference between the black and white seal formulations as far as nitric acid resistance is concerned, contrasting with results reported in recent monthly reports which show that Amercoat 55 black seal formulation is more resistant than Amercoat 55 white seal.
2. Elevated curing temperature increases the nitric acid resistance.

3. The fact that the resistance of Amercoat 74 on concrete is greater than when it is applied to metal has been confirmed.
4. The 5-coat Amercoat 74 will protect concrete from 60 per cent nitric acid attack for 20 hours. This compares to less than 8 hours protection afforded by the 3-coat system under identical exposure conditions.

REDOX DEVELOPMENT

Process Studies

Ozone Tail End Treatment - Based upon recent Process Chemistry Laboratory and Hot Semiworks studies, a preliminary flowsheet has been prepared for the tail end treatment of 60 per cent UNH solution. Based on laboratory and pilot plant tests made to date the flowsheet is believed suitable for processing either Redox or TBP 60 per cent UNH solution. By operating at the conditions shown on the flowsheet, ruthenium concentrations in the 60 per cent UNH solution ranging from 200 to 800 per cent of aged natural uranium gamma activity may be reduced to 20 to 80 per cent of aged natural uranium gamma activity. (Reference: HW-32896, "Flowsheet for Removal of Ruthenium from 60 per cent UNH Solution by Ozone Sparging," R. E. Smith to W. M. Harty, August 31, 1954.)

Tail end ozone sparging studies on Redox concentrated 3EU were continued in the nominal 50 gallon scale equipment described in last month's report. A total of 13 runs were made at different operating conditions. Data from the studies indicate that for a given ozone concentration ruthenium removal is more rapid at elevated temperatures and at higher gas-to-liquid ratios. No induction period was experienced (confirmed by laboratory tests) in the ozone treatment of this 3EU, although the laboratory had previously observed one. The lack of this induction period is attributed to the aging (approximately 60 days) of the feed solution between the time of its processing in the Redox Plant and its use as feed for ozonolysis studies. Ozone proved to be reasonably stable under the test conditions, losses ranging in the order of 2 per cent during transmission through 130 feet of 2 inch stainless steel line, less than 20 per cent in passing through the UNH solution, and 30 per cent to 50 per cent in passing through the caustic scrubber. Using air containing 1 per cent ozone for sparging, a ruthenium decontamination factor of 6 was obtained within 2 to 4 hours with a sparge ratio of 1:1 (one volume of ozone enriched air per minute per volume of liquid in the tank). When the ratio was changed to 1:4, the time was increased to 4 to 6 hours.

Process Chemistry

Hydrogen Evolution from Mercury Catalyzed Dissolvings - Seven additional laboratory runs were made using non-irradiated Hanford 4 inch jacketed slugs in a continuation of the study of hydrogen evolution during mercury catalyzed aluminum jacket dissolving with nitric acid. The laboratory data show that satisfactory aluminum dissolution rates may be obtained without excessive hydrogen evolution (less than 0.7 per cent by volume*) by dissolving in aluminum nitrate solution, or by dissolving in an initially acid free aqueous medium (water, sodium nitrate, UNH, ANN) with nitric acid added slowly. Two alternative dissolver flowsheets based on these findings have been proposed and the coating removal step has been

* For comparison, the lower explosive limit of hydrogen in air is 4.1 per cent by volume.

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demonstrated on a laboratory scale. One flowsheet involves dissolving the jackets in mercuric nitrate-aluminum nitrate solution to form basic aluminum nitrate, part of which is acidified to provide ANN for recycle as coating removal solution and the remainder of which is used to dilute and neutralize the uranium cuts, thus achieving a reduced uranium dissolving time cycle, by permitting higher acid concentrations in the uranium cuts. The other flowsheet involves dissolving the jackets in water (containing Hg as catalyst) to which nitric acid is slowly added, forming a basic aluminum nitrate solution which is used for dilution and neutralization during the uranium dissolution. Although the two flowsheets differ in equipment and routing changes required in the plant, they both offer a solution to the ammonia evolution problem, create no serious hydrogen evolution problems, and reduce the dissolver time cycles by as much as 7 hours (20 to 25 per cent). Runs are currently being made in a pilot plant dissolver in 321 Building to demonstrate the ANN flowsheet on a semiworks scale.

Continuous Calcination

Test runs were made during the month employing a 4 inch diameter continuous screw calciner to evaluate methods of operation leading to increased reactivity of the product. A run of 14 hours duration, at a production rate of 15.5 pounds of UO_3 per hour (217 pounds total) with 800 parts of sulfate ion per million parts of

The TBX facilities should prove capable of processing uranium at a 400 ton/month rate, except for the T Plant dissolution facilities which would be limited to about 150 to 200 tons of uranium/month. In HW-32691 several methods for attaining additional dissolution capacity are discussed briefly. The scheme presently being evaluated by the Design Section is one involving the construction of a new dissolver house at either the Redox or the TBX Plant. This new facility would be capable of providing the entire dissolution requirements of the TBX Plant and the Redox Plant, and would permit the shutdown of T Plant.

Economic data presented in HW-32691 predict a savings in operating costs of approximately \$11,000,000 per year by processing 3600 tons of uranium/year through the TBX Plant instead of through the T and B BiPO₄ Plants and the TBP Plant. Studies are currently being made by the Design Section which will determine the capital investment and time required to provide the TBX Plant and the new dissolver facilities.

Process Chemistry

Thorex Equilibrium Data - Laboratory batch contacts have been made to determine distribution data for thorium, uranium, and nitric acid, under the conditions of Thorex Process Study Flowsheet No. 7. Three-phase systems were encountered following certain of the contacts at high Th-TBP ratios.

Chemical Engineering Development

Cavitation in a Pulse Column - The nature and conditions of occurrence of cavitation in a pulsed sieve plate column due to excessive pressure drop through the sieve plates were investigated by means of a 3 inch diameter glass column. In most of the tests the liquid pulsed was water. With this medium the pulse amplitude frequency product at the cavitation threshold, as calculated by means of the orifice equation (Perry, "Chemical Engineers' Handbook, 3rd edition, page 403, Eq. 15(a)), and as confirmed experimentally, was approximately 70 in./min. The highlights of the findings are as follows:

1. No violent collapse of cavitation bubbles was observed and no cavitation "knock" was heard at any of the pulsing conditions tried. The frequencies tried ranged up to twice the cavitation threshold.
2. The cavitation threshold amplitude frequency products, measured at 1/2 inch and 1 inch amplitude, were in good agreement with orifice equation predictions.

HOT SEMIWORKS

Conversion to Purex

The conversion of Hot Semiworks facilities to the Purex process as of August 25 was 90 per cent complete. Installation of the stainless steel waste line to 241-C Tank Farm and construction of the waste self-concentrator is estimated to be 22 per cent complete.

REDOX PROCESS TECHNOLOGY

Summary

Operation was intermittent and off-standard during the month. Four complete shutdowns were required in order to accomplish the following items: (1) segregation of

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waste for recovery of plutonium from 2AW and 3AW losses; (2) replacement of H-2 Centrifuge No. 4 which had a jammed plow; (3) chemical flush of the extraction columns and canyon vessels to remove emulsifiers which entered the process equipment as a result of rework of sump material containing high plutonium and uranium concentrations; and (4) replacement of F-7 (IAF) pump. In addition to these operational difficulties, continued poor decontamination of uranium was experienced as a result of entrainment of small volumes of aqueous phase from the decontamination columns to the stripping columns. Several flowsheet changes were made in an effort to improve uranium decontamination, but none seemed to be of appreciable benefit. However, following the chemical flush of the equipment and replacement of the IAF pump, uranium decontamination was improved at month end. Plutonium decontamination was normal except for the period during which sump material was being processed. Uranium and plutonium recovery were normal except for losses incurred as a result of operational upsets, and most of these losses were recovered by waste rework.

Process Performance

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

	<u>Gamma Decontamination Factors (dF)</u>	
	<u>U</u>	<u>Pu</u>
Head-End	0.4	0.4
First Cycle	3.8	3.9
Second Cycle	1.3	2.0
Third Cycle	0.5	1.3
Overall	6.0	7.6

The uranium decontamination, particularly in the Second and Third Uranium Cycles, continued to suffer as a result of entrainment of aqueous phase from the decontamination to the stripping columns in spite of several flowsheet modifications made in an effort to improve decontamination. Flowsheet changes for which no effect was noted included (1) deletion of the caustic butt to the F-2 ICU Concentrator (with 3DW backcycle) in an attempt to eliminate solids, (2) a change in the composition of 2DA from 0.04 M HNO_3 to 0.5 M $Al(NO_3)_3$, 0.06 M HNO_3 deficient to reduce the specific gravity of the 2D Column scrub section and (3) an increase in the IBX acidity from 0.1 M to 0.5 M HNO_3 . Other changes which were attempted and for which no conclusions have been drawn on their effect include (1) an increase in the IAF temperature from 50 to 70 C to reduce viscosities and to decrease disengagement times in the IA Column, (2) discontinuance of the one-stage backcycle of aluminum nitrate from the 3D Column to the 2D Column and (3) return to a single scrub (vice dual scrub) 2D Column flowsheet. Backcycle and the dual scrub 2D Column flowsheet will be tried again when the process performance has become stabilized.

Plutonium decontamination was generally normal with the exception of the processing of IAF Batch HE-10 which contained recovered sump material (from IAF jumper leak during July, B-2 dissolver overflow, and F-1 (2DF) Tank overflow).

Both uranium and plutonium recovery were adequate. Nevertheless, considerable rework was required, including (1) recovery of sump materials (as noted above),

(2) recovery of plutonium from waste batches occurring as a result of (a) excessive water present in the hexone and (b) a low 2AX rate caused by a stuck 2AX rotameter bob and (3) recovery of flush solutions.

The emulsification problem which has been plaguing the uranium cycles since start-up with the Phase II equipment was particularly severe during the processing of HE-10, containing the recovered sump material. Following processing of six additional IAF batches without adequate purging of the emulsifier (presumable oil from the silo sump), the plant was completely shutdown from August 16 to 20 for a thorough chemical flush of the columns and tanks. On August 22, before the plant was yet stabilized on stream, another shutdown was required in order to replace the recently installed F-7 (IAF) pump. Following start-up on August 23 after the replacement of this pump, a definite improvement in Uranium Cycle decontamination performance and decrease in entrainment resulted. At month end the cause for the reduction in entrainment is not definitely known; however, the product quality appears to be restoring itself.

Equipment replacements were required during the month because of (1) failure of the H-2 Centrifuge No. 4 and (2) failure of the F-7 (IAF) pump. The centrifuge had a jammed plow. The pump rapidly lost capacity, apparently because of excessive wear of the process lubricated bearings. This pump, installed on June 2, 1954, was the modified P-103 Caustic Scrubber pump having seven pile graphite bearings.

Continued use of the temporary silica gel tail-end facility was required to decontaminate the uranium product which was out of specifications for fission product gamma activity because of entrainment in the Uranium Cycles.

Approximately 56.6 tons of uranium, excessively high in activity as a result of the processing of IAF batch HE-10, were shipped to the 221-U Building (Metal Recovery Plant) for further decontamination. No shipments were made directly to 224-U Building (Calcination Plant) during August.

Feed Preparation

The dissolvers were charged with uranium having an average pile exposure of 599 to 689 MWD/T and "cooled" 96 to 143 days since pile discharge. The semi-continuous acid addition technique for dissolving remained essentially unchanged. The scheduling of coating removal and dissolving to minimize the emission of ammonium nitrate from the stack has been continued.

All IAF batches were oxidized with the permanganate Head-End treatment procedure using chromic nitrate as the reductant. The catalytic kill technique was used to reduce the residual permanganate following oxidation, and partial scavenging with approximately 0.008 M MnO_2 was employed. Variations in the amounts of potassium permanganate and chromic nitrate added to different IAF batches were required because of the changing concentrations of reducing agents present as a result of waste rework and 231 and 234-5 Building recycle.

Process Chemistry

Entrainment in U cycle organic streams - The study of the entrainment of aqueous phase and solids in the Redox uranium cycle organic streams has been renewed, due to recent difficulties in the plant. The plant has experienced poor uranium

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decontamination, traceable to entrainment, since starting operations after the installation of Phase II equipment pieces. Recent laboratory findings have established the following points:

1. The entrainment problem is similar to that which arose during the last quarter of 1953. The nature of the problem and the findings reported at that time (HW-30108 and HW-30153) appear to be valid for the current entrainment problem.
2. Solids found in IAP, 2DF, 2DU, and 3DW were similar to each other in composition as shown by spectrochemical analysis, and contained iron as the chief metallic component with very little Mn and Al present. This suggests that the solids may have been largely contributed by the new equipment rather than by the head-end treatment. The solid found in IBU was quite different and contained Cr as a major component, with Ba and K as the chief minor metallic components. This suggests the possibility of metal organic materials such as soaps. The silica content of the solids ranged from 6 to 10 per cent of the total and thus may have been the most important contribution of these solids to the formation of aqueous-in-organic emulsions.

Underground Storage

The temperature profile in the three foot diameter test tank in 101-SX Waste Storage Tank changed only slightly during the month. The temperature on the bottom of the tank increased from 223 to 255 F; the temperature maximum at the four foot level remained essentially constant at 260 F; and the supernate temperature increased from 158 to 180 F. No evidence of bumping in the tank has been seen.

The temperature traverse of the 101-SX tank bottom indicates an average temperature of 266 F (approximately the waste solution boiling point under the hydrostatic head) and a range from 236 to 278 F without any specific pattern of distribution. The supernate in 101-SX tank had a temperature of 169 F and a liquid level of almost 23 feet on August 25.

Pressure surges in 101-S tank continued to occur with a frequency of about one per day and a magnitude and characteristic similar to those reported last month. There have been several instances when the bumping started immediately after transfer of coating waste solution into the tank.

Stack Activities

All three Silver Reactors were regenerated on August 25 and 26 subsequent to an unexplained high ($>13 \times 10^4$ curies/day) emissions of radio-iodine. Later information suggests that an unknown amount of "green" metal (i.e., short cooling period) may have been processed, resulting in unusual amounts of radio-iodine. U^{237} content of the decontaminated product uranium stream was indicative of an average "age" since pile discharge of 52 days. Air samples taken to evaluate the efficiencies of the J-3 (Ruthenium Oxidizer Off-gas Vent), J-5 (Vessel Vent) and J-6 (Condenser Vent) Filters indicate that they were in good condition with decontamination factors (for removal of particulate matter in the vent gases) greater than 1×10^3 .

URANIUM RECOVERY PROCESS TECHNOLOGYTank Farm Activities

Approximately 3890 net gallons of stored waste were removed by water sluicing and direct transfer of supernatant for each ton of uranium processed at the tank farms. Water sluicing increased the volume by about 5100 gallons per ton of uranium processed. Seventy-eight per cent of the uranium removed was aged a minimum of three years since pile discharge, after irradiation to an average 371 MWD/T, fifteen per cent was aged a minimum of 3.6 years after irradiation to 375 MWD/T, six per cent was aged a minimum of 2.9 years after irradiation to 487 MWD/T, and the balance was aged about seven years after 200 MWD/T irradiation. An on-stream time efficiency of over 96 per cent was realized at the three operating facilities (U Farm has been depleted of uranium aged over three years) with the minor curtailment due to two electrical failures of 104-BX Nagle pumps. Low removal rates were experienced at 101-TX, during final cleanout operations, but the continuous sluicing-blending operation at 104-BX gave consistently high removal rates. The CR facility processed BX supernatant. Tank 103-TX was cleaned out and released for alternate storage service.

Feed Preparation

Routine acidification of the above feeds utilized about 12,060 pounds of 100 per cent nitric acid per ton of uranium in blending operations at the tank farms and in butts made at 241-WR and 221-U to give an average 3.13 M titratable nitric acid concentration after about 68 volume per cent boiloff. Non-routine feed handling included the processing of 60 per cent UNH solutions from the Redox Plant and from 224-U comprising 5.0 and 2.8 per cent, respectively, of the total feed uranium processed. A small amount, about 0.1 per cent of the total feed uranium, of sump materials from 221-U was processed in addition.

Waste Handling

About 3870 gallons of concentrated, neutralized salt waste, containing an average 0.94 per cent of new feed uranium, at an average pH of 8.3, were returned to storage for each ton of uranium processed. An additional 0.04 per cent of the new feed uranium was lost in low activity wastes routinely cribbed at a rate of about 21,250 gallons per ton. The start of construction of cribs, for disposal of scavenged waste, occurred on August 23, 1954.

Solvent ExtractionOperating Conditions

The solvent extraction batteries operated at about 93 and 90 per cent on-stream time efficiency for "A" and "B" Lines, respectively, under essentially TBP HW #4 Flowsheet conditions modified to the use of dual-scrub RA Columns, 20 volume per cent TBP in hydrocarbon diluent as organic phase, RCX at 55 ± 5 C, RAIS at 5 M nitric acid until August 6, 1954, and the use of three weight per cent sodium carbonate as solvent wash as described, below, under "Solvent Treatment." Nominal instantaneous single line operating rates ranged from 100 to 175 per cent of nominal

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design input rate to give an overall plant processing rate of 113 per cent of design. The total uranium processed included 92.1 per cent tank farm feed, 5.0 per cent Redox Plant rework, 2.8 per cent 224-U, Conversion Plant, rework and about 0.1 per cent of 221-U, TBP Plant, sump material. The feed gamma activity averaged about 0.26 curies per gallon, equivalent to 3.4×10^6 per cent of aged natural uranium gamma.

Process Performance

RAW losses were 0.5 and 0.1 per cent of the feed uranium in "A" and "B" Lines, respectively, and were consistent with operating variables. No extreme deviations (e.g. over ten-fold above average) were experienced using either 125 per cent of flowsheet RAX flow with $K^{1/2}NO_3^-$ values ranging from 4.0 to 6.8 or, 115 per cent of flowsheet RAX flow with $K^{1/2}NO_3^-$ values ranging from 5.5 to 6.9.

RCW losses were 0.2 and 0.06 per cent of the feed uranium in "A" and "B" Lines, respectively. Erratic losses ranging from less than 0.01 to 2.2 per cent were experienced in "A" Line early in the report period under unstable conditions, of about 65 hours duration, requiring pulse frequency reduction to as low as 65 cycles per minute. Gradual improvement was noted during the period but a higher L/V, using 70 per cent of flowsheet RCX flow, has been generally required in "A" Line while "B" Line has performed well at only 60 per cent of flowsheet RCX flow. No instability was noted in "B" Line with peak losses of about 0.2 per cent of feed uranium occurring at the time of start-up or during rate changes.

Gross gamma decontamination factors from 4.0 to 4.5 gave product RCU at an average 175 per cent of aged natural uranium gamma when processing tank farm feeds and comparable dF's of about 3.3 gave RCU product at an average of ca. 130 per cent of aged natural uranium gamma when processing about 90 per cent rework (Redox) UNH-10 per cent tank farm feed through "B" Line.

Plutonium, nitric acid, and total metallic impurities in RCU product averaged 5.8 parts per billion parts of uranium, 0.076 pounds per pound of uranium, and 114 parts per million parts of uranium.

Solvent Treatment

A major departure in solvent washing procedure, from the use of RO Columns at L/V ca. 0.1 and ROO Receivers at L/V ca. 0.15 with three weight per cent sodium carbonate as ROS, to the discontinuance of the use of the RO Columns as contactors occurred on July 30, 1954. In addition an RCW Receiver Tank contact at L/V ca. 0.1 was initiated, using three weight per cent sodium carbonate as ROS, on "A" Line only. No significant change in solvent cleanup, or quality as expressed by dilute uranium RC E°/a values, has occurred in either "A" or "B" Line as a direct result of the changes in solvent washing techniques but long-term trends will be followed. Overall solvent consumption amounted to six gallons of TBP and 19 gallons of diluent per ton of uranium processed.

Capacity Testing

Using 60 per cent UNH, to provide a high feed uranium concentration in RAF, the "B" Line battery was operated at rates up to 9.5 tons of uranium per day without RC Column instability or increased losses (< 0.10 per cent). The organic transfer rate, RCW to RO Column, became limiting at this value.

Equipment

The 17-8 ("B" Line RA Column) pulse generator, which failed late in July, 1954, through seizure of moving parts, has been disassembled and inspected. The major problem appears to be seizure of the cross-slide bushing to the eccentric shaft, probably induced by inadequate lubrication. The lubricating oil, in the generator, appeared to be badly carbonized.

Process Chemistry

Uranium Recovery Plant Process Performance - Intermittent foaming occurring in the 224-U Building calcination pots has prompted further investigation of this phenomenon. The foaming characteristics of Uranium Recovery Plant C-1 solution (60 per cent UNH) and synthetic C-1 solution (prepared from Redox produced uranium spiked with DBP) have been determined as a function of storage time at 25 C. The data show a somewhat more rapid decrease in foaming of the plant C-1 solution, which may indicate the presence of another foaming agent in addition to DBP. The DBP analyses are not sufficiently accurate to permit calculation of DBP decomposition rate constants, but a rough estimate of 0.046 (hr.)^{-1} , corresponding to a DBP half life of 14 hours, may be made assuming a first order reaction.

URANIUM CONVERSION PROCESS TECHNOLOGY

Process Performance

An average production rate of 72 per cent of the nominal design capacity, for electric pots only, was sustained during the report period. No calcinations were planned for the gas fired pots pending repair of Pot No. 19 which failed through stress induced cracking. Major production curtailments were due to lack of feed from the extraction plants. Of the uranium calcined 88 per cent was from TBP processing and 12 per cent from Redox processing. Total metallic impurities, fission product gamma activity, and plutonium in product UO_3 were 131 parts per million parts of uranium, 66 per cent of aged natural uranium gamma, and less than five parts per billion parts of uranium.

Overall uranium losses of 0.03 per cent of the uranium calcined were sustained to the condensate, accounting for nearly all of the low activity waste uranium losses. These low losses were realized by using E-D-1, overhead to T-D-4 fractionator, almost exclusively.

Routine acid recovery operations produced 900 pounds of 100 per cent nitric acid, in about 35 weight per cent solution, for each ton of uranium calcined. About 0.77 per cent of the uranium calcined was returned, with the recovered acid, to Tank Farm blending operations.

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Pot Foaming

The major processing problem during the period continued to be foaming in the calcination pots requiring pot skin temperature, T-C-1, settings as low as 250 C. All efforts to minimize foaming, by reducing holdup time between TBP solvent extraction and steam stripping at optimum vapor to liquid ratios, resulted in little improvement. Some alleviation of foaming was realized through the use of Dow-Corning AF Emulsion, even under severe foaming conditions, and a sufficient amount of this agent has been procured for test in about 150 electric pot calcinations. It is expected that, at best, only temporary relief may be realized through the use of anti-foam additives to pot feeds and that the ultimate solution to the foaming problem may be to steam strip TBP solvent extraction processed product within the first three to six hours after production.

Reactivity Testing

Reactivity improvement testing continued with the production of four carload lots processed at 0.06 weight per cent sulfamic acid additive. Available test carload reactivity data are 1.19, 1.26, and 1.19 for the first three carloads with the higher reactivity of the second carload corresponding to processing nearly 100 weight per cent UNH, vice about 90 to 95 per cent in other cars, as pot feed. Additional testing of the effectiveness of higher agitator torque in overcoming caking difficulties during sulfamic acid additive addition was carried out, in Pot No. 8, using a 20 revolution per minute (vice 37.5 r.p.m. standard) agitator drive. A long time cycle, about 8.5 hours, was noted but it is not definitely established that the long cycle and slow agitator speed are related since one other pot, No. 18, operating at a 37.5 r.p.m. agitator speed, has about an equivalent cycle. Some eruptions of powder and fumes currently under investigation, occurred during calcinations of UNH containing 0.08 weight per cent sulfamic acid in Pot No. 8.

BISMUTH PHOSPHATE PROCESS TECHNOLOGYScavenging of First Cycle Waste

The scavenging of first cycle waste by the addition of nickel ferrocyanide has been postponed until additional data has been obtained in the laboratory to indicate the best method of disposing of the coating removal waste which, currently, is being mixed with the first cycle waste. The operational costs of the waste evaporator versus the proposed scavenging method costs are also being reviewed. The preliminary sketches of an in-line pH meter has been prepared and a cost estimate of the installation will be forthcoming soon.

Special 200 MWD/T Metal

A total of thirteen runs were processed through the canyon and concentration buildings in accordance with Production Test 200-2 ("Processing of Special, Irradiated Uranium," under preparation) using uranium which had been carefully irradiated at 200 MWD/T in "C" File. The overall plutonium material balance across the Bismuth Phosphate process for the 19.4 tons processed was 94.4 per cent. This material is undergoing special processing in the Z Plant to evaluate neutron emissivity after conversion into metal.

Dissolver 3-5L

Installation of the third dissolver (3-5L) was completed on August 17, 1954. A total of fourteen dissolvings has been processed through the new dissolver with no abnormal processing difficulties.

D-1 Tank Failure

An inspection of the interior of the D-1 tank which failed at 224-T revealed mild, general corrosion on both plate and welds. The welds, however, were the most seriously affected with both crater corrosion and knife-line attack present. The bottom gusset plate of each vertical baffle was completely separated from the baffle by corrosion of the joining weld.

Z PLANT PROCESS TECHNOLOGY (ISOLATION, PURIFICATION AND FABRICATION)231 Building Isolation (Task I)

The aluminum nitrate concentration of F-10-P first cycle peroxide feed solution was increased from 0.5 to 1.0 g/l aluminum when losses to recycle became abnormally high. An improvement in loss to recycle was noted soon after this change was made. The use of elutriated diatomaceous earth filter aid on the N-1 (Nutsche) filter in cell 4 was discontinued on a test basis at the end of July. Acceptable filtration times, product purity and product hold-up in the filter block have been realized to date. The use of "Koroseal" instead of "Teflon" to gasket the plug valve and sample can has caused sample cans to arrive at the customer site in excellent condition.

Hydrofluorination (Task II)

Based upon the color of the fluoride powders, 25.7 per cent of the runs entering Task II required rehydrofluorination. This compares to 15 and 3.6 per cent rehydrofluorinations for June and July, respectively. The percentage of totally pink powders during August was 32.4 as compared to 55 per cent in June and 25 per cent in July. Double batches accounted for 89 per cent of the runs.

Reduction (Task III)

The plutonium yield from the reduction of plutonium fluoride powders in Task III averaged 98.7 per cent. The average yields for June and July were 97.5 and 98.2 per cent, respectively. The observance of high pressure has continued through this period even though the furnaces are being heated prior to loading with a charge if they have been idle for 16 hours or more. In two instances pressures higher than have been observed recently were encountered (viz. 280 and 300 psi).

Casting (Task IV)

No machining rejects occurred during this report period.

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Installation of the briquetting hood and press has been completed. This eliminates the need for transferring turnings to the RG Line for briquetting thus reducing the hazard involved with handling turnings. Also by briquetting turnings as soon as practical after they are formed storage and handling of turnings can be kept to a minimum.

Quality Control and Final Inspection

The only rejection in final inspection this month was caused by a blistered coat on the secondary surface. Coating quality as determined by autoradiographic inspection continues to improve. Improved coating distribution resulting from the circulating gas coating process and improved polishing techniques have caused the improvement.

IN-LINE INSTRUMENTATION

The LBU-2DU gamma monitor was delivered to the Redox Plant, where explosion proofing of the scintillation detector and assembly and wiring of electronic components was completed during the month.

Laboratory tests showed that 31 per cent of residual Zr-Nb activity could be removed from the glass sample cell by a single wash with a one-half-sample-cell volume of a cold solution of five per cent sodium hydroxide and 1.5 per cent hydrogen peroxide. A second wash reduced the activity to 57 per cent of its original value. Thus it appears that it should not be difficult to maintain a sample-to-background activity ratio of 10 in view of the results of these tests and the observed equilibrium sorption value of 15 per cent of sample activity reported last month.

During August the "A" Line RAF uranium photometer sampler at TBP Plant operated with the lowest plugging frequency of any similar period in the past six months. In July, this sampler was equipped with a solution strainer to protect the unit from plugging by extraneous insolubles in the sample stream.

Schematic installation and wiring diagrams, shop fabrication sketches, and operating instruction for an automatic, demand-type pH instrument were furnished to T-Plant personnel. The instrument is intended for use during the potential neutralization and scavenging of first cycle wastes.

234-5 DEVELOPMENT

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Filter Media from Sintered Machine Turnings

Fine copper turnings, ranging from 0.002 to 0.015 inch in diameter, were compressed and sintered into three discs having void volumes estimated at 58, 33, and 25 per cent, respectively. This preliminary test was performed to evaluate this technique in preparing filter media from a machineable alloy. An alternate technique is needed since porous alloy filter media cannot be prepared from many desirable alloys (e.g., Baker Alloy No. 413) by conventional techniques. Filtration tests on these copper sintered discs using crushed quartz, ranging in particle size from 1 to 75 microns, was used to evaluate the discs. The results of this preliminary test are very promising and are summarized below.

<u>Disc</u>	<u>% Voids</u>	<u>Per Cent Solids in Filtrate</u>	<u>Maximum Particle Size Passed</u>
1	58	100	75 microns
2	33	30	14 microns
3	25	0	None Passed

Work Coil, Task III Replacement

The work coil development has resulted in a design for a work coil which heats the bomb from room temperature to 350 C in 14 minutes at 10 KW input and gives an acceptable (35 C) temperature difference between the vessel wall and bottom. The work performed is reported in document HW-32810 "Coil Design for Task III Replacement Equipment."

Plutonium Peroxide Precipitation: Elimination of Sulfate

Preliminary laboratory experiments indicate that the precipitation of plutonium peroxide in the absence of sulfate ion is feasible for the processing of F-10-P solution in the 231 Building. The use of strike temperatures of 40 to 50 C gave low losses and precipitates which, while they did not settle as well as those made with sulfate, were easily filterable. Precipitation from solutions containing 3.5 and 5.3 g/l H⁺, at 25 C, gave much improved settling qualities but greatly increases the losses (to 5.3 and 25 per cent, respectively). The addition of

0.03 M oxalate or 0.04 M phosphate, as a substitute for sulfate, was detrimental, causing the formation of fine particles which did not settle.

Plutonium Metal Reactivity Studies

Plutonium metal was exposed to carbon dioxide at temperatures up to 1000 C, with no evidence of a violent reaction. Below 700 C, no reaction occurred; between 900 and 1000 C, the volume of the material increased by a factor of two, due to a slow reaction of unknown nature.

Preliminary experiments have shown that the presence, in the metal reduction operation, of a small quantity of water in a reduction crucible results in the formation of a highly reactive layer on the plutonium button.

Recuplex Feed Preparation - Precipitation in F-10-P

The solids which precipitate from F-10-P solution during storage have been identified as variable mixtures of plutonium(IV) fluoride and plutonium(IV) phosphate, the relative quantities depending upon the original fluoride, phosphate, and acid concentrations. The formation of such solids, the presence of which cannot be tolerated in feed to the Recuplex Solvent Extraction columns, can be prevented by increasing the acidity of the solution and adding aluminum nitrate. Simulated F-10-P, which contained one gram per liter phosphate and two grams per liter fluoride, was completely stabilized against precipitation by the presence of 4.6 g/l H^+ and 0.35 M Al^{+3} .

Recuplex Processing Schemes

A study of the adaptability of the Recuplex facility to the "4X" Program has been completed and a report on this subject is under preparation. Four schemes of processing are conceived: (1) restrict solvent extraction in the 234-5 Building (Recuplex) to the preparation of low MWD/T solutions for off-site shipment, return supernatants and other readily recoverable solutions from high MWD/T processing to the parent plant for recovery, and either store slag and crucible and powder wastes for future recovery or ship them off-site for recovery; (2) process low and high MWD/T streams alternately through the Recuplex facility on an approximately monthly cycle (this approach requires (a) an extensive storage system for storing F-10-P and/or Redox 3BP during the period when utilizing Recuplex for recovery of high MWD/T waste and (b) recycle of supernatants to the parent plant when processing low MWD/T plutonium). Storage requirements are reduced if a variance of this scheme is employed whereby Bismuth Phosphate F-10-P Solutions is processed through Redox, giving a more concentrated plutonium solution. This step is undemonstrated); (3) employ both the Recuplex facility and the 231 Building for the parallel processing of the high MWD/T wastes and the low MWD/T product solutions, respectively; and (4) construct a new, small scale solvent extraction unit within the 234-5 Building, permitting the parallel processing of the high MWD/T wastes and the low MWD/T product solutions. Under any scheme, minimum additional expenditures (\$50,000 - \$75,000) are required to revise present criticality limits on certain vessels to permit processing low MWD/T product solutions in Recuplex. It was concluded that in view of the potentially short term nature of the "4X" program and the subsequent acceptance of expedencies that will avoid large capital expenditures, efforts in adapting the Recuplex facility to two product operation should

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be directed primarily toward processing low MWD/T solutions and the sub-division of the 231 Building. Thus, Scheme 1 is favored. Since, however, Scheme 1 also includes the procurement of additional storage capacity, either in the form of additional FR cans or in the form of permanent storage stations, it is suggested that it may be desirable to include suitable storage provisions to potentially permit alternate processing of both low and high MWD/T plutonium in accordance with the variance of Scheme 2.

Recuplex Construction

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building is approximately 60 per cent completed. Installation of all the vessels for the solvent extraction hood has been completed and approximately 90 per cent of the process valves for the three main hoods have been installed.

ANALYTICAL LABORATORIES

General Chemical Laboratory - Work submitted to this laboratory was far in excess of the normal volume and resulted in assigning personnel from other laboratories within the Unit to assist in meeting rush requirements. Analyses were run in support of seven investigative processes, plus miscellaneous customer samples. A sizeable backlog of work remained at month end.

Radiochemical Laboratory - The ORNL method for U^{233} assay by alpha counting has been confirmed. It appears that X-ray absorption analysis will be feasible for evaluating uranium or thorium occurring with fission products comparable to present dissolver solution proportions. Suitable absorption curves have been prepared for both elements. A second Gamma Ray Energy Spectrometer is now in operation in the Radiochemical Laboratory.

Spectrochemical Laboratory - The arc method referred to in last months report for the determination of beryllium has been extended to cover the range of 0.5×10^{-9} to 10×10^{-8} grams Be. The method employs barium chloride as a carrier. To date it appears that this carrier is effective for chloride, nitrate and sulfate salts of beryllium. Impurities in a thorium matrix are determined by the same methods as for a uranium matrix. At present the sensitivities are about the same for both type samples.

Mass Spectrometry and Water Quality Laboratory - Analytical support of the Mint program was terminated on August 13. The sampling lines were vented to helium and the C-N Spectrometer is now available for other work. An investigation is underway to determine the spectrum of tributyl phosphate prior to, and after irradiation. The new iron procedure referred to in last months report continues to show promise as an improvement over existing methods.

Work volume statistics for the Analytical Laboratories are as follows:

	<u>July</u>		<u>August</u>	
	<u>Number of Samples</u>	<u>Number of Det.'ns.</u>	<u>Number of Samples</u>	<u>Number of Det.'ns.</u>
<u>Research & Development</u>				
Applied Research	610	1636	1193	4212
Pile Technology	143	573	169	445
Fuel Technology	15	439	47	599
Separations Technology	217	634	673	1078
<u>Process Assistance</u>	194	1109	291	2092
<u>Others</u>	54	274	130	732
<u>Total</u>	1233	4665	2503	9158

	<u>July</u>	<u>August</u>
<u>Standards and Calibrations</u>		
Number of standard solutions prepared	34	26
Stock solutions dispensed	67	67
Number of calibrations performed	3	2
Number of calibrated glassware dispensed	0	0
Number of checked glassware dispensed	5	67
<u>Total</u>	109	162

INVENTIONS

All persons engaged in work that might reasonably be expected to result in inventions or discoveries advise that the 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 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 10, 1954

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APPLIED RESEARCH SUB-SECTION

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VISITORS AND BUSINESS TRIPS

- B. R. Hayward and C. C. Woolsey, North American Aviation Corp., Downey, California, visited Hanford August 16-19 to discuss fuel element programs.
- A. Chetham-Strode, Jr., University of California Radiation Laboratory, Berkeley, California, visited Hanford August 17-20 to discuss transuranic chemistry.
- M. J. Feldman, Oak Ridge National Laboratory, Oak Ridge, Tennessee, visited Hanford August 26-27 to inspect and discuss radiometallurgy facilities.
- V. R. Thayer and J. W. Morris, DuPont Company, Savannah River Ordnance Plant, Aiken, S.C., visited Hanford August 16-18 and August 16-20, respectively, to discuss ruthenium problems.
- G. W. Watt, University of Texas, visited Hanford August 16-20 as a consultant.
- T. J. E. Glasson and G. E. Martin, KAPL, visited Hanford August 31 to discuss in-pile coating loops.
- T. W. Evans spent August 2-3 at Phillips Petroleum Co., Idaho Falls, Idaho, to observe start-up of an in-pile experiment.
- W. E. Roake spent August 4 at Mallinckrodt Chemical Co., St. Louis, Mo.; August 5 at the National Lead Co., Cincinnati, Ohio, August 6 at the ANP Project, Lockland, Ohio; August 9-10 at Sylvania Electric Products Inc., Bayside, N.Y.; August 11 at the New Brunswick Laboratory, New Brunswick, N.J.; and August 12-13 at the Metal Hydrides Co., Beverly, Mass., discussing oxide reduction and oxide ceramics.
- D. C. Kaulitz and R. E. Hueschen visited the University of Michigan on August 2 to discuss creep testing apparatus and techniques, and the L. H. Marshall Co., Columbus, Ohio, August 3-5, to discuss a new type elevated temperature testing unit for irradiated materials.
- S. H. Bush visited General Metals Co., Oakland, California, August 12, to inspect pump casings intended for Hanford use.
- G. W. Stuart, Jr., spent August 19-20 at Brookhaven National Laboratory, Upton, N.Y., discussing reactor physics; August 23-27 at KAPL attending a theoretical physics conference; and August 30 at the GE AGT Project, Evansdale, Ohio, discussing the application of a 701 calculator to pile physics.
- H. Neumann and E. D. Clayton attended the theoretical physics conference at KAPL August 23-27.
- D. C. Kaulitz visited the Byron Jackson Co., Los Angeles, California, August 23, to approve engineering drawings on a high pressure water loop.
- B. R. Leonard attended a meeting of the Nuclear Cross-Section Advisory Group at Phillips Petroleum Co., Idaho Falls, Idaho, August 26-27.

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ORGANIZATION AND PERSONNEL

Personnel totals as of August 31 were as follows:

	<u>Exempt</u>	<u>Technical Graduates</u>		<u>Non-Exempt</u>	<u>Total</u>
		<u>Permanent</u>	<u>Rotational</u>		
Physics Unit	28	2	0	7	37
Metallurgy Unit	43	1	2	25	71
Chemistry Unit	49	1	1	15	66
Administration	<u>1</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>5</u>
Total	121	4	3	51	179

PHYSICS

Lattice Physics

One possible method of achieving higher exposures with uranium fuel slugs is to increase the surface to volume ratio of the slugs, thereby lowering their internal temperatures and thermal stresses. This possibility is being explored in some detail by the Design Section and in order to assist them, the following calculations have been carried out. Diffusion theory formulas were fitted to experimental buckling data for lattices utilizing 0.925 inch diameter slugs. These were then applied to calculate the lattice constants of lattices with 0.90 inch outer diameter, 0.25 inch inner diameter hollow slugs. Some enrichment was to be used to raise the buckling to usable levels. This was chosen to be 0.8% U-235.

The results of these calculations are as follows. The cross over lattice spacing (where the addition of cooling water produces no change in buckling) for these slugs is 4.9 inches. At a spacing of 4.5 inches the buckling is $145 \times 10^{-6} \text{cm}^{-2}$ and drops to about $98 \times 10^{-6} \text{cm}^{-2}$ (i.e., about 1000 in-hours) when the cooling water is removed. At five-inch spacing the buckling is $155 \times 10^{-6} \text{cm}^{-2}$ and rises to $108 \times 10^{-6} \text{cm}^{-2}$ on removal of cooling water. The conversion ratio is 0.77.

Thus, this design appears to have the advantages of being capable of high power density operation and of being safe. There may, however, be drawbacks which, at the present time, cannot be definitively outlined. These are i) the low conversion ratio may lead to reactivity changes with exposure that are inconveniently large and ii) the small tube size allows little latitude for the substitution of a lower gross density uranium alloy or other fuel element modification, should this be required to achieve the desired high exposure.

An eight-foot stack of the seven-inch lattice has been erected in the 326 Building. Provisions have been included in this lattice for measuring the buckling of a lattice in which the fuel consists of a cluster of several small diameter rods. Intracell traverses have been made in the 8-3/8 and 6-3/16 inch lattices with the strong neutron source. These measurements have revealed an axial asymmetry in the cell which had not been heretofore observed. The reason for the asymmetry is not known and further investigation is being made. It is possible that previously measured buckling values may be affected.

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Nuclear Physics

The calculations on the variation of Pu-240 content in pile produced plutonium with pile operating temperature have been completed. Results on the local variation of this quantity with temperature had been reported previously. The results for an entire pile, of course, are qualitatively the same. Typical values are shown in the table below:

<u>Exposure in MWD/T</u>	<u>% Pu-240</u>	
	<u>for T = 600°K</u>	<u>for T = 700°K</u>
200	1.63	1.80
600	4.70	5.25

The temperature T which is used in the calculations should be approximately the same as the graphite temperature. The recently observed increase in Pu-240 content in product plutonium is of the magnitude predicted by these calculations; we may therefore tentatively assume that this increase is due to higher graphite temperatures in the piles. Further experimental work with the piles is planned in order to put this conclusion on a sound basis. This work is reported in detail in Document HW-32935 by R. E. Heineman.

The dependence of the burnout and buildup of the various isotopes on pile temperature will affect the long term reactivity changes markedly. Recent calculations on these effects lead to the following conclusions:

- i) the initial rate of increase of reactivity in a pile with exposure increases substantially with increasing neutron (or graphite) temperature and
- ii) the graphite temperature coefficient of reactivity increases with the average exposure of the metal in a pile.

These results, which are to be investigated further, are of use in predicting critical configurations under changing operating conditions. A more detailed description is given in Document HW-32934.

The total neutron cross-section of U-235 was measured as a function of neutron energy in the range 0.025 ev to 0.5 ev. The fission cross-sections for U-235 and Pu-239 were measured in the range 0.025 ev to 2.5 ev. The data obtained on σ_f (Pu-239) indicate a higher value at the resonance than has been reported previously by other investigators. The existence of a resonance level at negative energy has also been determined. The data obtained on U-235 have been analyzed to determine the variation of $(1 + \alpha)$ as a function of energy. It was found that $(1 + \alpha)$ is constant to within about 1% in the range 0.025 ev to 0.1 ev; from 0.1 ev to 0.3 ev, $(1 + \alpha)$ increases by about 10%.

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CHEMISTRYPurex

The need for increased chemical processing capacity at HAPO has motivated a reconsideration of the use of carbon tetrachloride as a Purex diluent. This reconsideration is made possible by favorable data obtained in regard to solvent radiation damage since the original scoping of the Purex plant in 1952. A two-cycle Purex flowsheet has been prepared which would permit 35 tons per day instantaneous processing capacity with 200 MWD/T feed by replacing columns and rearranging some equipment, namely, the intercycle concentrators. The flowsheet has been prepared and documented (HW-32924) to provide a basis for a detailed study of the engineering feasibility and estimation of installation time and costs. Attainment of a Purex production capacity of 35 tons per day -- assuming adequate dissolving facilities can be made available -- should (1) permit the shutdown of both the B and T Bismuth Phosphate plants, (2) eliminate the need for the proposed TBX plant, (3) permit shutdown of the Redox plant, and (4) permit continuation of the Uranium Recovery operations.

Radiation stability tests of carbon tetrachloride in tributyl phosphate solutions have been carried out in the 100 Area pile basin. It has been found that the chloride yield is (1) reduced by a factor of two upon removing dissolved oxygen and water from the carbon tetrachloride before irradiation, (2) increased by approximately 50% in the presence of nitric acid, and (3) increased by approximately 150% in the presence of uranium. An exact correlation between the chloride yield and the uranium or nitric acid concentration could not be found. The highest chloride yield observed was 0.20 g Cl⁻/watt-hr, or 0.76 g Cl⁻/liter at an irradiation level of 7.6×10^5 R, in a 40% TBP-CCl₄ solution containing 189 g/l U and 7.2 g/l HNO₃. Using these data, it is possible to show that the HAW stream from a Purex plant -- operating at 20 tons per day with carbon tetrachloride diluent and 400 MWD/T 90-day cooled feed -- would contain about two parts per million chloride ion.

If monobutyl phosphate were to form rapidly in the HA and LA Purex columns at elevated temperatures (70 C), increased plutonium losses would be observed in the HAW and LAW streams. To determine the rate of monobutyl phosphate formation, a uranium-nitric acid solution was contacted at 70 C with an organic phase containing tributyl phosphate. Samples of the aqueous phase were removed at intervals, spiked with plutonium, and extracted three times with fresh 30% TBP-Ultrasene. Over a period of one to 8.5 hours the plutonium distribution coefficients increased, indicating there would be no additional loss of plutonium to the aqueous waste due to monobutyl phosphate formation.

Thorex

Head-end scavenging of protactinium from Thorex feed solution is being investigated in an attempt to avoid the problems of solvent radiation damage and protactinium recovery in the TA column. A fluoride-free tracer solution was prepared for this study by electrochemical dissolution of thorium irradiated for just one day. Ninety percent of the protactinium and most of the thorium and FPE remained in an insoluble oxide residue, but the supernate was recovered for scavenging experiments.

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Carrying of protactinium from this low thorium-fission product solution was 30, 90, 99, 99, 99.5, and 99.95 percent when scavenged with niobium oxide, Super Filtrol, thorium iodate, zirconium phosphate, manganese dioxide, and ceric iodate, respectively. These preliminary results appear very promising; carrying of 90 percent or higher corresponds to a U-233 loss of but 0.2 percent or lower since only 2 percent of the U-233 remains as protactinium in 90-day cooled material. Similar scavenging experiments using simulated TAF feed (high thorium concentration) are in progress.

Back-salting of protactinium by thorium in the organic phase is under investigation as a possible means of improving product stream decontamination from protactinium. As a preliminary, the distribution of thorium at high concentrations is being determined over the range 0 - 5 M HNO_3 in the aqueous phase and 15 - 60% TBP in carbon tetrachloride. Initial measurements have been somewhat obscured by what appears to be a slow rate of thorium transfer from the organic phase.

Uranium Recovery

The uranium product stream from the TBP plant RC column is steam stripped to remove entrained and dissolved tributyl phosphate. However, the RCU is stored from 12 to 24 hours before stripping. Any hydrolysis of the tributyl phosphate prior to steam stripping results in the contamination of the uranium product with dibutyl phosphate which is not removed by the stripping operation and is well known to initiate foaming during UNH calcination. Analysis of a X-19 sample (100% UNH) during a period of pot foaming indicated a dibutyl phosphate content of about 25 parts per million. A concentration of 20 parts per million is sufficient to cause foaming during calcination. Analyses of RCU samples showed a lower dibutyl phosphate concentration and indicated, therefore, that significant amounts of tributyl phosphate had hydrolyzed during storage prior to steam stripping.

Laboratory experiments have been performed to measure the rate of tributyl phosphate hydrolysis in solvent saturated RCU at 50 C. The dibutyl concentrations observed after six and 24 hours were up to 10 - 20 ppm and 20 - 50 ppm, respectively. Although these data are subject to a large uncertainty in the analytical determination and to a variation over duplicate runs, there seems little doubt that the RCU should be steam stripped as soon as possible after leaving the RC column.

The TBP plant ROC and RCW streams have been analyzed for dibutyl phosphate, and in both solutions the values obtained were near the limit of detection of the analytical method. Further, since the dibutyl phosphate content of the ROW stream is also quite low, it appears that very little dibutyl phosphate is present in the solvent or formed during the extraction process.

It is of interest to know the behavior of any dibutyl phosphate present in the RC column. Dibutyl phosphate distribution measurements were made at 25 C with various concentrations of DEP in 20% TBP in Shell Spray Base between H_2O , 0.01% RCU, 1% RCU, and 100% RCU. The results thus far show the dibutyl phosphate to favor the organic phase only slightly at the top of the column and strongly at the bottom ($E_{23}^0 \approx 100$). Poor analytical results prevent one from saying definitely that pinching of the dibutyl phosphate may be occurring. The implications of these data are potentially in conflict with the aforementioned analyses of plant streams. A solution of the matter is planned.

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The development of an analytical scheme which will permit analysis of plant RAX or RCW for organic impurities is continuing. Concentration of impurities by vacuum distillation followed by multiple chromatography appears most promising. In this manner positive identification has been made of tributoxylethyl phosphate.

Bismuth Phosphate

Methods for accelerating uranium metal dissolution are being studied since the dissolving step is one of the factors limiting separations plants' processing capacity, especially for low g/T material. Preliminary nitric acid dissolving experiments have involved the addition of sulphuric acid and/or phosphoric acid which are known dissolution catalysts and are added in any event in the extraction step of the Bismuth Phosphate Process. The dissolving rate of the first quarter of 1/4-inch thick uranium wafers has been found to be increased 1.5, 2.1, 2.8, 1.4, and 1.7-fold relative to that with 10 M HNO₃ alone by the addition of 0.5, 1, 2 M H₂SO₄, 0.1 M H₃PO₄, and 0.1 M H₃PO₄ plus 0.5 M H₂SO₄, respectively.

Isotope Separations

Analytical results for several isotope separation runs using the thermal zone melting method have been obtained. A uranyl nitrate run showed an enrichment of U-235 over U-238 of 5.9 percent; a similar run with uranyl perchlorate gave 7.4 percent. These results are poorer than expected and may have been caused by the fact that the melted zone lengths in these runs were longer than those in previous experiments. This would lead to fewer stages of separation.

A thermal diffusion column run using aqueous uranyl nitrate solution has been completed. The results were promising but not clear-cut. An apparent separation of 19 percent U-233 tracer to U-238 was observed after 20 days' operation of the column; however, the tracer concentration also increased at the base of the column during the run. This last result was unexpected, and its significance is not clear. A duplicate experiment is now in progress using a somewhat modified apparatus.

Ruthenium Studies

The possibility of improving ruthenium decontamination of the product uranium oxide by sparging with ozone during calcination is under investigation. In a control experiment using air as spargant and unheadended concentrated LCU, ca. 60 percent of the ruthenium volatilized during the period of nitrogen oxide gas evolution, 15 percent volatilized thereafter. The resulting ruthenium DF of four is comparable to that achieved in the plant.

Modifications of head-end treatment under study with the objective of minimizing ruthenium volatilization while maintaining required ruthenium decontamination include low temperature operation, a manganese dioxide reverse strike precipitation under acid-deficient conditions, and the use of organic reductants. Ruthenium carrying as high as 70 percent has been achieved with only 0.1 percent volatilization using a reverse strike with 0.02 M MnO₂ at 55 C and 0.3 M acid deficiency, followed by acidification to 0.1 M acid to convert the manganese dioxide to the quick settling form. Also, addition of two volume percent acetone or diethyl ketone has been shown to reduce ruthenium volatilization during a two-hour digestion period by ten-fold.

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Further study will be directed toward establishing the solvent extraction behavior of the remaining ruthenium in Redox and Purex systems and toward improving the ruthenium carrying, as required.

In-Line Analysis

Both six-point gamma consoles for the Hot Semi-Works in-line monitoring installation were completed in the shops and tested during the month. As a result of extensive performance tests, several minor circuitry modifications have been made. The three Master Programmer switches and the consoles for pH and uranium photometry and polarography are about 80 percent complete in fabrication. In addition, sufficient cell bodies, frames, and lead shields have been fabricated to meet the immediate needs for the gamma sensing units. Several 2-inch, 1-inch and 1/8-inch diameter lucite gamma cells have been made from these components and mechanically tested. Several 1-inch and 1/8-inch 2S aluminum cell bodies have also been made, and corrosion tests under way with 2S and 24S aluminum in nitric acid solutions indicate that the 2S aluminum cells will have a reasonable life expectancy in nitric acid up to 6 M. Gamma cells of aluminum are desired for certain monitoring installations because they do not develop high cell backgrounds by adsorption of fission products as rapidly as other materials.

A jet sampler mock-up provided by Separations Technology personnel in the 321 Building was used extensively during the month to test Hot Semi-Works in-line monitoring equipment. Tests were conducted with gamma cells, degassers, and associated plumbing, check valves, auxiliary sample hold-up cup, and a uranium photometer cell. The jet sampler operated on a 1.3 M uranyl nitrate⁶ solution with about a 25-foot lift with air injection. The most significant mechanical problems were the failure of check valves and plumbing leaks resulting from improperly assembled tube fittings. The plumbing required for the in-line pH monitor is being assembled and a prototype pH cell of a new type is being made. Several models of uranium polarograph sensing units are ready for test in the 321 Building mock-up.

The problem of nitrite interference in uranium polarography was studied and in order to avoid the problem of introducing liquid reagents to the sample, a technique of sweeping a reagent in as a vapor in the helium gas sparge stream was studied. Reagents tried were several volatile amines and low molecular weight alcohols. The amines reacted too slowly with the nitrite, but primary alcohols eliminate the nitrite in a 3 - 5 min. sparge by formation of a volatile alkyl nitrite. Methyl, ethyl, and isopropyl alcohol are all suitable, and the technique is sufficiently simple to be used in an in-line monitor. Another problem under investigation is an extraneous polarographic wave of unknown origin in Purex type wastes which is associated with the presence of traces of dissolved TEP in the waste solution.

Because several of the difficulties encountered in the use of polarography for in-line determinations of uranium in Metal Recovery and Purex wastes are related to the use of the dropping mercury electrode, an investigation of micro-electrode polarography with other electrode materials has been initiated. In this connection, 18 metals have been tried for the polarographic determination of uranyl ion in a nitric acid matrix. Of those metals which proved to be sufficiently inert in this matrix solution, four (gold, tantalum, platinum, and amalgamated platinum) had hydrogen overvoltages sufficiently high (0.2 to 0.6 volts) to permit the reduction

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of uranyl ion. Of these, the gold electrode looks most promising. In a study of the effects of stirring conditions, surface area, and gas content, conditions have been found for which good polarograms of uranium are obtained with a sensitivity comparable to that of the dropping mercury electrode. A multiple micro-electrode with a combined surface area of about 0.1 sq cm proved to be promising, but a single, large electrode of about the same area failed to yield the necessary diffusion-limited current.

Several grams of thulium metal have been received from the Ames Laboratory for irradiation to produce Tm-170 sources for in-line gamma photometry. Unfortunately, a test irradiation in the 305 pile revealed that the thulium contains a trace of tantalum which activates to Ta-182 having a hard gamma. An attempt to obtain a Tm-170 source from the Argonne Laboratories revealed that a similar experience had been encountered at that site. Since the presence of the hard gamma of Ta-182 is detrimental in our present application, an attempt is being made to obtain a tantalum-free sample of thulium.

Analytical Development

A formal report entitled "The Spectrographic Determination of Uranium Isotopes" was issued as Document HW-32843. This completes the investigation of isotopic analysis methods based on the spectral isotope shift, and the major conclusions were that the photographic method, although better than previously published methods of this type, is not sufficiently precise to displace the present method in use at HAPO, whereas the spectrometer method, using a commercially available direct reading instrument, is sufficiently precise to offer a great saving in analytical time over the present method.

Because of the renewed interest in the dibutyl phosphate content of process solutions concurrent with pot foaming problems in the Uranium Recovery plant, a study of the "disengaging time" method for dibutyl phosphate was made in order to improve reliability. The problem of coagulation of the zirconyl phosphate reagent was solved by an alteration of the preparation technique. In addition, a solution for the problem of poor sensitivity from some batches of reagent appears to lie in the pretreatment of the zirconyl nitrate used to make the reagent. A batch of zirconyl nitrate which was consistently yielding a poor reagent was "sensitized" by a one-hour digestion in concentrated nitric acid prior to use, and with an optimum zirconium to phosphate ratio for a reagent prepared in this manner, the method can now determine dibutyl phosphate to as low a concentration as 0.5 ppm in aqueous solutions. A promising technique for obtaining a 20-fold increase in sensitivity for dibutyl phosphate by a method of successive extractions is under study.

The study of flame source spectrography was completed with the determination of sensitivities for 20 elements of interest in connection with pile and process water purity. In 14 cases, usable sensitivities are obtained, but in general the sensitivity is no better than flame photometry, and since in the case of some elements of particular interest in pile water analysis, such as aluminum and magnesium, the sensitivity is too low, it was concluded that flame spectrography offers no advantage over present analytical methods. Future work along this line will be with the porous cup technique, which is quite promising judging from the data of other investigations.

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A new method for the determination of iron in pile water is under test in a technical service laboratory. The method consists of the solvent extraction of a colored ferrous complex with a reagent known as bathophenanthroline at a pH of about 4.5, followed by a spectrophotometric measurement of the ferrous complex in the organic phase. The method is potentially valuable because of its high precision and a sensitivity of about one part per billion without concentration of the water sample.

The reason for the uranium interference in the coulometric determination of plutonium in dissolver solution that was reported last month was found. The uranium interferes in the nitric acid oxidation of the formaldehyde used to remove excess permanganate and manganese dioxide in the oxidation step. The mechanism of the interference is probably the complexing of nitrite by the uranium; a small amount of nitrite must be present for the rapid reaction of nitric acid and formaldehyde. The interference is readily overcome by the addition of more nitric acid.

The use of anionic ion exchange resins for the separation of elements by use of complexing anions is under investigation for the separation of heavy elements. In 6 - 12 M nitrate solutions with a Dowex 1, 2 percent cross linked resin, Np(IV) and Pu(IV) are retained by the resin; Am(III), Cm(III), Pu(III), and the rare earths pass through in one column volume of nitrate wash. Uranium(VI) holds up slightly but can be eluted in about three column volumes. A separation of plutonium and neptunium is easy to make, the addition of ferrous ion and hydroxylamine to the nitrate solution leaves neptunium on the column, and the plutonium elutes in one column volume. This separation will be feasible to use to process the Berkeley "napkin ring" solution for americium and curium and to prepare neptunium stock solutions. The separations are also suitable for use in the Np-239 cross-section experiment.

Miscellaneous analytical activities included a determination of the volume, pressure, and composition of gas in a large void within a hot-press canned simulated slug. By special techniques devised for the work, it was possible to show that the gas existed under a pressure of about two atmospheres in the void and the composition was about 75 percent hydrogen, with various hydrocarbon gases, their pyrolysis products, and air making up the remainder.

Technical assistance to the various process control laboratories included the correction of a faulty method for calculating boron in plutonium, assistance in improving the standardization procedures for the light scattering method of pile water turbidity, troubleshooting in maintenance problems with an x-ray photometer, and assistance in correcting electronics difficulties with a gamma spectrometer.

The standard sample program involved 116 determinations from 100 and 200 Area service laboratories. These included test samples of process water, uranium in RAW and 3EU samples, nitric acid in 3EU, plutonium and total alpha in PR, and five impurity elements in UO₃. The results were good except for some fliers in the process water analyses reflecting the training of new personnel and slightly high results for AF in the PR sample.

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Design activities included alterations to the light scattering turbidimeter design prior to the ordering of nine additional units for pile water plant control, and completion of a study of methods to improve the precision of the Purex Model uranium fluorimeter.

Decontamination, Waste Disposal, and Facilities

Decontamination of the cubicle room 1-F, Building 222-S, was completed. Maximum V.G.M. survey readings inside the cubicle are now less than 40,000 c/m. All associated equipment has been decontaminated or discarded, and the cubicle has been reassembled for use.

Manufacturing Department personnel requested the use of one of Technical's 5000-gallon waste trailers. The trailer was needed for the emergency transportation of waste generated in the cleanup of silica gel absorbers at the Metal Recovery plant. The trailer was used for this purpose and will be returned to the Chemistry Unit's control during the first part of September.

Modification of the vacuum air sampling system for the Radiochemistry Building was completed. Changes had been necessary to limit vibration of the exhaust ducts in the emission spectrometry laboratories. Radiological Sciences Department will now be able to take room and duct samples directly without resorting to the use of portable moto-air samplers.

Modifications to the Paint Spray booth in the Radiochemistry Building were completed, and the booth is now ready for use.

Modification of the decontamination rooms 4-7B and 4-7B₁ in the Radiochemistry Building was started. Changes had been initiated so that a portion of the decontamination area might be released for conversion to a mass spectrometry laboratory and a high fission product level laboratory.

A dishwasher for use in decontaminating laboratory glassware was received and is being installed. This machine will remove the need for frequent handling of numerous small pieces and will result in more efficient service and greater economy of operation.

A large leak in the retention waste line was discovered in the vicinity of 340 Building. Maintenance forces excavated and repaired the line.

A contaminated cask which had been stored in Building 3722-A for several years was buried.

Eighty thousand gallons of "crib" level waste were transported to 200 West Area for disposal to crib. This represented an increase of 50% in volume over previous months. A review of crib waste sources showed the increase was due primarily to the use of certain water aspirators in the Radiometallurgy Building. Spring-loaded valves are being installed on these aspirators to limit the volume of water going to "crib" tanks from this source.

One million gallons of retention "level" waste were processed to ground. All other decontamination and building functions were accomplished in a routine manner.

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METALLURGY

Irradiation Effects on Uranium

Small, thin specimens of uranium have been exposed for 1, 5, and 24 hours, and for 14 days at a water temperature of approximately 35 C to minimize recovery of irradiation damage. X-ray examination of the sample exposed for 14 days in a thermal neutron flux of 1.3×10^{13} nvt reveals radiation damage. This exposure corresponds to approximately 50 MWD/AT. The damage is typified by a shift in the diffraction peaks to lower angles together with some distortion and broadening of these peaks. These results indicate an increase in the crystal lattice spacings and the presence of crystallographic imperfections. Previous examinations of wafers cut from a normal uranium slug exposed to 1000 MWD/T revealed similar damage, but no such damage was observed in a slug exposed to 600 MWD/T. Apparently, there are two effects, one temperature dependent and the other integrated flux dependent. Short exposures at the elevated temperatures occurring in a slug do not result in observable damage due to annealing effects; however, longer exposures result in observable damage. Specimens exposed under conditions limiting the maximum uranium temperature such as was true in the small wafer exposed to 50 MWD/AT still show damage under x-ray examination because annealing did not occur.

The first four zirconium capsules containing uranium-magnesium fuel material will be discharged from the MTR facility on September 6, 1954, after receiving an accumulated exposure of approximately 2.6×10^{20} nvt. This is equivalent to about 1000 MWD/T. Two of these specimens contain a matrix material of Mg - 1.4 weight percent Si and two contain a matrix of pure magnesium. After discharge, they will be shipped to Hanford and examined in the Radiometallurgy Building.

Zirconium Metallurgy

The first series of zirconium specimens from PT-105-509-SI, "Effects of Irradiation on the Mechanical Properties of Zirconium," were discharged after 190 MWD/AT at 50-60 C. Tensile data, reported previously, have been supplemented with hardness data. Irradiation increased the hardness by 31, 20, 19, 17, and 11 percent for specimens initially cold worked 0, 10, 20, 30, 40, and 50 percent, respectively.

A zirconium specimen that had grown 0.239 percent after three days in air at 650 C was sealed in an evacuated quartz tube, then heated four days at 650 C. The white oxide formed during the heating in air was dissolved during the subsequent heating, but a residual dark layer still remained on the metal. This change occurred with no change in length of the specimen. Subsequently, the specimen was again sealed in quartz and held at 800 C for several days. Slight (0.035%) growth occurred, but the surface did not regain its initial bright appearance as was the case when Zircaloy-2 was exposed in the pile at elevated temperatures.

Volume and density measurements have been completed on Zircaloy-2 specimens exposed in F-pile. These specimens were in a graphite channel in an atmosphere consisting of 90 percent carbon dioxide, 10 percent helium at about 650 C. A decrease in density of 2.42 percent occurred and the volume increased approximately 5 percent.

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Conditions have been tentatively established under which known amounts of hydrogen can be added to zirconium or Zircaloy-2 without affecting the grain size. One hour at 500 C is sufficient to cause complete homogenization of the added hydrogen with no marked grain growth.

Metallurgical Techniques

The study on the effect of water penetrating a Zircaloy-2 capsule and reacting with NaK and uranium has been completed. Additional tests were conducted after enlarging the hole from 0.010-inch to 0.015-inch. The capsule was again autoclaved at 190 C for 144 hours. The capsule was examined visually, then sectioned. Examination of the unsectioned and sectioned capsule and contents revealed:

- (1) no violent reaction resulting in deformation of the capsule had occurred;
- (2) entry of water into the capsule was a function of the hole diameter;
- (3) ammonia gas was generated during the reaction, presumably by reduction of nitrides in the uranium; (4) the uranium was completely consumed, being converted to a brown spongy mass; (5) there was no evidence of excessive corrosion of the Zircaloy-2 during the total period of 788 hours of steam autoclaving; (6) the residual water in the bomb contained sodium, potassium, uranium, and zirconium as revealed by spectrographic analyses.

Pressure - time - temperature relationships have been evaluated to insure satisfactory bonding of uranium-aluminum couples without excessive diffusion. In the five specimens examined to date the best results were obtained by pressing at 10.6 tsi for one minute at 500 C, then releasing the pressure and cooling for one hour to a final temperature of 50 C. This resulted in a diffusion zone approximately 0.003-inch thick. An examination of one specimen after it was inadvertently fractured revealed marked porosity on the uranium side of the diffusion interface. No explanation is advanced, pending further investigation.

Fuel Element Studies

Twelve solid slugs have been canned utilizing the point closure technique. Two of these slugs have been flow lab tested by drilling a hole in the can wall of one and the cap of the other and exposing them to flowing 120 C water. The slug with hole drilled in the can wall failed after about 90 hours' exposure, having suffered generalized corrosion principally on the side of the slug away from the point of water entry. The other slug had not failed when the test was terminated.

A production test of unbonded, cold-closed slugs is now being circulated for signature. A total of eight such slugs will be irradiated to 200, 400, and 700 MWD/T. After visual examination of the slugs irradiated to 200 MWD/T, a tube charge of 36 cored, unbonded, cold-closed, natural uranium slugs and four cored, unbonded, cold-closed, enriched uranium slugs will be charged in the central zone of C-pile and irradiated to rupture. Canning should be complete by September 3.

Two four-inch mechanically bonded fuel elements with cold closures were included in the August 6 loading of Pile Technology's H-loop. These two pieces occupy a position twelve to thirteen feet downstream from the beginning of the active zone and are currently operating at a specific power of 33 kw/ft with a local water temperature of 125 C. An irradiation period of one month is scheduled for this test.

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The four four-inch mechanically bonded fuel elements which were charged into D-pile July 23, 1953, are currently operating at a specific power level of 32 kw/ft. The first two slugs will be discharged next month.

A comparative analysis of the thermal stress condition in a solid, a cored, and an internally-externally cooled fuel element was made utilizing the method described in HW-31681. This method considers the temperature dependent strength properties of uranium.

For all cases, the tube exit coolant temperature was assumed to be 230 C and the power generation 50 kw/ft. The maximum circumferential stresses and temperature drops in these elements are listed below:

	O.D. (in)	I.D. (in)	Max. Circumferential Stress - psi	Temperature Drop - C
Solid	1.36	0	35,600	350
Cored	1.36	0.5	28,200	240
Internally-Externally Cooled	1.36	0.5	24,900	100

Uranium Reduction Studies

During the period several open crucible type reductions of UO_3 were attempted. Reductants included magnesium, aluminum, and carbon. Aside from the high oxide content of the crucible residues, the greatest drawback was in the lack of sufficient heat to melt the slag and uranium. Several salts were tried as slagging agents but in no case were boosters used. The use of a themite mixture on the outside of the crucible to supply additional heat from the molten iron produced was of some help, but difficulty was experienced in firing the inside and outside of the crucible simultaneously. These experiments were tried in this manner because of temporary lack of bomb facility. The pyrochemical reductions of the oxides have been temporarily abandoned in favor of electrochemical reductions. Several goals have been established as desirable for an electrochemical scheme:

1. UNH, UO_3 , or UO_2 as feed is desirable.
2. Operation in air without special electrode protection is desirable.
3. Vessel construction material must be easily available.

These admittedly difficult conditions are not met by any of the current methods of electrodepositing uranium. No attempt has been made to duplicate the work of Westinghouse or Argonne. Efforts have been spent in finding a bath which will dissolve appreciable quantities of UO_3 . The following baths have been tried:

1. Lithium chloride - potassium chloride eutectic.
2. Sodium meta phosphate and sodium pyrophosphate and mixtures of the two.
3. Vanadium pentoxide, molten.

The chloride baths were not useful for dissolving the oxide. The phosphate baths dissolved oxide to form uranyl phosphates, but electrolysis of these baths yielded a heavy, red-brown deposit on the cathode which reacted with water and acids to

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give phosphine gas and which analyzed about 30 percent uranium. The majority of the deposit appeared to be uranium dioxide mixed with either sodium or uranium phosphide.

Most promising results have been obtained by using molten vanadium pentoxide. Crude phase experiments have indicated that UO_3 will dissolve in molten V_2O_5 a composition of up to at least 50 more percent to yield a bath melting below 600 C and having high electrical conductivity. A trial electrolysis of this bath gave somewhat promising results, as a deposit of what appears to be uranium-platinum was obtained. Further experiments with tantalum electrodes are planned.

A number of precipitations of the $UF_4 \cdot NH_4F$ double salt from UNH solution has been completed. The double salts have been decomposed in vacuo to the tetrafluoride of uranium and this product reduced to the metal. Several concentrations of UNH were employed, including one run with a UNH solution of the approximate concentration of the Redox and Purex uranium streams. In all runs a large excess 175 percent of $NH_4F \cdot HF$ was employed. The amount of bifluoride can probably be reduced to less than 30 percent excess with equally efficient precipitations. A 20 percent excess of ferrous ion, added as ferrous chloride, was employed for reduction of uranyl to plus four uranium. Although all results are not available, waste losses during precipitation appear to be between 0.01 and 0.1 percent uranium. However, during washing with a nitric acid hydrofluoric acid solution, waste losses were as high as two percent. Equilibrium solubilities of the double salt in various solutions will be determined to find a wash solution in which the double salt has a lower solubility.

The products obtained after decomposition contain small amounts of ammonium fluoride which may be the cause of the poor yields obtained upon reduction to metal. It is felt that this can be remedied by a slightly longer and possibly a higher temperature decomposition of the double salt. The tetrafluorides contain about 0.5 percent iron. During reduction to the metal this contamination may be removed. Samples of uranium metal are being analyzed to determine if the iron is separated during reduction or if a more elaborate washing operation will have to be employed. All reductions to the metal were performed in a pot furnace at 1000 C. Booster ratios of 0.4 to 0.6 moles of I_2 per mole of uranium were employed. The button yields were lower than expected probably because insufficient heat was generated from the booster and furnace to keep the metal molten while coalescence occurred. Although as much as 0.26 moles of NH_4F was present per mole of UF_4 , no excessive pressures were obtained during reductions. However, this much volatile material may disrupt the packed charge during firing which would hinder coalescence of a button.

Fuel Element Testing Facility

The MTR Fuel Element Testing Facility went into operation on MTR cycle 40 which commenced on August 1. Operation is continuing smoothly with inlet and outlet pressures of 310 and 250 psi, respectively. The water flow rate is 15 gpm and the observed temperature rise in the water is 14 to 14-1/2 C. Thus, the calculated total power generation in the three four-inch fuel elements (hot press canned solid slug, Al-Si canned cored and solid slugs) is about 55 - 58 kw/ft. Of this total power, an estimated 6 - 8 kw arises because of gamma heating. At the end of the month the specimens have reached about 200 MWD/T exposure.

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Radiometallurgy Examination

Of the four cored enriched slugs irradiated to 1550 - 1600 MWD/T at specific powers of 75 - 79 kw/ft, three have been transferred to the Radiometallurgy Building for examination. The ruptured slug has been photographed and decanned. At the time the can was removed it was found that the can was almost completely unbonded. Only one circular can wall area about one inch in diameter was still bonded. The uranium core was severely cracked, with one wide longitudinal crack and several smaller transverse cracks. A black corrosion layer covered most of the slug. The slug will be sectioned when the cut-off box is available for the purpose. Examination of the remaining slugs will be initiated early in September.

Examination work continued on ruptured type 25M uranium slugs (machined from beta heat treated rods). Rupture #360 which had been classified as a cap type failure was carefully examined. The failure was of an unusual type. It appeared that water had gained entrance to the side wall of the jacket an inch from the base and had proceeded around the periphery of the uranium, causing the jacket to split and separate at the base. The film deposit on the aluminum jacket and the appearance of a button of unidentified material gave the slug an appearance of having been heated to a high temperature. A 1/2-inch thick transverse section revealed that very uniform corrosion attack around the uranium except for about a 1/2-inch length which was unattacked. The diameter of the solid uranium was reduced about 0.050-inch. Electrocleaning in dilute HNO_3 revealed some fine cracks which appeared to fan out into the uranium from the bonded area indicating the existence of high tensile stress normal to the cracks. An interim report showing photographs, length and diameter measurements of selected ruptured and unruptured slugs, and the x-ray study is in progress. Examination of a few other ruptured slugs and a comparison examination of selected slugs from a production test to evaluate beta heat treated slugs from Fernald rolled rods (PT-105-3M) will continue.

The cap assemblies from two of the four enriched aluminum slugs that were canned by the hot press canning technique were examined for possible defects after irradiation to 500 MWD/T under PT-105-562-A. Macroscopic examination indicated that the closure appeared to be sound. The examination is continuing.

Two enriched slugs, A-12 and A-13, which were chemically stripped, and one canned enriched slug, B-5, were received from Pile Technology to qualify the results of the underwater examination. These slugs were selected from a production test that tested relatively thin end caps in a downstream position in Tube 2674C so that local boiling at the end cap would be assured. Detailed length and diameter measurements of the stripped slugs did not reveal any appreciable change as a result of the irradiation, and the slugs appeared sound without any cracks, holes, or deformation being observed. A sample of corrosion product on the aluminum can from the other slug (B-5) was taken for chemical analyses. A report is in progress.

Eight perforated slugs were received that contained samples representing low temperature exposure of uranium to irradiation for pile exposures of 1 hr., 6 hrs., 24 hrs., and 14 days according to PT-105-519-SI. Five perfs were opened and the samples removed. A heavy oxide coating which resisted electrocleaning was observed on several of the uranium samples. The samples were mounted in lucite at room temperature, mechanically polished to remove the coating, and then electropolished prior to making the x-ray diffraction studies.

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Radiometallurgy Facilities and Equipment

The cut-off cell became inoperable on August 6, when contaminated water leaked from the cut-off box and shorted the stator windings of the motor that drives the abrasive cut-off wheel. Replacement parts were received from the manufacturer, and the entire motor assembly was decontaminated and prepared for re-assembly. Minor improvements to the cut-off cell are being made during the enforced down time.

Remote operating equipment that will make precise measurements of the electrical resistivity of irradiated samples was received from the shop. Irradiated sample sizes up to 5/8-inch wide by 7 inches long can be measured with this equipment after the cell installation and calibration is completed.

Separations Plant Corrosion Problems

The study of the effect of changing the solution composition in the H-4 oxidizer on the corrosion rate of various stainless steels which might be used as materials of construction for future vessels has been completed. Types 309SCb and 304L stainless steels were exposed to nine solutions containing various combinations of sodium dichromate and potassium permanganate as oxidants. Some of the solutions contained nitric acid and some were acid deficient. (See HW-30896) In general, the corrosion was more severe in the presence of 0.2 M nitric acid than in its absence. In the presence of 0.2 M nitric acid all of the type 309SCb stainless steel suffered intergranular attack when sodium dichromate was present in the solution. The type 304L stainless steel suffered general attack in these same solutions. In the solution containing 0.2 M nitric acid and potassium permanganate both types of stainless steel resisted attack. When the solutions were made 0.2 M nitric acid deficient, both types of stainless steel resisted attack in the solutions which did not contain potassium permanganate. In the solutions containing potassium permanganate both types of stainless steel suffered severe pitting attack. In summary, it may be said that three of the proposed solutions give acceptable corrosion rates at the boiling temperature of the solutions. It should be pointed out, however, that since all of these exposures were made at boiling temperature, the results are directly applicable only to the vessel shell and not to the heat transfer surfaces.

A failure of Number 19 "Lucky" gas fired calcination pot for calcining nominal 100 percent UNH to UO_3 powder in 224-U Building was detected June 6, 1954, after approximately 250 operating hours. A visual examination of the failure disclosed that a crack had developed in the center of the bottom head of the pot and had progressed through the type 347 plate. The crack occurred at the toe of a fillet weld which attached a sag indicator bar to the bottom of the pot. Several phenomena probably contributed to the failure, such as a stress concentration at the toe of the fillet weld, a temperature differential between that of the plate and the sag indicator bar which would cause high local stresses, a weakened area in the type 347 plate immediately adjacent to the fusion zone of the weld, and the fact that the center of the bottom is the point of highest tensile stress resulting from normal loading. The visual appearance of the crack indicated that it was an intergranular crack indicating that the crack occurred at elevated temperatures. A metallographic examination of the material at the point of failure

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should reveal a more definite reason for failure, and such an examination will be made when the failed section of the bottom of the pot is removed so that it might be replaced to effect repairs to the pot.

In April, 1954, the D-1 precipitator (equipment piece No. 224T 103) in 224-T Building developed a leak and was replaced by the A-1 precipitator from the then inactive 224-B Building. Prior to the repair of this vessel for use as an A-1 precipitator in B plant, the failure was examined. Examination of the exterior revealed that one of the seam welds joining the segments of the dished bottom was leaking through the center of the weld at several points. Since this was the first Bismuth Phosphate Process vessel failure to be examined and since the nature of the leak indicated serious corrosion, an examination of the interior was arranged. All of the welds on the interior of the vessel had been preferentially attacked with respect to the wrought material. The welds below the liquid level (about 30 inches from the bottom) were all corroded to a depth of approximately half the wall thickness. The longitudinal weld seams of a dip leg that had fallen into the tank was completely corroded away leaving a slot the full length of the pipe. The longitudinal welds in all the other dip legs were severely attacked and were corroded away at the bottom. Several of the welds holding baffle gussets to the shell were completely corroded away, and the gussets were laying on the bottom of the vessel. Since this is the first Bismuth Phosphate vessel which has been inspected and since the corrosion is severe, it is recommended that all of the B plant vessels be thoroughly inspected prior to B plant start-up.

Welding Studies

A study is under way to determine a satisfactory joint design for butt welding pipe which will achieve 100 percent penetration of the joint without excessive protrusion. A necessary requirement for such a joint is that it be determinable by visual inspection that an acceptable root (first) pass has been made. One promising approach to the problem has been to design a cross-sectioned configuration of the joint so that a fusion root pass will satisfy the requirements. Preliminary tests have indicated that such an approach may be both economical and successful. Another approach that has been used commercially in an attempt to solve this problem is to place a fusible insert in the joint and employ a conventional beveled edge preparation on the pipe. This joint design is also being evaluated.

A new type AC welder (Miller EA252AP) with automatic gas and water controls and remote current control for tungsten inert gas welding was evaluated to determine its operating characteristics. Several characteristics were noted which make this welder an outstanding machine. The remote current control allows the weldor to adjust the current at any time during welding and to lower the current to fill the weld craters. The arc is very stable, pointed, and penetrating and has an excellent cleaning action. This appears to be an excellent machine for TIG welding of aluminum.

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

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Inventor(s)

G. W. Stuart

A. S. Wilson

Title

A Power Reactor Possessing Excellent Nuclear Stability

The Use of Organic Reagents to Suppress Ruthenium Volatilization During Manganese Dioxide Scavenging of Process Solutions

J. W. Albaugh

Manager - Applied Research
ENGINEERING DEPARTMENT

FW Albaugh:kb

**GENERAL  ELECTRIC
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RICHLAND, WASHINGTON HANFORD ATOMIC PRODUCTS OPERATION

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September 7, 1954

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MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

AUGUST, 1954

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VISITORS AND BUSINESS TRIPS

<u>Name</u>	<u>Date</u>	<u>Address</u>	<u>Purpose</u>
H. Messner	8/24/54	Ohio Crankshaft Co., Los Angeles, Calif.	Inspection of Tocco revision
<u>Name</u>	<u>Date</u>	<u>Place Visited</u>	<u>Purpose</u>
J. W. Riches	8/1-8/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Fabrication of uranium
		Simonds Saw & Steel, Lockport, N. Y.	Same as above
		Bridgeport Brass Co., Bridgeport, Conn.	Same as above
E. A. Eschbach	8/3-6/54	Aluminum Co. of America, Edgewater, New Jersey	Meeting on aluminum quality
O. W. Rathbun	8/7-14/54	Nat'l. Lead Co. of Ohio, Cincinnati, O.	Fabrication of uranium
A. G. Blasewitz	8/17-27/54	KAPL, Schenectady, N.Y.	Fuel element development
		BMI, Columbus, Ohio	Same as above
		Ames Lab., Ames, Iowa	Same as above
E. C. Pitzer	8/17-26/54	KAPL, Schenectady, N.Y.	Coatings & corrosion problems
		BMI, Columbus, Ohio	Same as above
P. D. Wright	8/28-9/4/54	Bridgeport Brass Co., Adrian, Michigan	Fabrication of uranium
J. W. Riches	8/29-9/5/54	Bridgeport Brass Co., Adrian, Michigan	Fabrication of uranium
G. E. McCullough	8/30-9/2/54	Bridgeport Brass Co., Adrian, Michigan	Fuel element technology

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Fuel Technology Sub-Section

ORGANIZATION & PERSONNEL

Personnel totals as of August 31 were as follows:

	<u>Exempt</u>	<u>Technical Graduates</u>		<u>Non-Exempt</u>	<u>Total</u>
		<u>Permanent</u>	<u>Rotational</u>		
Fuel Assembly Unit	17	1	--	12	30
Fuel Element					
Development Unit	13	2	2	12	29
Fuel Evaluation Unit	14	--	--	15	29
Coatings & Corrosion Unit	10	1	1	6	18
Testing Methods Unit	7	1	--	2	10
Technical Shops Unit	4	--	--	25	29
Administration	<u>1</u>	<u>--</u>	<u>--</u>	<u>4</u>	<u>5</u>
Totals	66	5	3	76	150

FUEL COMPONENT DEVELOPMENTURANIUM QUALITYHydrogen in Uranium

The uranium rods to be used in a pile test to determine the effect of hydrogen content and of anisotropies in deformation patterns upon slug rupture rates were prepared and carefully marked at Fernald. Unfortunately the heat treated rods were routed through the bar turner and the markings were largely lost. When the extent of the damage is determined, necessary changes in the production test procedure will be made.

Slug Warping

Exploratory tests, which are incomplete, have cast some light on the mechanism of slug warping during canning and irradiation. Two observations of those made to date indicate that the anneal received during lead dip canning is inadequate for relief of stresses in the slugs and that the orientation of the plane of stress during thermal cycling affects the magnitude of the warp developed.

Ingot Quality Studies

Uranium slugs from Ingot Quality Studies 7, 8, and 9A have been canned and are awaiting charging in the pile. Markedly lower slug reject rates of 1.5% and 17.7% have been observed for slugs from pickled than unpickled derby stock respectively in IQS 9A. The reactivity measurements for bare slugs in IQS 9A indicate a nine in-hour improvement for 105 piles for pickled derby slugs.

Grain Size in Dingots

Investigations of beta heat treated slugs from direct cast ingots (dingots) indicates a wide variation in grain size ranging from $\sim .100$ to $\sim .235$ millimeters in diameter. There is some evidence of an inverse relationship between the number of foreign atoms present which may be expected to occupy interstitial sites in the uranium lattice (as a consequence of their favorable Hume-Rothery size relationship) and the grain size of this relatively pure dingot uranium.

Heat Treatment

Incomplete experimental work directed towards solution of the rupture problem associated with Production Test 25-M indicates a relationship between the quench rate from the beta phase in salt bath heat treatment, preferred orientation, macro-structure, and dishing at the end of the slug. It appears that the quenching in heat treating may be of greater importance than was heretofore thought and of greater importance than whether the uranium is heat treated in slug or rod form.

The HAPO equipment for chloride salt bath transforming of slugs was checked out and put into production operation on untransformed slugs received from Fernald. About 1500 slugs were rejected as incompletely transformed by the ultrasonic equipment. Investigation has shown that some of the slugs received from Fernald were incompletely transformed; the National Lead Company is taking appropriate steps to prevent further shipment of untransformed slugs in lots containing transformed material. Another cause of rejection lies in the fact that drift occurred in the electronic circuit of the ultrasonic equipment thereby increasing the safety factor from 3 to about 10. As a result of this several hundred completely transformed slugs were rejected.

URANIUM DEVELOPMENT

Cored Slugs

Two tubes of four-inch cored slugs and two tubes of four-inch solid companion pieces were charged into C Pile on July 29 for irradiation to rupture. Material prepared for a similar charge in F Pile was canned on August 13 and should be ready for shipment to the pile in early September. A production test has been written to can sufficient eight-inch cored slugs, fabricated from alpha phase extruded hollow rod, to charge two tubes of this material in C Pile for irradiation to rupture. The metal is being machined and should be canned early in September.

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Fabrication of Uranium

Material realized from the June alpha phase extrusion at Adrian has been machined to eight-inch slugs. Preliminary tests show that the normal uranium has a generally uniform grain size of .062 - .094 mm in the heat treated condition, somewhat smaller than heat treated alpha rolled uranium. Orientation studies on two samples of heat treated material showed that the orientation was similar to that noted in rolled and heat treated uranium. The as-extruded metal exhibits no cruciform pattern as does rolled uranium. Rod surfaces were generally good and machining was accomplished with no undue difficulties. Examination of the hollow rods showed that the holes were somewhat eccentric but relatively smooth and uniform in a given rod. Tool development studies for the fabrication of hollow uranium rods is now scheduled for August 31.

The recanning of 882 recovered rejects from the July canning of powder metal compacts was accomplished. An over-all yield of 62.2 percent was realized in this canning. All the material canned under PT 313-39-MT is being prepared for shipment to the areas for charging under PT 105-39-MT. Approximately 30 tubes of powder metal compacts will be irradiated to 600 MWD/T in F Pile.

Four slugs cast into zirconium cans have been selected for use in initial end cap welding experiments. The closures will be accomplished using heliarc welding. The welded slugs will be destructively tested and the material used to obtain data on the effect of cladding on the metallographic properties of uranium.

Uranium Alloys

Preliminary tests of the alpha extruded uranium - 1.5 atomic percent silicon alloy shows it to exhibit a uniform grain size of about .049 mm. Tensile tests yielded unexpected high results especially with regard to elongation which was determined to be 18.6 percent. Examination of samples of the extruded uranium - 0.5 atomic percent titanium alloy showed it to exhibit a grain size varying from .049 mm to .094 mm edge to center. The increase in grain size was gradual rather than abrupt. Tensile tests of the as-extruded metal resulted in values much lower than those determined from initial tests of experimentally rolled and heat treated alloy. Further extensive tests are contemplated on the two alloy materials subsequent to canning and recovery. One tube of eight-inch silicon alloy slugs will be charged under a production test for irradiation to rupture.

JACKETING COMPONENTS

Uniskan

Ten zirconium sweater cans, 0.005" wall thickness, were produced from 0.022" wall thickness zirconium cans. These sweater cans will be used for hot press developments. Evaluation of uniskan as a process was in progress; specimens were prepared for mechanical and other property determinations. These results will assist in the evaluation of uniskan as a process.

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Cold Closure

A total of 55 cold closure fuel elements were produced for Applied Research and hot press canning investigations.

The first 50 extruded cups were received from Hunter-Douglas. Machining of taper on bottom of cups was started. Cold canning for the production test will begin week of August 30.

Zirconium Process Tubes

Superior Tube Company has produced successfully one 50 foot process tube of H File design from zirconium, which is enroute to HAPO and should be received by September 1.

Several tube samples of zirconium and zircaloy 2 were received in annealed and cold worked conditions; meeting was held with Pile Technology personnel and various investigations, such as mechanical property and corrosion resistance, were initiated. The results of these tests will be used to specify the heat treatment for the 30 tubes now on order.

FUEL ASSEMBLY DEVELOPMENTRadiometallurgy Examination of Irradiated Lead Dipped Slugs

The lack of uranium deformation at the slug core ends in 3-M type slugs (individually heat treated cores) was confirmed by replica measurements of three 3-M control tube slugs following removal of the jackets at the slug ends. The following significant data has been obtained to date relative to the distortion of slug core ends of lead dipped slugs:

1. The depth of the observed end concavities on four 25-M "cap" type failures (discharged at 520 - 590 MWD/T) ranged from about 40 - 75 mils.
2. The depth of the concavities on two 25-M control tube slugs (discharged at 420 MWD/T) ranged from 13 - 20 mils.
3. Only negligible deformation, 1 - 4 mils, was observed on three 3-M control tube slugs irradiated to about 590 and 690 MWD/T.

Metallographic and x-ray comparison of the irradiated rod-treated and slug-treated material has been delayed due to failure of the motor of the slug sectioning equipment.

Production of Lead Dipped Slugs with Cores Beta Treated in Slug Form

Slug rupture experience gained from production testing lead dip canned slugs made with cores machined from beta treated rod and cores beta treated in slug form has not clearly indicated that either type is much less susceptible to rupture. Accordingly, plans were made to continue the comparison of the two types of slugs on

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a production basis. The mechanized heat treating equipment required was completed and the procedures standardized. Heat treatment of production quantities of slugs machined from as-rolled rod commenced August 20. Lead dip canning of these cores, which are heat treated on site, started August 25. It is planned that this type of material will constitute about 40 percent of standard slug production. Initial canning data indicate no serious process difficulties although there are larger amounts of porosity in the Al-Si layers than have been observed for slugs containing rod-treated uranium (as was originally observed during production test canning in 1953).

Braze Layer Porosity Associated with Lead Dipped Slugs

The full significance of the braze layer porosity associated with lead dip canned slugs has not yet been determined. A series of experimental tests have started to reevaluate the effects of canning variables on the porosity produced in the braze layers of lead dipped slugs and to supplement current knowledge of the amount and distribution of hydrogen as effected throughout slug fabrication process.

During a study of the canned slug quality associated with extended use of canning baths, it was noted that the braze layers of canned outgassed (outgassing 80% complete) cores were as porous as standard non-outgassed material. DuPont also recently reported test data indicating that outgassing was ineffective in reducing braze layer porosity.

Thorium Autoclave Failures

Examination of two unbonded thorium slugs that failed in the autoclave indicates that failure was initiated by water entrapped in poor quality slug cores during preparation of the cores.

Hot Press Canning of "J" Alloy Slugs

Evaluation of the initial hot-pressed "J" alloy slugs canned using two types of component preparation (abrasion and caustic etching) has been delayed until a satisfactory bond test can be made. Canning will be resumed in the new manufacturing facilities early in September.

Fabrication of Cored Slugs

Fabrication of cored uranium slugs has been improved by the development of a direct current welding procedure. A higher yield of good welds has been obtained than with the alternating current technique and the large-grained heat effected zone adjacent to the fusion zone is about 75 percent smaller when using the direct current method.

The ends of cored slugs have been closed preparatory to dip canning by pressing aluminum or uranium plugs into tapered end sections of the "core". Tests of these slugs indicate that the aluminum-plugged core are better as they are easier to assemble, possibly more resistant to the leakage of Al-Si (filling of the core during canning), and can withstand woodsplitter cycling without loosening of the plugs. Woodsplitter tests indicate that leakage of Al-Si into the slug cavity may lead to early core failure. It, therefore, appears necessary that a

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non-destructive test be devised for detecting slugs with partially Al-Si filled cores if this type slug is canned for irradiation.

Hot Press Canning of Uranium

Continued investigation of the hot press method of fuel element assembly has demonstrated that diffusion bonded as well as unbonded and insulated pieces may be assembled employing hot press canning techniques. Solid, cored, and hollow diffusion bonded fuel elements have also been assembled with only slight modifications of equipment to produce any of the desired finished pieces.

Approximately 250 nickel-plated, hot-pressed, solid fuel elements are scheduled for pile charging during the September 3, C Pile shutdown. Reactivity tests in the 305 Pile indicate that a pile loading with this type of fuel element will give a reactivity loss of 38 inhours. A similar group of slugs with a 250 mil end cap thickness, instead of 350 mils, gave a reactivity gain of 24 in-hours.

Two hundred and fifteen nickel-plated, hot-pressed, cored fuel elements have been canned on the four-unit gang press. Approximately half this number will be charged in C Pile.

Development of the hot-press method of canning internally and externally cooled fuel elements continued during the month. The use of Molykote and wax as a pin lubricant has markedly decreased galling during pin removal. The extruded-expanded can and cap components supplied by ALCOA for the I and E slug have been satisfactory in canning experiments. Upon receipt of satisfactory hollow slugs from Fernald, approximately two hundred I and E pieces will be canned for an in-pile test. Details of the test are currently being established.

Unbonded slugs have been canned by the hot-press canning method. The bare uranium is coated with a water base graphite, dried, wrapped in aluminum foil, inserted in a can, and hot-pressed. This method of assembly precludes the possibility of weld contamination by the graphite. Additional unbonded slugs are being prepared for further evaluation.

Insulated slugs have been hot-press canned by fitting a glass-knit sock over the uranium prior to insertion in the can. Test samples are being prepared to determine the increase in uranium temperature with such a configuration.

Hot Press Canning of Thorium

Thorium wafers plated with copper, nickel, and iron have been hot-pressed canned and are currently being machined into tensile specimens. Upon the basis of this information full size thorium pieces will be canned for evaluation.

Fuel Element Pilot Plant

The Fuel Element Pilot Plant interior construction and equipment installation on Phase II is approximately 12 percent complete. Phase II is expected to be completed about December 1, 1954, and the building ready for partial use on February 1, 1955. The project proposal for the pilot plant has been revised to

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include an additional \$400,000 for semiworks equipment, and is currently awaiting approval. Specifications were prepared during the month for additional pilot plant equipment such as die pre-heat furnace, annealing furnace, quench tanks, blanking presses, etc. Negotiations for the purchase of the electroplating equipment are continuing and at month's end bidding was reopened.

FUEL EVALUATION

Fuel Examination

A temporary bulkhead was installed adjacent to the main underwater door of the Metal Examination Facility - 105-C which permitted draining the facility and proceeding with decontamination and installation of a new door seal. The walls and floors of the various basins have been cleaned and Amer-coating will begin the first of September. The completion of this work will permit the installation of equipment on hand as scheduled and operations should begin in this new facility during the month of October.

"Woodsplitter" Improvement Program

A new induction heating work station designed to reduce job hazards as well as improve both the time and the heating efficiency has been installed. Shake-down testing by plant electrical forces is in progress. With the expected increased heating efficiency, it may be possible to cycle an eight-inch slug into the beta-phase transformation temperature (660 C).

The "multiple" work station facility has been approved by General Electric and is now before the A.E.C. The Project Section will proceed as soon as the Commission authorizes expenditures.

"Woodsplitter" Modifications - High Temperature System

Flow diagram drawings for the "woodsplitter" high temperature recirculating loop have been made and detailed design should be started by October 1, 1954, by the Mechanical Design Unit. Tentative scoping calls for water flows of 10 - 60 gpm at temperatures up to 200 C. Operating pressure would be about 300 psi at maximum operating temperature. Since Dowtherm has a vapor pressure of only 4.1 psia at 200 C, feasibility of using it instead of water as a coolant is being investigated. The flow rate of Dowtherm would be about 2 1/2 times that of water for the same Δt in the coolant.

Fuel-Element Evaluation

A study of the fabrication history, irradiation experience, and potentiality of the lead-dip canned HAPO fuel elements is in progress and a report will be issued in the near future. The slugs used in Production Tests 3-M and 7-M are of equal or possibly better quality than the standard triple-dip canned piece. The 25-M in-pile experience appears anomalous, compared to preceding experience with 7-M, and considering the unusual predominance of cap-type failures.

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A study of the "J" slug failure problem has been initiated. Most of the 15 unbonded "J" slugs which failed during June, July, and August were the "J-3" type. These failed in a narrow burnout range, from about 5 to 8 percent. The others, "J-2" type, failed at 13 to 16 percent burnout.

Fuel Survey

Thirteen four-inch canned slugs, containing compacted, graded UO_2 powder at a density of 73 percent of the theoretical value, have been received from the Oak Ridge National Laboratory. Measurements are in progress to determine the reactivity, conversion ratio, and resonance escape probability of the pieces.

TESTING METHODS

Eddy Current Instruments

The production prototype MIZ-1 and MIZ-2 instruments, Al-Si penetration and crack and inclusion detector respectively, are both being aligned and checked out in the laboratory, and should be in operation within a few weeks.

Fernald Transformation Test Equipment

The ultrasonic transformation testing equipment being built for Fernald consisting of a Sonotest unit and an automatic conveyor was completed, tested, and shipped.

Ultrasonic Bond Test

The "Sonobond", ultrasonic bond, testing equipment was moved to the 313 Building for final checking before being placed on the production line.

Sonic Vibration Test for Orientation

Results of sonic vibration tests applied to uranium having different orientation and rolling histories indicate that such tests may be used to determine the amount of preferred orientation.

Measurements of internal friction of a slug cycled in the "woodsplitter" indicate that internal stress may also be measured by the sonic vibration method.

COATINGS AND CORROSION

Corrosion Studies

A flow laboratory test has shown that there is a marked increase in corrosion rate of an aluminum can when it is heated internally. Some pitting also occurred on the exterior surface of the heated can.

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Aluminum samples which had been placed in the autoclave with deionized water at 300 C for 14 hours corroded excessively. With the exception of two alloys, 54-S and XK-183, the samples had disintegrated. A marked rise in pH indicates that static testing of these alloys at high temperatures will be of little value. At 275 C in buffered systems the corrosion rates were still excessive.

Anodized Films

The first discharge of the fuel elements having protective sealed anodized films occurred after an exposure of three weeks at an average outlet water temperature of 83 C. In contrast to all previously anodized pieces exposed at high water temperatures, the film was still present on all pieces anodized in oxalic acid while the film had disappeared from those sulfuric acid anodized per located in the rear third of the pile.

Electroplating Studies

A procedure for plating the counterbore of cored pieces was developed. With this procedure cored pieces can be plated almost as rapidly as solid pieces.

Further studies have shown that a current density of 45 amperes per square foot gives a more satisfactory plate. Since this also increases production, all future slugs will be plated at this higher current density.

Thorium pieces have been plated experimentally with nickel, iron, and copper. These will be tested for corrosion and bond strength. Dual plates on uranium have satisfactorily passed all preliminary tests and appear to be a promising alternative to nickel if it is desired to reduce the reactivity loss. Further studies to determine minimum plate thicknesses are continuing.

Diffusion Barriers for Unbonded Slugs

Many different procedures for applying a diffusion barrier onto uranium were tried. The simplest and most adaptable appeared to be a dip or spray of a graphite suspension. Some graphite coated slugs were cold canned. In most cases, the procedure was satisfactory. The graphite coat is inexpensive, adherent, and easily applied.

Insulated Fuel Elements

Some insulated fuel elements were prepared by anodizing the interior of a can, heating to expand the can, and inserting the uranium slug into the heated can. The can shrinks and cools to a tight fit. By utilizing a special technique, the height of the anodized film was controlled within very narrow tolerances. No trouble was experienced in welding these pieces.

Wafer Slugs

Some wafer-type fuel elements were produced by the vacuum canning technique. Pressure of impurities resulted in unsatisfactory bonds. Further tests are continuing.

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INVENTIONS

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

GE McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough: bz

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MONTHLY REPORT
DESIGN SECTION**DECLASSIFIED**VISITORS AND BUSINESS TRIPS

R. W. Cordell, Panellit, Inc., Chicago, Ill., visited Hanford August 1st through the 26th to test and calibrate Temperature Monitor System, 105-KW.

M. F. Parr, Foxboro Co., Foxboro, Mass., visited here August 17th through the 27th to calibrate power calculator in 105-KW.

C. S. Slemming and H. M. Schmitt, Minneapolis-Honeywell Regulator Co., Philadelphia, Pa., visited here August 31st to check trouble encountered on Thermal Shield Temperature Scanner, 105-KW.

O. W. Priebe visited Allis-Chalmers Co., West Allis, Wisc.; The Babcock & Wilcox Co., Alliance, Ohio; Combustion Engineering Co., New York City, N.Y.; Ingersoll-Rand Co., Philipsburg, N.J.; Worthington Pump Co., Harrison, N. J.; Westinghouse Electric Corp., Cheswick, Pa.; DeLaval Co., Trenton, N.J., from August 9 through 19th to obtain operating characteristics and design data for high pressure and temperature pumps.

W. L. Pearl visited ORNL, Oak Ridge, Tenn.; SRP, Aiken, S.C.; KAPL, Schenectady, N.Y.; ANL, Lemont, Ill., and The Babcock & Wilcox Co., Alliance, Ohio, from August 11th through 28th to discuss new separations design.

N. T. Hildreth visited Service Metal Fabricators Co., Los Angeles, Cal., August 23rd to 25th to review the in-line alpha monitor fabrication work.

ORGANIZATION AND PERSONNELPersonnel Statistics:

	<u>July 31</u>			<u>August 31</u>		
	<u>Exempt</u>	<u>Non Exempt</u>	<u>Total</u>	<u>Exempt</u>	<u>Non Exempt</u>	<u>Total</u>
Design Management	1	1	2	1	1	2
Process Engineering Sub-Section	63	12	75	67	13	80
Design Planning Unit	18	12	30	17	12	29
Design Engineering Sub-Section	83	11	94	82	10	92
Design Drafting Unit	<u>8</u>	<u>89</u>	<u>97</u>	<u>8</u>	<u>87</u>	<u>95</u>
Total Section Personnel	173	125	298	175	123	298
Technical Graduates (Rotational)	<u>-</u>	<u>10</u>	<u>10</u>	<u>-</u>	<u>8</u>	<u>8</u>
TOTAL	173	135	308	175	131	306
Accessions	- 11					
Separations	- 13					

GENERAL

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

	<u>Engineering Man Months Expended</u>	<u>Drafting Man Months Expended</u>	<u>Overall % of Total</u>
1952 Expansion Program	34.7	11.8	18.5
Reactor Plant Modification for Increased Production	28.7	23.7	20.3
4-X Program	4.1	0.1	1.7
Design Development	63.1	21.7	33.7
Other	<u>33.2</u>	<u>33.7</u>	<u>25.8</u>
	163.8*	91.0*	100.0

*Equivalent man months expended includes 1.9 months of engineering and 0.3 months of drafting overtime. Three percent of the Section worked a six-day week. This represents a minimum level for Section operation.

The drafting production for the month was 305 new drawings, 22 charts and graphs, and 238 revisions. The drafting room average was 4.1 man days per drawing.

DESIGN DEVELOPMENTStatistics:

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

	<u>Engineering</u>		<u>Drafting</u>	
	<u>Man Mo.</u>	<u>% of Total</u>	<u>Man Mo.</u>	<u>% of Total</u>
Metallurgical Design Development	6.6	10.5	3.5	16.1
Reactor Plant Design Development	26.9	42.6	8.2	37.8
Separations Plant Design Development	25.8	40.9	7.2	33.2
Chemical Processing & Reduction Design Development	2.9	4.6	0.7	3.2
234-5 Design Development	<u>0.9</u>	<u>1.4</u>	<u>2.1</u>	<u>9.7</u>
	63.1	100.0	21.7	100.0

A recast of the Design Section Revised Budget for FY 1955 and Budget for FY 1956 was completed based on a Design development expenditure of \$1,046,000 for FY 1955 and \$1,048,000 for FY 1956.

Metallurgical Design Development

A report was issued on the prototype fuel element canning machine summarizing the status of development and test work and including a review of problems remaining to be solved

and estimates of the time and cost to complete development. Also included in the report are the results of a revised analysis of the economic incentive for mechanization based on current information on the cost of manual operation. These results, together with estimates of the time required for application of mechanization to production and of the timing of anticipated process changes, will aid in making a decision determining the future course which the program should take.

Reactor Plant Design Development

Reactor plant design development effort was concentrated on the preparation of prescope information of an intermediate power level reactor and supporting facility design for a closed recirculation system for reactor cooling. The 1600 MW dual purpose reactor will be expected to produce 400,000 KW of electric power and is made up of a process block with small lattice and using hollow fuel elements. A reasonable and workable arrangement was prepared to coordinate a power plant and water plant structure with that of the reactor itself. Sizing of component parts for the water supply system, intensive development of the reactor process block and rearrangement of the reactor building was carried on during the month.

An analysis of unit handling times, manpower requirements and costs associated with manual handling of material in the reactor storage basins was made. The data will be used in a study of mechanized handling equipment as a means of picking up and separating the various process and dummy materials.

A draft of a proposed scope basis for a disaster control system for Hanford reactors was completed. Two alternate sources of reactor emergency cooling water are included in the report. One source consists of existing 100 Area surface water storage facilities and the other source consists of a shallow well supplied by Columbia River water via a rock filled tunnel.

Separations Plant Design Development

An evaluation of the proposed TRX Plant was started during the month. Briefly, it consists of dissolving slugs in the T Plant, transferring dissolver solution to the 221-U Building where it would be processed through two co-decontamination cycles, and then transferred to a separate new building for a partition cycle, a uranium cycle, and a plutonium cycle. The proposal is being studied from the standpoint of feasibility, cost, and timing. Additional dissolving capacity of sufficient size to provide feed for the TRX Plant and to allow shutting down of the Redox dissolving facilities would be provided in a new dissolver building. This would permit the Redox crane to be used full time for maintenance work and increase plant efficiency. Flow diagrams, building arrangement drawings, typical building cross sections, and plot plans are being prepared.

A document containing the scope and recommending the installation of organic stripping before intercycle concentration in the TBP series process was completed, issued, and approved as part of the scope of CG-562. A second document, scoping the other modifications to the TBP Plant required by series operation is in the final draft stage. It also contains the results of a capacity study made of the plant and equipment as it will operate under series operation. It is concluded that the TBP Plant will be capable of operating at a peak instantaneous rate of 10 tons of uranium per day in series operation in accordance with TBP Flowsheet HW-6.

The scope design of two alternatives for Redox nitric acid recovery was completed, and six drawings were issued for comment. A draft of a scope document showed that a "pay-out" period of about three years favored the "dual purpose" nitric acid-ammonia absorber in place of the down draft condenser plus the ammonia scrubber.

A study was initiated toward the preparation of a proposal for the scavenging of the 221-T Plant first cycle wastes. Tests indicate that wastes may be reduced in volume to about 25-30% of their original volume. This high percentage of sludge is due to the presence of aluminum from the coating wastes which are combined with the first cycle wastes for disposal. Additional study of the economics of scavenging versus waste evaporation which results in about the same amount of concentration is being made.

The development of a prototype in-line alpha monitor was continued during the month. Minor modifications were made in the fabrication of the prototype and the delivery date was extended to September 9, 1954. An improved tape dimpling device is being fabricated on-site for replacement in the prototype.

Other separations plant design development work includes: preparation of scope drawings for two alternatives for increasing the ventilation in the Redox Plant; scoping of a larger Redox oxidizer vessel; scheduling cold operational testing on new "mocked up" equipment; installation of the experimental Somastic coated waste line from the Hot Semiworks to 241-C; testing of percolation at cribs.

Chemical Processing and Reduction Design Development

Development testing of a new 234-5 Building Task III furnace valve was completed and satisfactory performance of all features were attained. Fabrication and successful testing of the mechanical manipulator were completed. In addition, Task III pressure vessel and induction heating coils were successfully tested.

Engineering Standards and Materials Development

Cost to date for development of engineering standards for the current fiscal year is \$16,088. This work is supported by the five design development programs.

The following standards and design guide were completed and issued during the month:

- D-3-4 Fire Alarm Grounding Assembly to Water Pipe or Ground Mat
- D-3-4a Fire Alarm Grounding Assembly with Ground Rods
- DG-200-E Electrical Pole Line Hardware and Materials (Formerly reported as HWS-5750-S)

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Design Section

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

- a. Work on new standards for instrument symbols was advanced 5% during the month to 65% complete.
- b. A new standard specification HW-5310-S, "Standard Specification for Identifying Metals in Stock" is 85% complete, an advance of 25% during the month.
- c. A new mechanical standard for "Cylinder Gas Piping Systems" was advanced to 85% complete, an increase of 15% during the month.
- d. Revisions to design guides on Process and Service Piping and on Valves and Valve Equivalent were each advanced 5% during the month to 30% complete.
- e. Work on HWS-5766-S "Standard Specification for Radiographic Spot Examination of Welded Joints" is 75% complete, an advance of 10% during the month.
- f. The experimental installation for the Cathodic protection test in 100-B Area, West Retention Basin, was completed during the month and first measurements were made during the latter part of the month with cold water in the basin.
- g. Two new steam heated water tanks for evaluation of protective coatings are near completion in the 105-H Building. Test samples will be immersed as soon as possible.
- h. An aluminum box design for transportation of bare uranium fuel elements was developed to determine the economic possibility of replacing wood boxes to reduce the storage fire hazard.

DESIGN PROJECTS

Statistics:

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

	<u>Engineering</u>		<u>Drafting</u>	
	<u>Man Mo.</u>	<u>% of Total</u>	<u>Man Mo.</u>	<u>% of Total</u>
1952 Expansion Program	34.7	34.4	11.8	17.0
4-X Program	4.1	4.1	0.1	0.1
Reactor Plant Modification for Increased Production	28.7	28.5	23.7	34.2
Other	<u>33.2</u>	<u>33.0</u>	<u>33.7</u>	<u>48.7</u>
	100.7*	100.0	69.3*	100.0

* Equivalent man months expended reflects 1.3 man months engineering and 0.3 man months drafting overtime.

Design Section

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CA-512 - 100-K Area Facilities

Design activities on 100-K Reactor Facilities consisted mainly of the following items in support of construction: bid review, drawing revisions, review of vendor drawings, the preparation of construction as-builts, and design liaison with the field.

Design of the 1706-KE Recirculation Facilities was advanced 8% during the month to 28% complete. Twenty-three drawings are in the checking stage and twenty-one have been issued for comment. The availability of an acceptable high pressure recirculating pump remains the greatest problem. Canned rotor pumps may be the solution to the problem. Studies of two-phase-flow conditions continue; however, no formal conclusions have been reached. It is apparent that a limited number of two-phase-flow studies can be made with presently designed piping and the addition of a condenser sub-cooler located in 105-KE.

CA-513 - Purex Separations Facility

Design of revisions to the condenser design for the Purex Tank Farm was continued during the month. The revision of existing contract drawings to eliminate the surface condenser from the contract, the material requisitioning for the contact condenser installation, and the preparation of new construction drawings for the lump sum contract are 100% complete. Design of a new proportional sampler which is not a part of the lump sum contract, is the only remaining item. The overall design is 97% complete.

Design of an extension to the Purex railroad tunnel was reviewed and work is underway to see if a railroad switch could be installed to permit a branch tunnel to be installed at a later date and thus allow the proposed tunnel to be shortened.

Additional tests were performed on three inch stainless steel pipe purchased from the Savannah River Project for use in the Purex hot pipe trench. Of 1900 feet of pipe tested, 860 feet were determined to be acceptable.

CA-514 - 300 Area Expansion

Design of the 300 Area Expansion Program was advanced 1% during the month to 94% complete. Design of the 313 Building structure and equipment is complete. Detail design of the ultrasonic bond testing equipment to replace the frost test equipment is approximately 15% complete. Design proceeded with the conversion of the 3706 Building to first aid and office occupancy and detail design is 55% complete, an increase of 35% during the month.

A decision was made that the existing water supply system for the 300 Area is adequate and that no changes need be made as part of this project.

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CA-535 - Redox Capacity Increase, Phase II

Final design of Redox Capacity Increase, Phase II, is 99% complete, an increase of 1% during the month. Four drawings were completed during the month. The scope of the job was increased by approximately six drawings of which about three remain to be completed.

CG-558 - Reactor Plant Modification for Increased Production

Overall design on Reactor Plant Modification for Increased Production is 30.8% complete, an increase of 4.3% during the month. Detail and scope design were advanced 4.8% and 8.7%, respectively, during the month to 24.8% and 83.7% complete. Twelve specifications and 238 drawings have been issued for comment while 7 specifications and 104 drawings have been issued for approval.

Structural design of the 181-B and C Buildings was issued for approval during the month while additional ventilation work for cooling was added to the previously completed mechanical design. Structural changes for the floor system of the 181-D Building were issued for comment while all other design has been issued for comment or approval. Instrument and electrical drawings of the 183-B Building have been issued for comment while structural modification design is complete. Other design work was started on the 183-D, F and H Buildings.

Architectural and structural drawings, with the exception of those depending on vendor information, were approved for the 190-B Building while approximately 90% of the mechanical drawings have been issued for approval. Structural and mechanical design on the pumps and drives is approximately 75% for the 190-DR Building. Mechanical Design is approximately 80% for the 190-D Building.

Mechanical design is about 80% complete for the 105-B Building; 30% for 105-D, and 50% for 105-DR. Work was started on structural changes in the 105-B and D Buildings for the replacement downcomers.

Specifications and drawings were prepared for modifications of 151-D switchgear while preliminary architectural and civil design was started on the addition to this building. Design of the raw water lines of the "B" Area is approved and design is proceeding on the "D" Area. The "B" Area effluent system drawings are circulating for approval while the last of the drawings for the "D" and "DR" effluent systems were issued for comment this month. Structural modifications to the expansion boxes of the "H" effluent system were also issued for comment during the month.

The A.E.C. approved authorization of poison column charge-discharge equipment at 105-

Design Section

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CG-562 - Waste Metal Recovery Plant Modifications

Design is underway and is approximately 50% complete on the Waste Metal Recovery Plant Modifications to permit series operation. Ten drawings were approved and one drawing was issued for comment during the month.

CG-574 - Hanford 3-X Program - Irradiation

Design for this project is 80% complete. Design work on the J-slug shipping casks is continuing and is scheduled for completion in September. Present scope includes no provision for design or procurement of Q and N material shipping casks as these are available in adequate numbers from other A.E.C. installations.

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

Design of the Effluent Water Monitoring Improvements 100-B, D, DR, F and H Areas was advanced 12% during the month to 31% complete. Eleven drawings are approved, seven drawings are issued for comment and nine drawings are in the check print stage. There has been considerable difficulty to date in selecting a vendor for the spectrometers. No orders have been placed because of inability of bidders to meet necessary design specifications.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design of oxidizer off-gas treatment equipment is 100% complete, an advance of 10% during the month. Seven drawings were approved during the month to make a total of twenty-seven drawings produced.

CG-587 - TBP Waste Scavenging

Design of the TBP Waste Scavenging facilities is 100% complete, an increase of 15% during the month. Six drawings were approved during the month to make a total of fifteen drawings produced.

CG-588 - Ammonia Scrubbers, Redox

Design for the Redox Ammonia Scrubbers was advanced 25% during the month to 75% complete. Fifteen drawings were completed during the month to make a total of sixteen drawings completed out of the twenty-four required drawings.

CG-597 - Hanford 4-X Program - 200 and 300 Areas

A scope document covering the proposed installation of a third extraction cycle in the "T" Plant to increase production by at least 18% was prepared and issued during the month. A scope document for the reactivation of the "B" Plant is underway and completion of this work is anticipated by the end of September. Advance ordering was started of critical materials such as stainless steel pipe, remote connectors, jets, and crane periscope parts. Work was started on a preliminary design, procurement, and construction schedule for the "B" and "T" portions of the project.

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CG-599 - Hanford 4-X Program, 100 Areas

Initial efforts for the Hanford 4-X Program, 100 Areas are being directed toward determination of cask car and bucket requirements.

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

A directive was issued by the A.E.C. near the end of the month authorizing \$39,000 for installation of a third extraction cycle in the 221-T Plant.

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

Design of the modification of the 189-D Process Tube Mock-Up is approximately 60% complete, an advance of 10% during the month. The foundation design drawing was completed for the motor-generator and switch gear equipment. The problem of source and adequate supply for condenser cooling was resolved and a design drawing was prepared and issued. The design scope was increased to include design of process tube connector heads.

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

Design of equipment exhaust hoods for the fuel element pilot plant was advanced 15% during the month to 100% complete. Six drawings were prepared for this assignment.

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

Drafting is continuing on the revision of Hanford project maps to bring them up to date and is approximately 40% complete, an increase of 5% during the month. Of 125 electrical drawings, 49 have been started and 150 of 275 civil drawings have been started.

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

Design of the Redox Silica Gel Tail-End Treatment Facility was advanced 25% during the month to 75% complete. Of 46 required drawings, 26 drawings are out for comment and 3 drawings were approved during the month to make a total of 6 approved drawings.

D.O. 100851 - Project Proposal - Metal Loading Facility 100-B,D,F, DR and H Areas

Justification based on metal loader action in the 105-C Building was completed during the month. Pre-dated approvals are being obtained from the Project Section prior to submission to the Manufacturing Department.

D.O. 100884 - Installation of Third Charging Machine, 100-B,D,F,DR and H Areas

The work concerning the installation of third charging machine was converted from a project proposal to a request of appropriations with the concurrence of the Financial and Manufacturing Departments. The request was submitted to the Manufacturing Department.

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

A scope design and project proposal rough draft was completed for construction of approximately 6,000 square feet of additional space to the existing 712 Building (Records Service Center) to provide the required space, which will parallel the type of building construction now occupied.

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

Detail design of the renovation and addition to Building 3730 as a hot shop for experimental work on graphite is approximately 25% complete.

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

Detail design on a gas moisture detection system for the 100 Areas was advanced to 20% complete. Six drawings were issued for comment.

D.O. 100963 - Floor Loading Stress Survey, 325 Building

Checking the floor structure for proposed loadings in various rooms of the 325 Building is 15% complete, an advance of 5% during the month.

D.O. 101003 - Storage Basin Cleaners

Design was started and a preliminary report discussing several methods of disposing of sludge which has accumulated in the 105-B, C, D, F and DR storage basins was prepared and issued for comment.

D.O. 101015 - Dejacketing and Ultrasonic Equipment, 105-C Building (CG-589)

Preliminary engineering flow diagrams were prepared for a can stripper. Design work will progress at a more rapid rate upon receipt of approved criteria. A total of 22 drawings will be required and a tentative drawing schedule was issued.

D.O. 101018 - Review of Instrument Design (CG-496)

Instrument design drawings for Recuplex were reviewed and 25 drawings were revised to show late design changes.

D.O. 101023 - Fuel Element Pilot Plant (CG-546)

Work was started on development and preparation of a scope drawing for project proposal revision purposes.

D.O. 101035 - Installation of Car Pullers, 100-B,D,F and H Areas

Work was started on installation of car pullers for a lump sum contract.

D.O. 101039 - H-4 Oxidizer Redesign

Detail design was started on design of a new H-4 vessel for the Redox Plant so that its capacity will be in balance with other vessels in the metal solution preparation system. The work is being based on unapproved and preliminary scope information. Two drawings will be required.

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D.O. 101045 - Detail Design - TV Installation 105-B (CG-593)

Design was started on detail design, specifications, purchase requisitions, as-built drawings, acceptance test procedures and review of bids for the 105-B closed circuit discharge area television viewer.

DESIGN SECTION WORK COMPLETED OR IN THE CLOSING STAGES DURING AUGUST

- * D.O. 100679 - Fiscal Year 1954 Water Tank Replacement
- * D.O. 100688 - Solvent Storage Facilities
- * D.O. 100730 - Reinforcing for Redox Tanks
- * D.O. 100846 - General Improvements to Laboratory Area Buildings (CG-576)
- D.O. 100852 - Cement Pad for Grain Storage Bin, 100-F
- * D.O. 100873 - Horticultural Containers and Equipment
- D.O. 100887 - Redox Production Facilities (CA-187-D-III)
- * D.O. 100893 - Redox Viewing Room
- * D.O. 100909 - Thermo-Well Drawings - 200-W
- * D.O. 100921 - Sludge Pot 100-F Area
- * D.O. 100923 - Call Jumpers - 221-T Building
- * D.O. 100962 - Monorail Loading Stress
- * D.O. 101009 - Jumper, 153-T Diversion Box
- * D.O. 101047 - Jet Jumper D-7 to D-8, 202-S Building

* Design Section work completed during the month

INVENTIONS

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

R.H. Beaton
Manager, Design
ENGINEERING DEPARTMENT

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Design Section

Description Exp. Program*	Backlog Start of Mo.	Work Sched dur.	Time Spent dur.	% of Total Effort	Backlog End of Month	SCHEDULED FY 1955												Bal FY 55	Total
						ENGINEERING MAN MONTHS													
						PROCESS ENGINEERING SUB-SECTION													
DESIGN ENGINEERING SUB-SECTION																			
						Sept.	Oct.	Nov.	Dec.	Jan.	Feb.								
CG-558	27.9		4.0	6.1	23.9	4	4	4	4	3	3	3	3	3	3	1.9	23.9		
Reactor R & D	202.0		20.5	31.4	181.5	20	20	19	18	18	18	18	18	18	18	68.5	181.5		
Sep. R & D	229.5		19.3	29.5	210.2	19.5	19.5	19.5	19.5	20.5	20.5	20.5	20.5	20.5	20.5	91.2	210.2		
Met. R & D	50.0		4.4	6.7	45.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	18.6	45.6		
23A-5 R & D	17.0		1.4	2.2	15.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	6.6	15.6		
Weapons R & D	9.5		0.2	0.3	9.3	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	6.3	9.3		
Other Projects & Design Orders (Incl. 4-X)	63.9	75.0	2.1	3.2	136.8	2	2	4	6	7	8	8	8	8	7	107.8	136.8		
Anticipated Fut. Work	703	75.0	65.5	100	712.5	65	65	65	65	65	65	65	65	65	65	332.5	722.5		
TOTALS																			
* Includes 1706 ME																			
DESIGN ENGINEERING SUB-SECTION																			
1952 Exp. Program	136.3		24.7	30.5	111.6	20	17	15	12	8	6	33.6	111.6						
CG-558	225		22.0	26.9	203	23	23	23	23	23	23	23	23	23	23	65	203		
CG-578 & 579	19.1		1.5	1.9	17.6	2	3	3	2	1	1	5.6	17.6						
R & D Programs	123.5		12.0	14.8	111.5	12	12	12	12	11	11	41.5	111.5						
Other Major Projects (Incl. 4-X)	160.1	63	15.6	19.1	207.5	17	18	18	20	24	24	86.5	207.5						
Minor Projs. & Des. Orders	55.8	2.2	5.5	6.8	52.5	5	4	4	4	4	4	27.5	52.5						
Anticipated Fut. Work	719.8	65.2	81.3	100.0	703.7	80	80	80	80	80	80	382.7	862.7						
Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:																			
Authorized Projects																			
Arch. & CIVIL	135											25	160						
Mechanical	210											29	239						
Electrical	138											70	208						
Instrument	160											25	185						
Standards	60											10	70						
TOTALS	703											159	862						
Anticipated Future																			
FY 55																			
Totals																			

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MONTHLY NARRATIVE REPORT - AUGUST, 1954

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Effective August 14, 1954, H. H. Hubble was assigned as Unit Head, 100-300 Areas Project Engineering, to replace H. P. Shaw who was transferred to Design Section. Following is a summary of personnel changes in Project Section during the month:

	<u>July 31, 1954</u>	<u>August 31, 1954</u>	<u>Net Change</u>
Employees on Payroll	424	416	-8
Tech. Grad.-Rotational	9	8	-1

The end-of-month status involved these changes:

	<u>Project Section Personnel</u>	<u>Tech.Grad.-Rotational</u>
Payroll Additions	2	1
Payroll Removals	7	
Transfers into Section	8	
Transfers from Section	11	2
Transfers within Section	11	

B. SCOPE OF ACTIVITIES

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

<u>Project No.</u>	<u>Title</u>	<u>Completion</u>	
		<u>Scheduled</u>	<u>Actual</u>
CG-496	Recuplex	74%	66%
CA-512	100-K Area Facilities		
	KW - Water Plant	100	98
	Reactor & Bldg.	100	98.4
	KE - Water Plant	99	88
	Reactor & Bldg.	86	81.4
	General Facilities	96	95
CA-513	Purex Facilities, Part "A"	75	63
	Part "D"	80	85
CA-514	300 Area Expansion	54	58
CG-535	Redox Capacity Increase, Phase II	74	73
CA-539	Redox 241-SX Tank Farm	99.9	99.9
CA-546	Fuel Element Pilot Plant	46	22

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C. CRAFT LABOR

The 900 pipefitters who were discharged on July 29, 1954, for failure to perform assigned work returned to the Purex construction site on August 2. Work was delayed intermittently by walkouts or stoppages involving carpenters, laborers, ironworkers, boilermakers, and operating engineers. The longest strike was by carpenters who walked off the Purex site on August 13. This strike continued until August 26 when a picket line was established at the North Richland bus lot and resulted in the absence of 3700 workers. Pickets were withdrawn on August 27, and a normal work force returned on Monday, August 30, 1954.

D. SAFETY AND SECURITY

There were ten regular meetings for discussion of safety, security, and health topics which were attended by about 305 G.E. personnel. Three sessions of the Supervisor's Accident Prevention Program were attended by 43 supervisors. Five regular Monday morning tool box meetings were conducted in the field for service contractor personnel. Special Hazards Disclosure and Orientation was given to 56 service contractor employees before assignment to S.W.P. work.

E. HIGHLIGHTS

Minor Projects Sub-Section

Work was done on 40 project items, three informal requests, and miscellaneous work orders representing total authorized funds of \$40,410,619. The Sub-Section completed assigned work on CG-569, Replacement of Catch Tanks - 311-ER and 302-ER; IR-162, Fire Protection - 272-W; and ER A-1212, Diversion Outlet from Retention Basins, 100-D and F Areas. Six project proposals were approved by General Electric Company. Three authorizations were granted by the AEC. The Sub-Section accepted initial assignment of work on two projects and four engineering requests. Warehouse service for Minor Construction Miscellaneous Stores was begun on August 16 in Warehouse #1, 2, and 5 at White Bluffs. Important projects now in progress include Recuplex Installation - 234-5 Building, Activate Task I RMA Line, Expansion of 300 Area Production Facilities, Fuel Element Pilot Plant, Hot Semiworks Conversion, Hanford 3X Program, Reactor Plant Modification, and Hanford 4X Program.

Project Auxiliaries Sub-Section

Inspection was completed on 105 orders; 98 new orders which will require inspection were received. At the end of the month there were 1005 current orders for items which require inspection. The Corrosion Testing Program included evaluation of 356 coupons, a decrease of 15%. Reproduction output was 336,179 square feet, a decrease of 16%. Estimating completed 26 estimates, of which 11 were for project proposals. Field Surveys continued to obtain dimension data for the modification of 100 Areas, and to provide other routine survey and scoping services.

Reactor Projects Sub-Section

Activities at 2101-M Building were focussed on tools and jigs for the Physical Constants Test Reactor. Tooling was about 75% complete, and a few machine

trials have been run. At 100-K Area, all river pumps at 181-KW are operable from the 165-KW Control Room. The No. 2 boiler at 165-KW was operated on automatic control, and switchgear has been given preliminary tests. The 151-KW Substation is on permanent power. One transformer is on the line, and the other is ready for energizing. The 190-KW Building was ready for the dynamic flow test, assuming the use of the temporary bowls for secondary pumps. Preliminary tests of 183-KW Filter Plant have been conducted, including chemical and silicate systems. At 105-KW Reactor, acceptance testing was 18% complete. All horizontal control rods have been run under power, and installation was being completed for vertical safety rods and Ball 3X assemblies. Connectors on the outlet face have been completed, and 2500 front face connectors have been installed. For 105-KE Reactor, installations include top skin, Ball 3X hoppers, vertical safety rods, and step plugs. Horizontal rods were about 65% complete. Five rows of pigtailed have been set to assist final alignment of crossheaders.

Separations Projects Sub-Section

The major design effort on Purex was concerned with design changes. An order was placed for two color-TV sets for Purex Canyon. Construction of 202-A Building consisted of painting, installation of roofing, and piping. Flushing of lines in the Hot Pipe Trench was started August 23. Electrical tests are being conducted on elevators and the remote crane. The central control room graphic panels are all set, and 50 transmitter racks have been set in place. The first canyon vessel, Filter F-A1, was installed in the process cell on August 23. Fifteen other vessels were delivered to the building. All of the required six tanks for 203-A have been erected. At 211-A Chemical Tank Farm, Tanks 11, 12, 40 and 41 were completed except for plug valves; and Tanks 20 and 21 were essentially completed. The subcontract for the 2901 Export Water Line was completed August 25, 1954. At 284-E Power Plant Addition, the coal conveyor was essentially completed. Boilers are being dried out, and auxiliary equipment has been operated with light loads. At 241-A Tank Farm, placement of concrete for tank walls was completed, and forms for tank domes are being placed. Three tank liners have been painted.

F. MONTHLY REPORT OF INVENTIONS AND DISCOVERIES

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

E. A. Oetzel Torque Steering Device for Outboard Motorboat Motors

Date: August 18, 1954

August 31, 1954

J. S. McMahon
 J. S. McMahon, Manager - Projects

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II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

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

Revision No. 1 to Project CG-597, Hanford 4X Program - 200 and 300 Areas, was authorized by AEC on August 24, 1954, as Project CG-603. Work orders have been issued to Plant Forces for the initial phases of this project.

CG-605 - Installation of Additional Generating Capacity - 189-D

The project proposal was transmitted to AEC on August 26, 1954.

ER A-764 - Fire Station Addition

The Section has been requested to prepare a project proposal for an addition to the fire station in 200-W Area.

ER A-765 - Painting Water Plant Structures - 100-DR Area

The Section has been requested to make a study of paint to be used and prepare a project proposal to paint the 100-DR Buildings.

ER A-1214 - Scope Work to Install Steam Vent in 189-D Building

Preliminary design was completed during the latter part of August, 1954. An estimate of the installation cost is being prepared.

ER A-1215 - Study - Heating No. 1 and No. 2 Warehouses - White Bluffs

Scoping was 20% complete. In the study report, it was recommended that oil fired heaters be used for storage areas and electric unit heaters be used for office areas. The high spot estimated cost was \$15,500. Alternate heating methods, on electric unit heaters and steam heating, were reviewed.

2. Final Reporting

CG-569 - Replacement of Catch Tanks 311-ER and 302-ER - 200-E and W

The project has been completed and accepted. Information for the Physical Completion Notice is being assembled.

IR-162 - Fire Protection Buildings, 272-E and W

Construction progressed 2% to completion, except for tie-ins to the fire alarm system which are covered by a work order from AEC to G.E. Information for the Physical Completion Notice is being assembled.

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ER A-1212 - Diversion Outlet from Retention Basins, D and F Areas

All further work has been cancelled.

3. Current Projects

CG-496 - Recuplex Installation - 234-5 Building

Design had been completed previously; construction progressed 10% to a total of 66%. Installation of process piping progressed favorably with the exception of about 30 process valves which had not been delivered. The order for Chempumps

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Work on 100-KE Water Plant consisted of "bumping" for rotation the river pumps No. 1 to 5, installation and testing in 165-KE Building, and minor progress in 190-KE Building.

In Building 1706-K, the four mock-up tube feed pumps and the raw water pump were set and grouted. Piping for the 1706 Tunnel has been started and some ventilating equipment has been set in place.

105-KW and 105-KE Reactor Facilities

Construction progress on the 100-K Reactors was as follows: KW progressed 5.1% to a total of 98.4%; KE progressed 4.4% to a total of 81.4%. Concrete work consisted of numerous small placements in 105-KW and related buildings. The structural work completed was placement of railroad slabs west of the transfer area, concrete pipe supports in the effluent tunnel and patching of the storage basin. At the end of 48 hours, leakage rate of the storage basin was well within requirements of the acceptance test. Although much preliminary testing has been done, no acceptance test for the building has been completed.

Mechanical progress consisted of completing the gas leak test in 115-KW, pressure testing of helium tanks, stress relieving, and the 72" effluent line in 105-KE. Ventilating and cooling systems have been given preliminary tests. Acceptance testing of 105-KW Reactor progressed to about 18% complete. Two acceptance tests have been completed, and 45 of the required 78 acceptance tests have been started. The horizontal control rods have been run under power, and the rod assemblies are being prepared for the acceptance test. Final installation work was being done on Ball 3X assemblies and the vertical safety rod assemblies. This equipment was being prepared for final testing.

The outlet face connectors were completed, and about 2500 front face connectors have been installed hand tight. Piping and supply lines are being flushed, and the entire system is being prepared for the dynamic flow test.

The top skin of 105-KE Reactor has been installed, tested, and accepted. All Ball 3X hoppers have been installed, and the vertical safety rods and step plugs have been installed. Installation of VSR cylinders was started on August 27. Installation of horizontal control rods was 65% complete. Five vertical rows of pigtails are being installed to assist alignment of crossheaders.

Electrical work consisted of wiring for all systems, motors, and their controls. Generally, electrical work has been reduced to allow more assistance at 105-KW Reactor. Communication, alarm, and lighting systems were substantially completed.

Instrumentation work was likewise reduced to assist at 105-KW Reactor. Present work consists of installing tubes, thermocouples, and gauges.

CA-513 - Purex Facility, Part "A"

Design remained at about 99.9% complete. Major design effort was concerned with design changes. During the month there were about 45 design changes

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on items procured by the construction contractor, and about 70 design change notices on workmanship of the contractor. The design work on all phases of the 241-A Waste Disposal Facility has been completed.

Construction progressed 5.5% to a total of 62.9%. Structural work at 202-A Building consisted of painting, small placements of concrete, and minor additions to roofing.

Piping in the Hot Pipe Trench was about 65% complete. The lines are being flushed in preparation for final testing. Field welds have progressed to a total of 1743. Piping in the Sample Gallery pipe chase was 95% installed and tested. The status of pipe jumpers was as follows: welding, 161; framed and painted, 54; and tested, 50. Forty-seven electrical jumpers were completed and stored.

Filter F-A1, the first canyon vessel to be placed in the process cells, was installed on August 23. Fifteen vessels were delivered to 202-A Building, and two tanks were started in mock-up. The four elevators were completed and tested on August 26.

Inside electrical service for 202-A was 60% complete. The main substation was ready to be energized. Auxiliary tests have been completed on the elevators. Wiring was ready to be tested on the remote crane, motors, generators, and amplidyne.

The central control room graphic panels were all set, and 50 of the transmitter racks have been set in place. Control and relief valves are being tested, and copper tubing is being installed.

On August 30, 1954, all the lower floor level of 202-A Canyon Section was found to be covered by 24" of water from a burst supply hose. Total damage of equipment is being appraised. Thirteen motor-generator sets, telephone equipment, and switch controls were partially submerged. The delay to construction has not been estimated.

In 203-A Storage, the required six tanks have been erected, and plug valves and nozzles are being installed. Installation of process pipe from the pump house to the tanks was about 70% complete.

For 211-A Chemical Tank Farm, Tanks 11, 12, 40 and 41 were completed except for plug valves. Tanks 21 and 22 were substantially completed.

At 284-E Power Plant Addition, the coal conveyor was completed except for some wiring and the coal scale. The drying-fires were started in the boilers on August 27, and auxiliary equipment has been operated with light loads. On August 28, the 12" and 18" motorized valves were installed on the export lines.

Progress on the 283-E Filter Plant Addition consisted of replacing faulty sprockets on the flocculator drives and testing the drive on No. 4 basin. The new flowmeter on the 8" and 10" sanitary water lines have been put into service.

At 241-A Tank Farm, concrete was completed in walls of the tanks. The tank area was being backfilled. All cover slabs have been placed on the encasement to 202-A Building. Form supports are being set for erection of dome forms. Three tank liners have been painted.

The 2901 Export Water Line was completed on August 25, 1954.

CA-513-D - Hot Semiworks Conversion

Design had been completed previously; construction progressed 13% to a total of 85%. Testing of "A" and "C" cells has been completed. The pipe line to "C" Tank Farm was completed. Other completions included pipe galleries and the crib for the waste self-concentrator.

CA-514 - 300 Area Expansion Program - Production Facilities

Design completion status remained at 99%; construction progressed 10% to an over-all total of 58%. A revised "Construction Progress Schedule" has been submitted to indicate the late delivery of materials for Phases III and IV of the project.

Installation of interior equipment was about 98% complete. Progress during the month included installation of the autoclave water system, the crane and monorail system for canning areas, the furnace repair monorail, the tank farm, and the switchgear equipment. This recently installed equipment is now being tested.

Modification of the existing 313 Building, Phase III, was about 50% complete. The trichlorethylene head tank has been installed. Ductwork from units 11 and 12 is being installed, and exhaust ducts for the caustic tanks and can cleaning lines are being fabricated in the shops. Phase III work has been rescheduled because of late delivery of material.

All 12 induction furnaces have been partially tested, and one cutoff machine has been tested. Auxiliary equipment which has been installed is being turned over to Manufacturing Department. The installation of process equipment, Phase IV, has likewise been rescheduled because of late delivery of material.

The installation of 8" steam line and the 3" air line was completed, including all insulation.

CG-535 - Redox Capacity Increase, Phase II

Design progressed 1.5% to a total of 98%; construction progressed 3% to a total of 73%. Procurement was 96% complete. All phases of this project are approximately on schedule.

CA-539 - Additional Waste Storage for Redox

Design and lump sum construction had been completed previously. The Minor Construction portion of work progressed 2% to a total of 90%. Remaining

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work consists of a few minor punch list items.

CA-546 - Fuel Element Pilot Plant

Design completion status remained at 94%; construction progressed 8% to a total of 22%. The firm fabrication cost estimate of \$96,000 is being reviewed extensively because it was about \$32,000 above the low bid proposal. Construction by the contractor continues to be delayed because of insufficient details on proposed substitute materials and equipment. A very small percentage of items originally proposed have met requirements of the plans and specifications.

The Phase I portion of work, allocated to Minor Construction, was completed during the latter part of August, 1954.

CG-558 - Reactor Plant Modification for Increased Production

Minor Construction forces removed the "elephant head" mechanism from the 105-D pile unit. Excavation at the 107-B basin was completed, and excavation has started for the extension at 190-DR Building. Expansion joints are being fabricated for the 105-DR effluent line. Shop fabrication of tools and equipment was continued.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 5% to a total of 60%, which is 37% behind schedule; however, plans were made to bring the work to schedule during September, 1954. Construction progressed 6% to a total of 21% which is on schedule.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design of both phases had been completed previously. Construction percentages were revised downward to include Phase II work, as follows: lump sum, 55%; Minor Construction, 91%. The lump sum contractor is excavating for the underground cooling water disposal basin. Placing of rock fill was scheduled to begin during early September, 1954.

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

Design had been completed previously; construction progressed 4% to a total of 23%. The basins are being cleaned in preparation for painting; however, the working time limit for this operation remained at about six minutes.

The cartridge unloader, which had previously failed to function, has now been tested and approved for installation. Fabrication work has been started for the control panels of Basin No. 1.

CA-434 - New Bio-Assay Laboratory

Both design and lump sum construction had been completed previously. Construction remained at 98% complete because no satisfactory quotations had been received for hot plates.

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CA-441 - Solvent Building

Design had been completed previously; construction progressed 32% to a total of 42%. Concrete for the building floors has been placed, and the inside wall forms have been removed and the walls finished.

CA-516 - Gable-Butte Railroad

Design had been completed previously; construction progressed 2% to a total of 82%. No work has been performed on this project since August 3, 1954. The contractor has used his personnel for railroad construction in the 100-K Area and at the Transportation Center.

The contractor appears to be in default of contract, since he has not planned to resume work on the Gable-Butte railroad until after September 1, 1954.

CA-532 - Fiscal Year 1954 Water Tank Replacements

Completion status remained at design 100%, construction 3%. Revision No. 2 of the project proposal is being reviewed for submittal to the AEC during early September, 1954.

CA-533 - Hanford Works Official Telephone Exchange

Design had been completed previously; construction progressed to an over-all completion of 9%. Work is progressing on the re-building of 706 Building and on installation of electrical and mechanical lines outside the building.

CA-543 - Replace Sanitary Tile Field 200 West Administration Area

With design completed, specifications and prints have been transmitted to AEC for approval.

CA-544 - Central Distribution Headquarters

Preliminary design remained at 15% complete. The preparation of a project proposal is being delayed by higher priority work. Further studies of possible uses of the building are being made.

CA-548 - Reactivate Project Proposal for New VSR Test Tower

With scoping completed, the Pile Technology Sub-Section is securing additional and stronger justification for re-submittal of the project proposal.

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

Design had been completed previously; construction was revised downward to 2% in accordance with the revised schedule. A sequence has been established for the performance of Minor Construction phases of Task fabrication and

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installation based upon a "Ready For Use" date of February 1, 1955. This sequence was based upon delivery of hoods, vessels, and miscellaneous fabricated equipment from off-site vendors during October, 1954. Procurement of material for these items has been essentially completed.

CG-551 - Expansion of 234-5 Building Facilities

Design had been completed previously; construction progressed 12% to a total of 52%. Minor Construction has completed the walls and pit for the Radiography Unit. Shop fabrication and testing progressed to 74% complete. Pre-test installation of electrical and piping work was 50% complete.

CA-555 - Graphite Hot Shop and Storage Building

Design progressed 10% to a total of 25%. The project proposal has been sent to the Washington, D. C. office of AEC for authorization. Detailed design is progressing as authorized by the AEC.

CG-556 - X-Level Controlling and Recording Equipment

Design had been completed previously; construction progressed 12% to a total of 52%. Since construction depends upon scheduled outages, an extension of 60 days to complete the project is being requested. A revised construction schedule has been prepared.

CG-562 - Waste Metal Recovery Plant Modifications

Completion status remained at design 100%, construction 74%. The revised project proposal, increasing the scope to include intercycle stripping facilities, is awaiting authorization by AEC. Work proceeded on fabrication of jumpers and the installation of miscellaneous piping necessary for series operation of the feed system.

CG-563 - Modification to 314 Building and Installation of Electroplating Pilot Plant

Design had been completed previously; construction progressed 8% to a total of 80%. The space heater has been set, and electrical work for the heating and ventilating unit was essentially complete. Some items of procurement are delaying construction.

CA-566.- Building for Prototype Physical Constants Test Reactor

Design had been completed previously; construction began and progressed to 6% complete. The Electrical Distribution Unit is installing the outside electrical facilities.

A small force at 2101-M Building continued fabrication of tools and jigs for the Physical Constants Test Reactor. Tooling was about 75% complete, and a few machine trials have been run.

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CG-572 - Particle Problem Animal Exposure Equipment

Completion status remained at design 100%, construction 1%. Revision No. 1 of the project proposal, covering the Phase II work, is awaiting authorization by AEC. Procurement of miscellaneous materials by Minor Construction was continued; however, construction is being delayed until procurement can be completed.

CG-573 - Hanford 3X Program - 300 Area

Design had been completed previously; construction progressed 2% to a total of 98%.

A study is being made, after consultation with the vendor's representative, of two methods to eliminate the ram creeping of the hydraulic presses. One method is to bleed off excess pressure from each press with bleed valves; the other is to energize continually the return solenoid so that the ram will be held down with hydraulic pressure. Punch list items are being cleared.

CG-574 - Irradiation

Scoping is expected to start during the first part of September, 1954.

CG-576 - General Improvements to Laboratory Area - 300 Area

Design progressed 10% to completion; construction progressed 15% to a total of 75%. Section 10-A - 12-A has been completed with exceptions. Work on Room 42-B has been stopped temporarily to await fume hood controls and for review of the cost to complete. Additional work has been delayed pending a review of the financial status.

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

Orders for Gamma Monitoring turrets and recorders have been placed. Bids for the spectrometer are being evaluated by the AEC and G.E. Company.

CG-579 - Effluent Water Monitoring Improvements - 100-C Area

Orders for Gamma Monitoring turrets and recorders have been placed. Bids for the spectrometer are being evaluated by the AEC and G.E. Company.

CG-585 - Oxidizer Off-Gas Treatment, Redox

Design had been completed previously; construction progressed 15% to a total of 89%. The remaining jumpers are being fabricated, and installation of the remaining cold side piping progressed rapidly.

CG-587 - TBP Waste Scavenging

Detailed design is being managed by the Design Section. Construction progressed to 8% complete. Excavation was completed for three cribs and for the BY Tank

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Farm. The concrete flush tank and pipe work are being installed.

CG-558 - Ammonia Scrubbers, Redox

Detailed design is being managed by Design Section. Requisitions are being processed. Fabrication and installation are being delayed until design and procurement are further advanced.

CG-589 - De-jacketing and Ultrasonic Equipment - 105-C Building

Design progressed 9% to a total of 10% complete.

CA-590 - Fly Ash Collection Equipment, Building 384

The project proposal is still awaiting authorization by the AEC.

CG-592 - Laboratory Supply Space, 3706 Building

The project proposal was returned by the AEC with a request that 300 Area buildings be re-surveyed to select an alternate site which can be altered for less money.

CG-594 - 221-T Building Roof Repair

With design completed, construction was begun during the latter part of August, 1954. Minor construction has accomplished 5% of the repair work.

CA-595 - Car Pullers 184 Building Coal Yard - 100-B, D, F, and H Areas

Design Section began detailed design and progressed to 5% complete.

CG-597 - Hanford 4X Program - B & T Plants

Revision No. 1 of the project proposal, requesting authorization of the Third Extraction Cycle for "T" Plant, was authorized as Project CG-603. Revision No. 2 of the project proposal, requesting authorization of the First Cycle Waste Scavenging for "B" and "T" Plants and additional interim funds, is being prepared.

CG-597 - Hanford 4X Program - UO₃

Scoping and design are the responsibility of the Design Section. Scoping of the new UO₃ Plant has been started.

CG-597 - Hanford 4X Program - 300 Area

Manufacturing Department has requested an advance order for an additional welding machine. This request has been forwarded to Design Section which has management responsibility for scoping of this program.

CG-599 - Hanford 4X Program - 100 Area

Scoping was continued by the Design Section.

CA-601 (ER A-3106) - 300 Area General Improvement Program

The project proposal is being routed for signatures.

CG-602 (ER A-2753) - Remote Sampling - Hot Semiworks

With scoping completed, the project proposal has been submitted to the AEC.

IR-178 - 440 Volt Substation - 189-D Building

Design had been completed previously; construction progressed 34% to a total of 73%. Installation of the new disconnect switch and heavier copper wire was accomplished during the August outage. The pad, fence, and grounding were essentially completed.

IR-181 - Temperature Control Improvement - 108-F Building

Design had been completed previously. All engineered equipment was out for bid, and the procurement of non-engineered items and installation work has been released to Plant Forces.

* * * * *

The following studies and Engineering Requests involving emergency work and

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ER A-1213 - Metal Loading Facility, 105 Buildings

The Design Section has advised that the project proposal is being prepared for signatures during September, 1954.

ER A-2749 - Sheltered Welding Manifolds - 200 Areas

With scoping completed, the rough draft of the project proposal is being routed for comments.

ER A-2751 - Removal of Task I and II R.G. Line

The project proposal is being prepared.

ER A-3107 - Hanford Works Laboratory Exceptions

Work on Work Order EE-6207 is awaiting the delivery of 2' / 8" stainless steel tubing. Work Order EE-6176 is essentially completed.

ER A-3108 - Replacement of 313 Building Roof

With scoping and preliminary design each about 75% complete, the Manufacturing Department is assembling information on the cost of maintaining the existing built-up roof.

ER A-6022 - Replacement of 146-FR Raw Water Supply Line

The requested study was about 50% complete. Excavation was scheduled for the first week of September, 1954.

ER E-488 - Tocco Induction Heating Unit, 314 Building - 300 Area

The informal request is being routed for signatures.

C. RELATED FUNCTIONS

The completion of orders for items requiring inspection decreased sharply during the month; however, the number of new orders was almost equal to the number of completed orders. The Corrosion Testing Program decreased another 15% to a total of 356 coupons evaluated during August, 1954. Correspondingly, the number of off-site inspectors has decreased to 66. Two inspectors were on loan to the Purchasing and Stores Section for expediting materials and equipment for the 300 Area Expansion Program.

The number of completed process vessels arriving on site has increased greatly. Five Purex concentrators and one fractionator have been completed and shipped. Eight Pfandler Tanks have been shipped. The 6000 feet of welded pipe which was returned to the vendor during July, 1954, is still being re-worked. None of this material has been shipped.

The problem of excessive gear noise in pulse generators for Purex has not been resolved; however, four large size pulse generators have been shipped.

For 100-K Area the first new casting for the bowls of secondary pumps is being machined at Portland, Oregon, and the other castings are being made in Oakland, California.

Following is a resume of inspection activities during the month:

<u>Item</u>	<u>Number</u>
Total orders on hand requiring inspection	1005
Cumulative number of orders assigned to inspectors	949
Number of orders assigned to inspectors this month	123
New orders received by Inspection during the month	98
Orders completed	105
Total requisitions for engineered equipment transmitted for Expansion Program	30
Total orders of engineered equipment placed for Expansion Program	39

At the end of August there had been grand totals of 3123 Expansion Program requisitions for engineered equipment transmitted, and 3095 placed.

Reproduction output decreased about 16% to a total of 336,179 square feet during the 20 regular working days, including 100 hours overtime. The largest orders processed during the month were 3751 prints for Purex and 3661 prints for 100-K Reactors.

Estimating completed 26 estimates during the month. The completed estimates comprised the following: project proposal - 11, fair cost - 3, and scope - 12.

Field Surveys continued to obtain precise dimensional data for the modification of 100 Areas, and this work was about 52% complete. The Unit also provided routine survey services and control points for new construction. This work included topographical data required for installation of new power facilities in 100-D Area.

D. CRAFT LABOR

Construction millwrights who were employed in the 2101-M Building have protested the assignment of construction machinists to operations in the 2101-M Building. This new stage of the previous quarrel appeared to be a formal recording in the presence of the international representative.

The 900 pipefitters who were discharged from the Purex project on July 29, 1954, for failure to perform assigned work returned to the construction site on August 2. The original dispute was refusal of pipefitters to install hangers which had been fabricated off-site. At least three other issues of a jurisdictional nature were also involved in the dispute.

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Beginning on August 13, the construction of Purex was delayed by work stoppages and walkouts involving carpenters, laborers, ironworkers, and boilermakers. In each case the stoppage was based upon alleged misassignment of work. The strikes were limited to three or four working days, with the exception of carpenters who remained off the job until August 30, 1954. The carpenters' strike included picketing the North Ricland bus lot, thus causing about 3700 men to remain off the job. These pickets were withdrawn on August 27, and a normal work force was present on August 30, 1954.

Percentages of voluntary terminations from the two major contractors remained about level. Kaiser Engineers and associated contractors lost 6%; Blaw-Knox and associated contractors lost about 10%. Voluntary terminations from J. A. Jones Construction Company decreased sharply to less than 1%.

REPORT OF VISITORS

To Hanford

Hans C. Glitsch, Fritz Glitsch, Dallas, Texas, visited W. B. Webster, Separations Projects Sub-Section on August 1 to discuss engineering design for Purex.

Messrs. Holt, Jones, and McIntyre, Electric Boat Company, Groton, Connecticut, visited W. B. Webster on August 25 for engineering consultation on Purex.

Official Trips to Other Installations During August, 1954

R. C. Hollingshead visited Stearns-Rogers, Denver, Colorado, from August 4 to August 7 for design consultation.

D. A. Hoover visited Asco Sintering Company, Los Angeles, California, on August 10 to assist with material procurement and expediting for the Reactor Modification Program.

W. L. Gallagher and K. E. Kolb visited Van Vetter Company, Seattle, Washington, on August 11 to settle outstanding design problems concerning activities of RMA Line in Building 234-5.

J. R. Kelly visited General Metals Corporation, Oakland, California, from August 12 to August 14 to inspect castings for secondary pumps to be used in 100-K Area.

P. J. O'Neil visited Fryer-Knowles, Seattle, Washington, and Western X-Ray, Seattle, Washington, on August 31 to consult on fabrication of equipment for 300 Area Expansion Program.

E. S. Davis visited Hansen, Van Winkle & Munning Company, Mattewan, New Jersey of August 31 to review engineering details of electroplating facilities.

G. L. King, on loan from Financial Department, made a nation wide trip from August 7 through August 27 to study policies of other firms on living allowances.

MONTHLY REPORT
ADVANCE ENGINEERING SECTION
AUGUST, 1954

Editorial responsibility for the Hanford Atomic Products Operation Annual Report to the Atomic Energy Commission for calendar year 1954 has been assigned to the Advance Engineering Section of the Engineering Department.

The IBM machines are being used in a program of calculations of isotope yields during extended irradiation of uranium slugs for exposures up to 10,000 MWD/ton. The calculations are being performed for various slug diameters, various uranium-to-graphite ratios, and various degrees of enrichment of the initial uranium fuel.

Exploratory discussions were held on August 5 and 6 with representatives of the Turbine Division to consider the incentives for altering turbine design to match the characteristics of the nuclear reactor rather than designing the reactor to fit a packaged turbine.

Study of the feasibility of automatic operation of Hanford processes is being started. Automation at Hanford may be unusually advantageous since provision of remote control mechanisms, which is a major expense associated with automation of conventional plants, already exists for a large part of the plant.



W. K. WOODS, MANAGER
ADVANCE ENGINEERING SECTION

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EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY - AUGUST 1954

PERSONNEL PRACTICES

The number of applicants interviewed in August was 2,051 as compared with 1,940 for July. In addition, 150 new applicants applied by mail. Open, nonexempt, nontechnical requisitions increased from 329 at the beginning of the month to 345 at month end. One hundred and thirty-nine employees were added to the roll and 92 removed during the month. Separations rate increased from .67% for fiscal month of July to .85% for fiscal month of August. These rates when converted to annual basis are 8.74% and 11.08%, respectively. During August, 44 new requests for transfer to other type work were received by Employment, and 39 transfers were effected. Attendance recognition awards were distributed to 207 employees in August, including 21 who qualified for four-year awards.

One employee retired during the month and one employee died. Seventy-four visits were made to employees confined to Kadlec Hospital, and 31 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 97.8%, in the Insurance Plan 99.2%, and the Employees Savings and Stock Bonus Plan 49.6%. At month end there were 857 registered under Selective Service and 799 military reservists were on the roll. Since August 1, 1950, 359 employees have terminated to enter military service, of which 110 have returned, 20 have not claimed reemployment rights, leaving 229 still in military-leave status.

A total of 112 new employees attended orientation meetings. Of this number, 92.8% have signed up to participate in the Pension Plan, 99.1% in the Insurance Plan, and 82.1% in the Good Neighbor Fund.

Eighty-four adopted suggestions were approved for awards in August, resulting in cash awards totaling \$2,045.00 with a total net savings of \$12,994.33. An award of \$980.00 was divided between two employees in the Separations Section for their joint suggestion which resulted in savings in material.

The "Let's Talk It Over" program for exempt and nonexempt employees was initiated August 5.

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

The News Bureau issued 31 releases during the month, and signed articles were submitted to three national technical and trade magazines. Six feature stories were furnished to the Tri-City Herald for use in the special edition to be published when President Eisenhower dedicates McNary Dam.

During the month R. W. Jackson, Western Regional Manager, G.E. Public Relations Services Division, visited H.A.P.O. to discuss methods of increasing the flow of public information to national magazines, newspaper syndicates, and wire services.

Employee and Public Relations Summary

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS (Continued)

Two Management-News Bulletins were issued during the month. Community Operations Annual Report for FY 1954 was prepared for distribution to all Richland residents.

The public information version of the H.A.P.O. employee orientation film, "Here's Hanford," was shown to the Richland Rotary Club, the Pasco-Kennewick Rotary Club, two groups of new teachers in Richland, and the Richland Jaycees. A fifteen minute radio program "Hanford 1944" was developed for release and broadcast in connection with the tenth anniversary of the start of the first Hanford reactor next month.

A total of 259 photographic assignments were completed this month, and 11,980 prints were produced.

SALARY AND WAGE ADMINISTRATION

In connection with our proposed plan to install an auditable evaluation system for nonexempt employees, approximately 35 concerns, including most of the large AEC prime contractors and chemical plants throughout the country, were contacted and requested to supply us with copies of their nonexempt salary and hourly rated job evaluation plans.

The Quarterly Report of Exempt Salaries for the period ending June 30, 1954 was completed and distributed. Data were assembled, edited, and sent to Printing for a revised H.A.P.O. Organization Directory to be issued prior to month end.

Analysis of the reconciliations accomplished to date revealed that about ten percent of H.A.P.O. positions have been covered. Actually, the number of employees on the reconciled positions amounted to approximately twenty-five percent of the total payroll.

Titles, position descriptions, and scores for all positions in the Financial and Plant Auxiliary Operations Departments were rechecked in order to establish titles consistent with current organization and to insure a smooth transition from the present salary plan to the Company plan. A similar check has been completed for the Manufacturing Department down through the Unit level. This work has been delayed in hopes that some guidance will be forthcoming from a study being carried on by a group in the Management Consultation Services Division.

Work began on correcting titles for positions in the Engineering, Radiological Sciences, and Employee and Public Relations Departments to insure that wherever possible the position title and the title appearing on the July 1 organization chart are identical. This work involved making comparisons on the E.A.&O. plan and seeing that all salary records are in auditable order.

Our proposal for authority to adopt the Company salary plan has been submitted.

Employee and Public Relations Summary

UNION RELATIONS

On August 4 we reopened the Agreement with Community Firemen to discuss a 10% reduction in base rates. During the month a number of Appendix "A" discussions were held with the individual unions affiliated with the Hanford Atomic Metal Trades Council. Printed booklets reflecting 1954 revisions in the HGU-GE and HAMTC-GE Agreements are expected to be ready for distribution within a matter of two weeks.

A protest has been received from the Millwrights regarding the assignment of Machinists to the 2101 Building operation.

EDUCATION AND TRAINING

There are 51 Technical Graduates on the Rotational Training Program as compared to 59 in July.

Registration began August 30 for the fall semester of the School of Nuclear Engineering and will continue until classes start the week of September 13. Eighteen graduate courses and ten college-level subjects are offered in the fall term. A graduate course announcement has been prepared and mailed to all new technical graduates who have come since 1950 and also to students who have taken a course during the past three years.

The following training programs were held during the month: Principles and Methods of Supervision, Job Instruction Training, Supervisor's Accident Prevention, Effective Human Relations, Conference Leading, and HOBSON II.

Basic Interview Techniques and Employee Check sheets were prepared by Training Staff for all supervisors who will have "Let's Talk It Over" interviews with their nonexempt employees.

HEALTH AND SAFETY

Quarterly checks of frequency of absences appear to be a sensitive index for investigation of causes which may be correctable.

No major injuries occurred in Operations or Community during the month, and there were 307 minor injuries during August, as compared to 310 in July. The plant has operated 188 days without a major injury. This equals 8,259,697 exposure hours.

ORGANIZATION AND PERSONNEL

Total on roll August 1, 1954	896
Accessions	25
Separations	26
Total on roll August 31, 1954	895*

*Totals include 51 Rotational Trainees, 1 ANP Trainee, and 10 Summer Program Trainees.

Employee and Public Relations

PERSONNEL PRACTICES

ACTIVITIES

General

The "Talk It Over" program contemplated to include all exempt as well as non-exempt employees was initiated August 5 through a letter to all department heads and later through the Management News Bulletin and a letter to all supervisors.

Employment

	<u>July, 1954</u>	<u>August, 1954</u>
Applicants interviewed	1,940	2,051

673 of the applicants interviewed during August were individuals who applied for employment with the Company for the first time. In addition, 150 applications were received through the mail.

	<u>July, 1954</u>	<u>August, 1954</u>
Open Requisitions		
Exempt	--	1
Nonexempt	329	345

Of the 329 open, nonexempt, nontechnical requisitions at the beginning of the month, 195 were covered by interim commitments. Of the 345 open, nonexempt, nontechnical requisitions at month end, 214 were covered by interim commitments. During August, 101 new requisitions were received requesting the employment of 149 nonexempt, non-technical employees.

	<u>July, 1954</u>	<u>August, 1954</u>
Employees added to the rolls	129	139
Employees removed from the rolls	<u>97</u>	<u>92</u>
NET GAIN OR LOSS	+ 32	+ 47

Separation Rate:

<u>Fiscal Month</u>		<u>Fiscal Month</u>	
<u>July, 1954</u>		<u>August, 1954</u>	
<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
.41%	1.84%	.57%	2.09%

Over-all Separation Rate:

<u>Fiscal Month</u>	<u>Fiscal Month</u>
<u>July, 1954</u>	<u>August, 1954</u>
.67%	.85%

Employee and Public Relations

PERSONNEL PRACTICES

During August, 13 employees left voluntarily to accept other employment, 12 left to enter military service, and 3 left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-54	437
Number of requests for transfer received during August	44
Number interviewed in August, including promotional transfers	45
Transfers effected in August including promotional transfers	39
Transfers effected since 1-1-54 including promotional transfers	357
Transfers effected in August for employees being laid off	3
Number of stenographers transferred out of steno pool in August	14
Transfer requests active at month end	299

ADDITIONS TO THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
New Hires	8	97	2	107
Re-engaged	-	--	-	---
Reactivates	4	28	-	32
Transfers	-	--	--	---
TOTAL ADDITIONS	12	125	2	139

TERMINATIONS FROM THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
Actual Terminations	18	49	-	67
Removals from rolls (deactivates)	2	20	-	22
Transfers	<u>2</u>	<u>1</u>	<u>-</u>	<u>3</u>
TOTAL TERMINATIONS	22	70	-	92

GENERAL

	<u>7-1954</u>	<u>8-1954</u>
Photographs taken	208	208
Fingerprint impressions	165	225

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	<u>7-1954</u>	<u>8-1954</u>
General Electric cases	68	100
Facility cases	<u>20</u>	<u>30</u>
Total	88	130

Clerical - Twenty-seven clerical applicants were administered the Wonderlic Personnel Test and the Minnesota Clerical Test to aid in selection of new clerical employees.

Employee and Public Relations

PERSONNEL PRACTICES

Instrument Trainees - Eight prospective instrument trainees were tested, five of which are being considered further.

Supervisory Selection Program - Two new groups used the program for the first time, they are Employee Services and the Security and Patrol Units. Including candidates tested for those groups, twenty-one subjects were administered test batteries in connection with the program.

The first women were tested in connection with the Supervisory Selection Program during the month. Two intelligence type tests were used to assist in the evaluation of 12 female candidates for the position of Women's Advisor for our section.

So far this year, 167 candidates have been given test batteries for selection of supervisors. As compared to a total of 145 during 1953, the trend appears to be upward.

Personnel Records and Investigation

INVESTIGATION STATISTICS

	<u>7-1954</u>	<u>8-1954</u>
Cases received during the month	143	164
Cases closed	196	178
Cases found satisfactory for employment	117	127
Cases found unsatisfactory for employment	9	6
Special investigations conducted	10	17
Cases closed before investigation completed	21	38

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	4750
One-year awards made in August for those qualifying in July	60
Total two-year awards to date since January 1, 1950	2402
Two-year awards made in August for those qualifying in July	51
Total three-year awards to date	1148
Three-year awards made in August for those qualifying in July	35
Total four-year awards to date	345
Four-year awards made in August for those qualifying in July	21

SERVICE RECOGNITION

Total Service Recognition Pins presented to date	4251
Five-year Service Recognition Pins presented during August to exempt personnel	7
Five-year Service Recognition Pins presented during August to non-exempt personnel	37

During August, 15 people whose continuity of service was broken while in an inactive status were so informed by letter.

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

The following contacts were made with employees during the month:

Employee contacts made at Kadlec Hospital	74
Salary checks delivered to employees at Kadlec Hospital	28
Salary checks delivered to employees at home	3

At month end, participation in the Benefit Plans was as follows as compared with last month's participation:

	<u>July</u>	<u>August</u>
Pension Plan	97.8%	97.8%
Insurance Plan	99.2%	99.2%
Savings and Stock Bonus Plan	49.4%	49.6%

Nineteen letters were written concerning deceased employees and their families during August, regarding payment of monies from the Company and answering questions.

One employee died during the month, namely:

Manufacturing 8-13-54

Since September 1, 1946, 152 life insurance claims have been paid totaling \$965,013.

One employee retired during the month of August, namely:

Lloyd E. Kincaid W-5436-627 Normal Retirement

During August, 31 letters were written concerning retirement and retired employees providing information of a general or specific nature. To date 308 employees have retired at Hanford, of which 157 are continuing their residence in this vicinity.

A total of 112 new employees attended Orientation Programs given by members of this group during the month of August. Of this number, 92.8% have signed to participate in the Pension Plan, 99.1% have signed up to participate in the Insurance Plan, and 82.1% have signed up to participate in the Good Neighbor Fund.

The present percentage of participation in the Good Neighbor Fund is 67.2%.

Weekly Employees Rating Sheets were distributed during the month of August to all supervision in order that the ratings may be completed during the month of September.

3a-h

1202599

Employee and Public Relations

PERSONNEL PRACTICES

Employee Services

One of our women employees who transferred from the DuPont Company to General Electric on September 1, 1946, and who was employed by DuPont when she was between the ages of 45 and 50, recently elected to work the additional years past her sixtieth birthday in order to permit her to qualify for what we commonly refer to as the DuPont annuity. This is the first of our women employees to have an opportunity to select this option.

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		799
Number of reservists classified in Category A	121	
Number of reservists classified in Category B	81	
Number of reservists classified in Category C	63	
Number of reservists classified in Category D	534	
Number who returned to active duty to date		229
Number who returned to active duty in August		3
Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	2	
Number of reservists classified in Category D	40	
Delays requested (including renewals)		114
Delays granted		106
Delays pending		0
Delays denied		5
Delay requests recalled		3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		857
Employees registered who are veterans		302
Employees registered who are non-veterans		555
Deferments requested to date (including renewals)		1357
Deferments granted		1077
Number of employees for which deferments have been requested		144
Number of employees classified in Category B	0	
Number of employees classified in Category C	1	
Number of employees classified in Category D	143	

Employee and Public Relations

PERSONNEL PRACTICES

Military Reserve and Selective Service

Deferments denied and appealed at state levels	22
Deferments denied and appealed at local levels	0
Deferments denied and held pending appeal at national level	1
Deferments denied by local board and not appealed	14
Deferments denied by state board and not appealed	47
Deferments denied at national level (by Gen. Hershey's office)	2
Deferments denied at national level (by President)	5
Deferments requested, employees later reclassified	0
Deferments requested, later withdrawn	0
Deferments pending	60

Military terminations since 8-1-1950 are as follows:

Reservists recalled	119
Selective Service	235
Women employees enlisted	<u>5</u>

TOTAL 359

Employees returned from military service:

Reservists	61
Selective Service	<u>49</u>

TOTAL 110

Known number not claiming reemployment rights 20

Number of employees still in military-leave status 229

Workmen's Compensation, Liability Insurance and Suggestion Plan

<u>Suggestion Plan</u>	<u>July</u>	<u>August</u>	<u>Total Since 7-15-47</u>
Suggestions Received	125	184	14458
Acknowledgements to Suggesters	120	160	
Suggestions Pending Acknowledgement	17	41	
Suggestions Referred to Depts. for Investigation	207	233	
Suggestions Pending Referral to Departments	41	41	
Investigations Completed and Suggestions Closed	168	152	
Suggestions Adopted - No Award	2	1	
Adopted Suggestions Approved by Committee for Award	58	84	
Total Net Cash Savings	\$ 6,975.05	\$ 12,994.33	
Total Cash Awards	\$ 945	\$ 2,045	
Total Suggestions Assigned to Field for Investigation	695	711	
Total Number Suggestions Outstanding to Departments	679	700	

The highest award of \$980 was divided between two employees in the Separations Section for their joint suggestion to unload caustic soda tank cars from the bottom instead of the top. Savings in material was realized through adoption of this suggestion.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 65 insurance companies and investigation agencies during the month of August, 1954. This is in accordance with an arrangement with the Underwriters whereby employees on this project might be insured on the same basis as those working elsewhere.

Insurance Statistics

Claims reported to Department of Labor and Industries		<u>July, 1954</u>	
	<u>Long Forms</u>		<u>Short Forms</u>
	44		394
		<u>August, 1954</u>	
	<u>Long Forms</u>		<u>Short Forms</u>
	47		429

Total Since Sept., 1946 - 21,975

Claims reported to Travelers Insurance Co.		<u>July, 1954</u>	
		10	<u>August, 1954</u>
			* 14

Total Since Sept., 1946 - 885

*Of the claims reported to Travelers Insurance Company during the month of August two were bodily injury claims, one was both property damage and bodily injury, and eleven were property damage claims.

Employee and Public Relations
Personnel Practices

Workmen's Compensation

-- Date of Injury: 4-10-47; Employer:
Company; Nature of Injury: Back.

A hearing was scheduled for August 4, 1954 in Prosser, at which time the plaintiff's attorney moved for a continuance since he was unable to produce his medical witnesses both of whom were on vacation. Neither the employer nor the Attorney General objected to the motion and it was therefore granted.

Liability Insurance

vs.

On August 28, 1953, age 3, was drowned in the irrigation ditch near the intersection of Duportail and Thayer Drive. Suit was brought by the parents resulting in a judgment of \$22,666. The judge subsequently issued a Memorandum Opinion concluding that the judgment was excessive and that it should be reduced to \$7500 plus costs or in the event the plaintiffs refused the reduction a new trial should be granted. The plaintiffs accepted the reduction, however, upon the recommendation of Travelers' attorney both and the approved Travelers' recommendation to appeal the judgment to the State Supreme Court. The plaintiffs' attorney was served in June with the Notice of Appeal and in August he was served with the Statement of Facts on the matter. The original Statement of Facts was also filed with the Superior Court Clerk.

On July 30, 1954, a bus driven by struck the rear of a private car driven and occupied by and employees. There were four passengers in addition to the driver, in the private car. The damage was slight, however, several of the occupants complained of minor injuries. None of those injured missed any time from work nor have required treatment with the exception of who has been to see Dr. Costello in Kennewick with back complaints. was contacted by Travelers and advised that he received a back injury in the service and that he receives a pension from the government for the back injury. No difficulty is anticipated in the future handling of the claim.

Employee and Public Relations
PERSONNEL PRACTICES SECTION

Technical Recruitment

This unit has now assumed the handling of a major portion of the recruitment activities. Members of the Education and Training Section are handling a small number of cases on a temporary basis. It is anticipated that these activities will be entirely transferred to the Technical Recruitment Unit during the coming month.

Data on 6 new PhD candidates were referred to our office by Schenectady, to give a total of 351 candidates made available from this source during the 1953-54 season. There have been 10 acceptances by PhD candidates, and 4 offers remain outstanding. Three of the outstanding offers should be decided by October 1st, while the fourth may not be determined for several months. Five new PhD's have visited HAPO during the past month, and 6 are scheduled to visit. 2 PhD physicists were interviewed in the east during the past month and it is anticipated both will visit HAPO in the near future. It is estimated there are currently 19 PhD openings.

Last month 33 acceptances were reported for new technical graduates; no new acceptances have been received, and one acceptance subsequently withdrew, leaving this total now 32 for the results of the spring recruiting. All of these candidates have reported for work. Of the 12 business graduates who have accepted, all have reported except one, who is expected to report in September. Eight offers were made during the past month to experienced BS-MS candidates of whom 7 accepted and one rejected.

Plans are currently being laid for the Campus recruiting of BS, MS and PhD candidates, as well as recruiting of experienced technical men during the coming year.

During August, 11 Technical employees resigned from Hanford, 8 left HAPO to enter Military Service and one major employee transferred to another General Electric site.

Employee and Public Relations

EMPLOYEE COMMUNICATIONS AND PUBLIC RELATIONS

During the month of August, the News Bureau issued 31 releases. The break-down by category, distribution, and content was as follows:

<u>Subject</u>		<u>Distribution</u>	
Pay and Benefits	3	Local	20
Employment Services	14	Daily	2
Good Will	4	Columbia Basin NEWS	3
Technology and Research	5	Special	6
Administration and Legal	1		
Real Estate	1	<u>Content</u>	
Education and Library	2	Information	4
Health & Medicine	<u>1</u>	Pictures	4
Total	<u>31</u>	Short releases	18
		Long releases	4
		Feature	1

Of the twenty local releases, three were also sent to the science-engineering list. One of the two daily releases was sent to the Daily B list, and one was sent to the Daily A and local lists.

In addition to the thirty-one news releases, six feature stories were furnished to the TRI-CITY HERALD for use in the edition they will publish when President Eisenhower dedicates McNary Dam. In addition, arrangements were made with the Schenectady News Bureau to furnish the HERALD pictures of the generating equipment GE furnished to McNary Dam.

Suggestions and comments were received during a visit this month by R. W. Jackson, Western Regional Manager, GE Public Relations Services Division, on how the flow of public information to national magazines, newspaper syndicates, and wire services might be increased. A summary of decision reached will be furnished to us in report form by Mr. Jackson.

A member of the Schenectady News Bureau has been assigned to coordinate publicity about Atomic Products Division. Ideas and/or copy for magazine articles and news stories are being sent to him for placement with national publications.

Two recent examples of work designed to increase the flow of information to publications concerning the accomplishments at Hanford include the latest use of the Hanford plastic man and the cooperation here with a Colliers writer to help him prepare the "Atomic Garbage" article which appeared in the August 20 issue of that magazine. A plastic man shipped from here to Cherry Valley, New York, for a celebration also was photographed by one of GE's advertising agencies, and used in ads appearing widely in newspapers and magazines. The "Atomic Garbage" articles quotes GE scientists at Hanford and outlines the waste disposal problems being met by GE scientists and engineers here.

Employee and Public Relations

The Coordinator of all GE NEWS in the Company visited Hanford during the month, and reviewed information and a selection of pictures for a series of three stories he will distribute to all GE NEWS. These stories, which are intended to associate the Company with atomic energy in the minds of employees elsewhere, will be about Richland, typical jobs at Hanford, and a round-up of developments throughout the Company that are leading to peacetime uses of atomic energy.

The first step was completed toward planting a feature article in NATIONAL GEOGRAPHIC magazine. An outline with around thirty sample pictures was sent to the Schenectady News Bureau with a request that they act as a go-between to interest NATIONAL GEOGRAPHIC magazine in such an article.

A local free-lance writer, was furnished a set of pictures and other information he needed to do a feature on "The Loneliest Patrolman at Hanford."

A meeting was held in the office of the Manager of Radiological Sciences to discuss means of disseminating information about the large radiation control zone within the restricted area. A news release for local papers describing the control zone was presented. It was recommended that this release be made voluntarily. A decision was made at the meeting that no release should be made until an inquiry was received from a reporter. Another release will be written and held in readiness for such an inquiry.

Three special releases were sent to the Schenectady News Bureau this month for possible use in obtaining national publicity. One of these concerned the use of Lacto Bacillus Casei (the milk-souring bacteria) for determining the effects of radiation cell growth. Another was a description of the ingenious methods that had to be used in performing a maintenance job in a contaminated area. The third told about the use of mice in determining the ability of lung tissue to absorb various sized radioactive particles.

A journalism professor at the University of Washington who is writing a book to be published by Alfred Knoph visited Hanford during the month to gather information for a chapter of his book which probably will be entitled, "Richland, the Atomic City."

The Schenectady News Bureau was furnished a previously written feature on experimental work with bean plants being conducted by the Biology Section at Hanford. They have interested the science editor of United Press in this story and additional pictures and information were furnished to them this month.

A story about production of radioisotopes at Hanford is being submitted to Oak Ridge for declassification. It is expected that the story will receive nationwide attention in various media, if it is approved for release.

Technical Information Unit will begin soon to keep an up-to-date summary of released technical information about Hanford. The News Bureau will provide all news clippings that it receives as source material for this summary. To make the clipping service more complete, the New York TIMES, the New York HERALD

Employee and Public Relations

TRIBUNE, and the Chicago TRIBUNE will be covered by the clipping service in the future. All clippings will be returned to the News Bureau where the permanent file is maintained.

The following three signed articles were submitted for publication this month: "Reactor Maintenance Problems," by C. B. Wagner, to INDUSTRY AND POWER; the Houston Industrial Health Conference manuscript by Dr. W. D. Norwood, to a journal of the American Medical Association; and a manuscript by Dr. R. R. Sachs to a Hawaiian medical journal.

Articles published during the month or accepted for publication were: "Health Education in Industry," by Ceasar Branchini, in PUBLIC HEALTH REPORTS; a welding article by E. B. Lavelle in INDUSTRY AND WELDING; and "Production Barometer' Can Increase Your Plant's Efficiency," by Fred W. Richardson, in PACIFIC FACTORY. Other articles for publication appear in the following list of manuscripts approved for release during the month:

<u>Presentation or Submission date</u>	<u>Subject and Organization or Publication</u>	<u>Author</u>
8/22	"The Care of Sheep Involved in Radiation Experiments;" Am. Vet. Med. Assoc. Convention, Seattle	L. K. Bustad
8/26	"Atomic Bomb Fall-Out;" Closed Circuit TV demonstration, Seattle	L. K. Bustad
8	"Excitation of Characteristic X-Rays by Beta-Particles;" PHYSICAL REVIEW.	M. B. Leboeuf
8	"Inter-Related Factors in Process Adjustment for Inert-Gas-Shielded Arc Welding;" sent to Y. Lanouette for use in textbook	E. B. Lavelle
8	"Kadlec Hospital Dietician;" WASHINGTON DIETICIAN	M. A. Clark
8	"Microtitration of Free Acid in Uranyl Nitrate Solution;" ANALYTICAL CHEMISTRY	W. N. Carson
8	"Gamma Ray Spectroscopy Using a Gas Filled Proportional Counter;" NUCLEONICS	D. G. Miller
8	"Fiberglass Air Filters for Hot Laboratories;" formal report	L. E. Kattner
9 /23-25	"Personnel Protection in Atomic Industry;" 7th Industrial Health Conference, Houston, Texas	W. D. Norwood
10/14-16	"Extensible Area Specimen Holder for RCA-EMU Models Electron Microscope;" Electron Microscope Soc. of Am. in Illinois	R. Borasky
4/27-1955	"A Control System for the Reactivity Control of Research Reactors;" Nuclear Engr. Conf., L. A., Cal.	W. E. Cawley

The following speeches were arranged during the month:

8/4	"Atomic Energy Act of 1954;" Richland Kiwanis	W. E. Johnson
8/4	"Customer Relations;" Pasco Rotary	V. J. Byron
8/25	"Human Relations;" Richland Kiwanis	V. J. Byron
9 /21	"Industrial Medical and Safety Programs in Industry Handling Radioactive Substances;" Wn. State Med. Assoc.	P. A. Fuqua

Employee and Public Relations

9 /21	"How Industrial Health Fits Into the Community;" NW Industrial Med. Conf.	W. D. Norwood
9 /22	"Hanford Reactor Technology;" Richland Kiwanis	J. H. Warren
10/12	"Industrial Utility of Fission Products;" Richland Naval Reserve	R. E. Burns
10/26	"Hanford Reactor Technology;" Milton-Freewater Rotary	O. C. Schroeder
11/23	"The Optical Illusion of Color;" Richland Naval Reserve	J. M. Holeman

A General Electric float was entered in the Atomic Frontier Days parade on a non-competitive basis. Photos of the float were sent to interested community and public relations people in the East.

The photo tour of Hanford, a display of 23 photographs taken behind the barricade, was exhibited at the hobby show during AFD.

Arrangements were made for a representative of MPO Productions to shoot motion picture footage on the plastic man for inclusion in a film for Monsanto Chemical Company on uses of plastic. The footage was taken at the North Hall of the Library.

Investigations were begun into the possibility of conducting a community attitude survey on a small budget using primarily local talent and equipment.

Subjects emphasized in GE NEWS lead and feature stories during August included: 300th employee retiring under the Pension Plan; progress on the atomic powered submarine, a GE movie; employee who received a certificate of merit for working 10 years at HAPO without an absence or injury, policy changes in Employee Purchase Plan, Atomic Frontier Days activities of interest to HAPO people, new location of 700 Area First Aid Station, two employees who split suggestion award of \$980, GE Nuclear School of Engineering courses, 10th Anniversary of the start of the first Hanford reactor, and changes in the 700-300 Shuttle Bus time schedule in preparation for the move of Transportation to its new facilities.

First installment of an article describing possible appearance of small nuclear weapons which could be brought into the United States for purposes of sabotage was published in the August 27 issue of the NEWS. This educational article originated with the Atomic Energy Commission, and was sent to Hanford by the GE Security coordinator, Schenectady.

Two Management News Bulletins were written and distributed during the month. One concerned this year's nonexempt ratings and concurrent "Let's Talk It Over" interviews, and the other concerned the Company's position on discharge of employees for dishonesty.

Health Bulletin "It's Your Skin," and Safety Bulletin "Case of the Avoidable Injuries," for September were written, approved and sent to printing.

Employee and Public Relations

Assistance was given Personnel Practices in the promotion of this year's "Let's Talk It Over" interviews which included a letter to Hanford management covering disposition of certain interview aids and copies of a 9-Point Job Program "handout."

Guidance in production requirements, scheduling and possible layout of the 1954 Hanford annual report was provided at the request of a member of Advance Engineering who is responsible for preparation of this year's report.

Photographs, captions, and written background material were prepared and forwarded to the Public Relations Services Division in Schenectady at their request for use in a proposed college graduate recruiting booklet to be entitled "General Electric and the Atom".

The August issue of "Your Manufacturing Month" was prepared for distribution to Manufacturing Department exempt employees.

The first in what may be a monthly series of leaflets on the general subject of radiation protection was prepared at the request of the Separations Radiation Monitoring people. Through their instigation, coverage of this initial leaflet was extended to include all production areas.

Assistance was provided Union Relations in the production of two agreement booklets. The Guards Agreement booklet was printed and then, because of two serious errors made by the vendor, was reprinted by the vendor. Production also was begun on the HAMTC Agreement booklet.

A promotion plan for this year's Nucleonics Employees Good Neighbor Fund membership drive, was prepared and approved by the Fund's Board of Trustees.

Community Operations Annual Report for FY 1954, a 12-page, 2-color review of progress within Community Operations was prepared, approved and readied for production. It will be distributed to all Richland residents.

Plans for initiating the "Operation 4S" methods improvement and cost reduction program were completed during the month. The following 4S communications materials also were completed: 4 of the 5 booklets, 3 posters, a paycheck stuffer and a suggestion plan sticker. Three cost reduction films have been ordered and delivery confirmed, and 5 of the Elliot Service Company posters which will be used during the operation 4S communications program have been received. Plans for publicizing this employee communications program in the GE NEWS were made.

Six films were ordered from off-site for showings by plant organizations.

Commercial art work included rough and final layouts for the following: Community Operations annual report, three special signs for Radiological Sciences, the forthcoming Hanford Works telephone directory cover, and three proposed layouts for the front cover of the 1954 Hanford report plus layouts showing three typical pages.

Employee and Public Relations

Layout and final art work was made for new Good Neighbor Fund sticker, a radiation pamphlet (6 illustrations), October safety topic and October health bulletin. Final artwork, involving 16 illustrations, was developed for the #4 GE NEWS message in the "Your Company" series.

Miscellaneous other commercial art work completed during the month included: photo retouching, two editorial cartoons for the GE NEWS, lettering of sign for public information visualizer, and revised layout for a public communications billboard.

Workprint film on the first six months of construction on the 105-K buildings has been rough-edited into three 1200 foot reels covering the subject from the original site survey to the enclosure of the 105-K buildings. Preliminary narration for this portion of the footage has been worked out through cooperation with two members of Design Section.

The Purex Model, now 100% complete, was filmed in color this month. A black and white duplicate of the footage will be used in the Construction Progress Motion Picture, and the color footage will be available for other technical information purposes.

Filming on the Construction Progress Motion Picture has included scenes of the existing areas at angles to show the design changes made at 100-K, the water plant, and extensive aerial coverage of 3000 area, 200 West area and 100-K area.

A 200 foot sequence of the Construction Progress Motion Picture covering the Downcomer Model was used for an intensive study of stresses by project personnel in preparation for the dynamic flow test on the 100-K Water System.

The four HAPO produced motion pictures, "Radiation Hazards Control," "No Comedy in Errors," "Operation ...Sample," and "Getting the Job Done" were sent to the AEC, Savannah River Plant for viewing. As a result, the Commission has asked that prints of these motion pictures be made for their use in training new employees at Savannah River who will be working with radio-active materials. New "Official Use Only" titles have been made and filmed for these.

The shorter, public information version of the HAPO color orientation film, "Here's Hanford," was shown to several public organizations this month, including the Richland Rotary Club, the Pasco-Kennewick Rotary Clubs, two groups of new teachers in Richland, the Richland Jaycees, and Bob Jackson, Western Regional Manager, Public Relations Services during a recent visit. The film and copies of the script have been sent to Mr. Jackson for his use in making a major announcement concerning the Company at a Press Conference scheduled for early September in San Francisco.

A member of the Biology Section was asked to organize a closed-circuit TV program for presentation at the American Veterinary Medical Association meeting in Seattle. Introductory and closing film footage was furnished for use in the presentation. The film footage included scenes from the AEC films "Operation...Ivy," and "Operation...Greenhouse."

Employee and Public Relations

A fifteen minute radio program, "Hanford...1944," was developed for release and broadcast in connection with the tenth anniversary of the start of the first Hanford reactor next month.

One program on the new "Inside Hanford" radio broadcast series was brought to final release form and readied for broadcast on about September 14. Four other programs of the series were progressed to the rough-editing stage, on-the-spot recorded interviews were completed, and only opening and closing remarks remain to be added before the tapes are in final release form.

A total of 259 photographic assignments were completed this month, and 11,980 prints were produced, of which 5,115 were "A" and "B" employee identification badge photographs. A total of 6,865 prints were area and news work.

Project Engineering required 1,192 8 $\frac{1}{2}$ x11 photographic prints on the subject of Reactor Modification, Project CG5-58. Four separate photo shooting sessions were required to complete this request, and a total of 156 negatives were exposed in 100-B, 100-D, and 100-DR areas. Use of photography on this project effected substantial savings of man-hours and dollars.

Purchasing reported that the traffic in requisitions for photographic equipment has been cut almost to zero, thus testifying to the effectiveness of efforts being applied by the Photography Unit on equipment control, proper utilization of equipment now on hand throughout the HAPO, and the improved assistance being supplied to HAPO departments.

See attached Statistical Report for Photography Unit.

	2"	2"	4"	5"	8"	8 1/2"	11"	11"	16"	N	35mm	3 1/4" X 4"	3 1/4" X 4"	3 1/4" X 4"	16mm
	X	X	X	X	X	X	X	X	X	E	Color	B&W	Color	Slides	M. P.
	2"	4"	5"	7"	10"	11"	11"	16"	20"	G.	Slides	Slides	Slides	Film	
PHOTOGRAPHY UNIT															
MONTH OF AUGUST, 1954															
EMPLOYEE & PUBLIC RELATIONS DEPT.															
COMMUNITY OPERATIONS			10												
Library					11										
Recreation					5					5					
Engineering					32					4					
Police			169	4	24					83					
EDUCATION & TRAINING			4		18					9					
EMPLOYEE COMMUNICATION & PUBLIC RELATIONS					14					1					
News Bureau		72		181	476					94					
G. E. News		24	2	4	204					177				3	
Photography			24		90					76					
Special Programs						6				47					
Audio Visual Communications															4,500 ft.
HEALTH & SAFETY					20					21					
Hospital Administration			6								6		14		
Public Health													2		
PERSONNEL PRACTICES															
Employment										177					
ENGINEERING DEPT.															
DESIGN															
Process Engineering				18	123	48			4	91			4		2
ENGINEERING ADMINISTRATION															
Technical Information			4		16	6				18					
PROJECT															
Minor Projects			10		44	27			1	193			42		
TECHNICAL															
Applied Research		20	320		12	78				143				10	
Fuel Technology			65	20	6	2,299				74			35	4	
Pile Technology			4			1,231				34					
Separations Technology			7			174				13					200 ft.
						36									

PHOTOGRAPHY UNIT
 MONTH OF AUGUST, 1954

2"	2"	4"	5"	8"	8 1/4"	11"	16"	N	35mm	3 1/4" X 4"	3 1/4" X 4"	16mm
X	X	X	X	X	X	X	X	E	Color	B&W	Color	M. P.
2"	4"	5"	7"	10"	11"	14"	20"	G.	Slides	Slides	Slides	Film

MANUFACTURING DEPT.		JUNE		JULY		AUGUST	
Manufacturing Administration	8						
PLANT ENGINEERING							
REACTOR				86			
SEPARATIONS				304			
		28	1				
PLANT AUXILIARY OPERATIONS DEPT.							
Security & Patrol	2,034 2,121 184	6					
Radio		6					
RADIOLOGICAL SCIENCES DEPT.							
BIOLOGY		8	4	74			
BIOPHYSICS				11	12		
RADIOLOGICAL ENGINEERING				36			
RADIOLOGICAL RECORDS & STANDARDS				32			
A.E.C. SAFETY				56			
A.E.C. SECURITY		75					
TOTALS	2,994 2,237 825	231	1,311	4,370	7	5	1,498
					6	102	25
							4,700 ft.

TOTAL ASSIGNMENTS		JUNE		JULY		AUGUST	
TOTAL ASSIGNMENTS		279		289			257
TOTAL NEGATIVES		1,380		1,362			1,498
TOTAL PRINTS		13,289		10,174			11,980

Gb-9

12036-13

Employee and Public Relations

UNION RELATIONS

Union Relations - Operations Personnel

On August 4 we reopened the Agreement with Community Firemen to discuss salary revisions. Our proposal was that the continued operation of the fire department by the General Electric Company was contingent upon their willingness to accept a 10% reduction in base rates. Several negotiating sessions were held during the month and consideration was given to several Union counter-proposals for a shorter workweek, holiday improvements, and other benefits to compensate for a salary loss of approximately \$600 per year per employee. The Union will have membership meetings on September 6 and 7 to vote on the Company's last offer which was presented to them on August 25. This offer includes:

1. A continuation of the 70-hour workweek.
2. A revised progression schedule which permits the individual to advance to the job rate in 30 months instead of 36 months. The progression schedule also provides for a 12 months' intermediate hiring rate.
3. Agreement with the principle of basing promotions to exempt positions within the fire department on written examinations plus other qualifications. The details would be worked out between Community management and the Firemen.
4. A revised contract incorporating a substantial number of the revisions negotiated with the Hanford Atomic Metal Trades Council during 1953 and 1954. The body of the Agreement is not open for negotiation and the Agreement is offered to them only as a document that we would be willing to execute by mutual agreement.

The new Agreement offers no significant monetary improvements but primarily reflects improved working conditions. There appears to be a reasonable chance that the Union will accept this proposal. We have been assured that the offer would be acceptable if it included a 67-hour workweek instead of the present 70. Further considerations are being given to this proposal since it represents a minor concession if a few disturbing elements can be satisfactorily eliminated.

During recent negotiations we assured the Council that we were always available for discussions with the individual unions with regard to the Appendix "A" and other conditions peculiar to their craft. During the month a number of such meetings have been scheduled including Chemical Workers, Plumbers, Machinists, Linemen, Carpenters, Millwrights, and Telephone employees. These meetings will undoubtedly continue through September. The Agreement, of course, is closed and any changes arising from these discussions is entirely at the discretion of the Company.

There are no further developments to report in connection with the Council's request for arbitration that we have reported in each of the last four consecutive months. We have managed successfully to keep this matter from going to the arbitrator and our chances of having it withdrawn now seem better than average.

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Employee and Public Relations

UNION RELATIONS

Union Relations - Operations Personnel (Cont'd.)

The Guards Union has requested arbitration of a provision contained in a Procedure Memorandum issued by Patrol and signed by Patrol supervision and the Hanford Guards Union's business representative. The issue involves the placement of a sergeant who was downgraded to a Patrolman. We, of course, are unwilling to recognize the on-the-job understanding as an agreement that is binding upon the Company but, more important, we do not agree that the Procedure Memorandum in question has been violated. Affirmative steps have been taken to again inform supervision throughout the Operation that on-the-job understandings should not be executed with union representatives.

Printed booklets reflecting 1954 revisions in the HGU-GE Agreement were received from the printer but returned to them for correction of several typographical errors. These along with HAMIC-GE Agreement booklets are expected to be ready for distribution within a matter of two weeks.

R. J. Anton, Union Relations Regional Manager who replaced Dupuy, has announced that he expects to make a get-acquainted trip to Richland in September. He has suggested that any questions we may want to ask him while he is here be directed to him in advance so that he may do a little background study of the subjects prior to his trip.

R. B. Britton reported for duty in this Section on August 11. Concurrently, J. R. Fine was assigned to Separations as the 200 Area union relations representative. O. P. Amacker will report to us on September 1 at which time C. J. Sheeran will become the 100 Area representative. The anticipated coverage for 300-700-1100 will necessarily be held in abeyance until the new personnel have been trained.

Information concerning the status of the Oak Ridge strike is rather incomplete but we anticipate a further report from New York on this activity in the near future. The Oak Ridge conference, arranged by Secretary of Labor Mitchell, was held on Monday, August 23. Known to be present at the meeting were AEC General Manager K. D. Nichols and Commissioner Joseph Campbell together with a union delegation headed by CIO President Walter Reuther and James A. Brownlow, President of the AFL Metal Trades Department. We are informed that Reuther suggested that the AEC create a labor advisory committee consisting of representatives of the labor unions involved in atomic work to meet with the Commission every few months. It appears that the net result of the meeting was some nebulous statements by the AEC to the effect that they would try to improve labor relations and solve community problems of workers in atomic plants. It, likewise, appears that the administration realized the embarrassing position they were in as a result of Mitchell's mediating efforts and have withdrawn from the affair as gracefully as possible.

Meanwhile, the 80-day injunction is in effect; the AFL unions have accepted the six cents per hour increase recommended by the Panel and the CIO continues to reject the offer. In view of the fact that a wage reopener is scheduled for January of this year, there is some talk that, at the end of the 80-day period, Carbide may be willing to discuss the wage picture in the light of those pending negotiations.

Employee and Public Relations

UNION RELATIONS

Grievance Statistics:

A total of thirty-six (36) grievances were received and four (4) Step II grievance meetings were held during the month. A breakdown of the grievances received and processed follows:

	<u>ALL DEPARTMENTS</u>			<u>Total Unit</u>	<u>Total Nonunit</u>
	<u>HAMTC</u>	<u>HGU</u>	<u>BSEIU</u>		
Received this month	32	3	0	35	1
Received this year	202	42	1	245	25
Step I					
Pending July 31	0	0	0	0	0
Settled this month*	12	3	0	15	0
Settled this year	132	13	1	146	22
Pending August 31	1	0	0	1	1
Step II					
Pending July 31	14	1	0	15	0
Settled this month**	11	1	0	12	0
Settled this year	60	28	0	88	3
Pending August 31	23	0	0	23	0
Arbitration					
Pending July 31	2	0	0	2	
Settled this month	0	0	0	0	
Settled this year	0	0	0	0	
Pending August 31	3	1	0	4	

	<u>BY DEPARTMENTS</u>					
	<u>Received</u>		<u>Settled Step I*</u>		<u>Settled Step II**</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Manufacturing						
Reactor - Unit	18	90	5	57	4	26
Nonunit	0	5	0	4	0	0
Separations - Unit						
	6	40	4	29	3	12
Nonunit	0	4	0	2	0	1
Metal Preparation - Unit						
	2	23	1	17	1	5

*Grievances brought to Step II prior to June 1, 1954, but never processed by the Union, are, for the purposes of this report, considered settled at Step I.

**Grievances which the Union formally indicated their intention to submit to arbitration but have taken no further action since June 1, 1954, are, for the purpose of this report, considered settled at Step II.

Employee and Public Relations

UNION RELATIONS

BY DEPARTMENTS (Cont'd.)

	<u>Received</u>		<u>Settled Step I*</u>		<u>Settled Step II**</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Plant Auxiliary Operations						
Transportation - Unit	3	15	1	8	2	7
Plant Protection - Unit	5	53	3	21	1	30
Nonunit	0	1	0	1	0	0
Stores - Unit	0	2	0	2	1	2
Electrical Distribution						
- Unit	0	1	0	0	0	1
Telephone - Unit	0	2	0	1	0	1
Nonunit	0	1	0	0	0	1
Employee and Public Relations						
Community - Unit	0	11	0	6	0	2
Hospital - Unit	0	1	0	1	0	0
Nonunit	0	1	0	1	0	0
Radiological Sciences - Unit	1	7	1	6	0	1
- Nonunit	0	4	0	3	0	0
Engineering - Nonunit	0	5	0	7	0	0
Financial - Nonunit	0	3	0	2	0	1

*Grievances brought to Step II prior to June 1, 1954, but never processed by the Union, are, for the purposes of this report, considered settled at Step I.

**Grievances which the Union formally indicated their intention to submit to arbitration but have taken no further action since June 1, 1954, are, for the purpose of this report, considered settled at Step II.

BY SUBJECTS

<u>Unit</u>	<u>Manufacturing</u>		<u>Pl. Aux. Operations</u>		<u>Emp. & Pub. Relations</u>		<u>Radiological Sciences</u>		<u>Engineering</u>		<u>Financial</u>	
	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>	<u>This Mo.</u>	<u>This Year</u>
Discrimination	0	0	0	1	0	1	0	0				
Jurisdiction	10	60	2	20	0	5	1	4				
Health-Safety-San.	0	7	0	2	0	2	0	0				
Hours of Work	0	6	4	28	0	0	0	0				
Overtime Rates	4	17	1	4	0	0	0	0				
Holidays	0	2	0	0	0	0	0	0				
Sick Leave	0	6	0	0	0	1	0	0				
Seniority	7	13	0	5	0	0	0	1				
Grievance Procedure	0	3	0	0	0	0	0	0				
Wage Rates	3	20	1	6	0	2	0	1				
Miscellaneous	2	20	0	6	0	1	0	1				

Employee and Public Relations

UNION RELATIONS

BY SUBJECTS (Cont'd.)

	<u>Manufacturing</u>		<u>Pl. Aux. Operations</u>		<u>Emp. & Pub. Relations</u>		<u>Radiological Sciences</u>		<u>Engineering</u>		<u>Financial</u>	
	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>	<u>This</u>
	<u>Mo.</u>	<u>Year</u>	<u>Mo.</u>	<u>Year</u>	<u>Mo.</u>	<u>Year</u>	<u>Mo.</u>	<u>Year</u>	<u>Mo.</u>	<u>Year</u>	<u>Mo.</u>	<u>Year</u>
<u>Nonunit</u>												
Health-Safety-San.	0	0	0	0	0	0	0	0	0	1	0	0
Overtime Rates	0	4	0	1	0	0	0	2	0	0	0	0
Vacation	0	0	0	0	0	0	0	1	0	0	0	0
Seniority	0	1	0	0	0	0	0	0	0	0	0	0
Cont. of Service	0	1	0	1	0	1	0	0	0	0	0	0
Leave of Absence	0	1	0	0	0	0	0	0	0	0	0	0
Wage Rates	0	1	1	1	0	0	0	1	0	3	0	1
Work Assignment	0	1	0	0	0	0	0	0	0	0	0	2
Miscellaneous	0	0	0	0	0	0	0	0	0	1	0	0

Construction Liaison

We have received a protest from the Millwrights regarding the assignment of Machinists to the 2101 Building operation (see June and July report). The protest was registered in the presence of their International Representative and appeared to be more of a desire to go on the record as opposing the assignment rather than with any hope that they could correct the matter.

A series of work stoppages involving Laborers, Carpenters, Ironworkers, Boilermakers, and Operating Engineers on Kaiser's payroll occurred on August 13 and 16. In each case the issues involved alleged misassignment of work. The strikes were of short duration with the exception of the Carpenters' strike which extended to August 26 at which time a picket line was established at the North Richland bus lot. The picketing caused some 3700 men to stay off the job. Pickets were removed on swing shift on Friday, August 27, and a normal work force was on the job on Monday, August 30.

Employee and Public Relations

SALARY & WAGE ADMINISTRATION

1. In connection with our proposed plan to install an auditable evaluation system for non-exempt employees, approximately 35 concerns, including most of the large AEC prime contractors and chemical plants throughout the country, were contacted and requested to supply us with copies of their non-exempt salary and hourly rated job evaluation plans. To date we have received copies of ten plans, and most of these use the NEMA Plan or a modification of this system for technical as well as clerical and manual type jobs.
2. Revision of the HAPO Non-Exempt Salary Manual was completed. A complete revision of this "master manual" was necessary to reflect the recent general increases, as well as changes made necessary as a result of AEC-GE negotiations in connection with Appendix B of the Prime Contract.
3. Members of the Wage Rate Unit participated in seven Appendix "A" meetings with representatives of various locals, at which requests were made for increases in rates. All but one of the requests have been declined, and a second meeting is to be held with that one.
4. The Quarterly Report of Exempt Salaries for the period ending June 30, 1954, was completed and distributed.
5. Analysis of the reconciliations accomplished to date revealed that about ten percent of HAPO positions have been covered. Actually, the number of employees on the reconciled positions amounted to approximately twenty-five percent of the total payroll.
6. A review of the Position Description Manual was started in preparation for its revision on short notice, probably within 60 days.
7. Data were assembled, edited and sent to Printing for a revised HAPO Organization Directory to be issued prior to month end.
8. Titles, position descriptions, and scores for all positions in the Financial and Plant Auxiliary Operations Departments were rechecked in order to establish titles consistent with current organization and to insure a smooth transition from the present salary plan to the Company plan. A similar check has been completed for the Manufacturing Department down through the Unit level; however, a fair amount of retitling remains to be done below the Unit level. This work has been delayed in hopes that some guidance will be forthcoming from a study being carried on by a group in the Management Consultation Services Division.
9. Work began on correcting titles for positions in the Engineering, Radiological Sciences, and Employee & Public Relations Departments to insure that wherever possible the position title and the title appearing on the July 1 organization chart are identical. This work involved making comparisons on the E.A.&O. plan and seeing that all salary records are in auditable order.

10. Our proposal for authority to adopt the Company salary plan was submitted to top management. L.L. Ferguson, Consultant in the Salary Administration Services Department, has recommended to J.W. Belanger that this proposal be accepted.
11. A review of our July 1 organization, made by the Management Consultation Services Division, was received from W.S. Macaulay, Consultant.

Employee and Public Relations
EDUCATION AND TRAINING SECTION

The report for this Section is submitted under the following headings.

Rotational Training Program

I. Present Assignments

The Technical Graduates on the Rotational Training Program are assigned to departments as follows:

<u>Department</u>	<u>Last Month</u>	<u>This Month</u>
Engineering		
Technical	18	16
Design	14	10
Project	8	7
Manufacturing		
Metal Preparation	2	0
Separations	0	0
Reactor	9	10
Radiological Sciences		
Biology	2	2
Records and Standards	2	2
Bio-Physics	3	3
Plant Auxiliary Operations		
Operations Research	1	1
	<hr/>	<hr/>
TOTAL	59	51

II. Permanent Placements

There were seven assignments off the Program during the month as follows:

Technical	4
Design	1
Reactor	1
Metal Preparation	1
TOTAL	<hr/> 7

At present, out of the 51 graduates on the program, eleven were employed in 1952; however, seven of this number spent three or four normal three month assignments with Inspection away from Richland, and thus they have not been available for openings at Hanford. It is expected that all of these trainees will be off the Program early next year. There are no morale problems in this group even though they have been on the Program longer than usual.

Employee and Public Relations
EDUCATION AND TRAINING SECTION

III. Selective Service

Four technically-trained men were lost to Selective Service during the month making a total of twenty-six lost to this cause to date.

IV. New Hires

One man, a mechanical engineer, reported on the Program during the month.

V. Summer Program

All ten juniors on the Summer Program seem to be well accepted by the departments to which they are assigned.

VI. AMP Program

Arrangements were made during the month to transfer the one trainee on this program to Idaho Falls Operation the first of next month.

VII. Recruitment

Continued assistance was given to the Personnel Practices Section in hiring and transfers of technically trained personnel. This service will be concluded by September 1.

School of Nuclear Engineering

Fall Semester

Registration began Monday, August 30, 1954 and will continue until classes start the week of September 13. Eighteen graduate courses and ten college-level subjects are offered in the Fall Term.

A graduate course announcement has been prepared and mailed to all new technical graduates who have come since 1950 and also to students who have taken a course during the past three years. A full-page announcement and story were prepared for the G.E. News issue of August 27, 1954.

To further supplement the above mailings and announcements, bulletins will be sent to certain section and sub-section managers who have many engineers in their organization. These men will, in turn, pass on copies to the supervisors who are in direct contact with the younger technical men.

Announcements of college-level subjects are in preparation and will be mailed next week to over 500 laboratory assistants, engineering assistants, technicians, cost clerk, and others who are likely to be interested.

Employee and Public Relations
EDUCATION AND TRAINING SECTION

School of Nuclear Engineering (Continued)

Course Considerations

All four cooperating colleges and universities have been notified of our planned Fall graduate courses. Each school has expressed appreciation of the early submission of these courses for their approval. These schools are:

University of Idaho

Oregon State College

University of Washington

State College of Washington

Payment of Fees

During the month the auditors have discussed with us their audit of the School of Nuclear Engineering and their recommendations. Of significance is the recommended procedure to institute a "Payroll Deduction Authorization" for payment of fees for HAPO employees. This method will be tried on a trial basis during the Fall semester with the possibility of permanent adoption for later terms. If the students accept the method, a great deal of financial procedure can be eliminated particularly during the first six weeks of each semester.

Business Administration Courses for Business Graduates

For some time the School of Nuclear Engineering has lacked courses to interest the Business graduates. A survey is being made to determine what courses might be offered and how many graduates would be interested in them. These results will be used in planning specific courses for this group of employees in the next term of the school starting in February.

Employee and Public Relations
Education and Training

TRAINING AND DEVELOPMENT PROGRAM

PRINCIPLES AND METHODS OF SUPERVISION was presented to Group #73 during two weeks of August 9-20, with 10 supervisors completing the course.

JOB INSTRUCTION TRAINING workshop was conducted August 9, 10, and 12. There were 7 supervisors participating in this 10-hour program.

SUPERVISOR'S ACCIDENT PREVENTION program was presented August 17, 25, and 27, with an attendance of 50 supervisory personnel. These four-hour meetings give supervisors an opportunity to discuss the many facets of accident prevention and how they as supervisors can develop their employees' awareness of the desirability of performing their jobs safely.

EFFECTIVE HUMAN RELATIONS Groups #17, 18, 19 met for their second conference August 18 and 25, with 22 supervisors attending. These conferences deal primarily with actual human relations case studies. Cases are presented through various films, records, and written background. Group discussion is conducted on prepared cases as well as on cases presented by supervisors attending the conference.

CONFERENCE LEADING was conducted August 24, with 6 supervisors participating. This program is directed toward stimulating interest in learning and using the techniques of leading group discussions.

HOBBSO II was held August 25, with 6 supervisors in attendance. This presentation emphasizes the effects of war-time economy, government controls, and post-war economy upon our American business system.

All members of Training Unit spent the first part of the week August 2 preparing for moving to the lower floor of W-10 Building. Complete move was made August 4.

On August 4 a member of Training gave a talk on "Customer Relations" to 40 Rotary Club members in Pasco.

Basic Interview Techniques and Employee Check sheets were prepared by Training staff for all supervisors who will have "Let's Talk It Over" interviews with their non-exempt employees. During the week of August 9-13, all supervisors received sample copies of each of these two check sheets.

The Planner of Training and Development, Reactor Section, Manufacturing Department, has requested this unit to conduct meetings on "Non-Exempt Ratings" and "Let's Talk It Over Interviews" for supervisors in Reactor Section. This program is scheduled for September.

Employee and Public Relations
Education and Training

A member of Training is attending the Jobs Methods Improvement Institute conducted by General Electric Company in Burlington, Wisconsin from August 30 - September 2.

All arrangements have been made for FMS dinner meeting for Groups #71, 72, 73 to be held at the Desert Inn Wednesday evening, September 1.

At the request of the Supervisor of Public Relations Unit, a member of Training showed the films "A is for Atom" and "Here's Hanford" on August 16 for a group of visitors from Yakima Jr. College.

Training Representatives and the Clinic Psychologist, Industrial Medical Unit, held an informal round-table discussion August 27th on Human Motivations. This type of In-service training will be continued during the next several weeks.

Training program attendance records for the years 1950 to July 1, 1954 were prepared August 30-31 for the Manager of Education and Training Section.

Material requests from other units and sections during the month were 307 program attendance transcripts, 14 "Unwritten Laws of Engineering", 7 Business English References Sources, and 1,388 "Let's Talk It Over" interview sheets. There were four requests for loan of Training equipment.

Supervisor's Handbook Records:

Number Issued during August - - - 4

Number Returned during August - - 6

On Hand - - - - - 188

Of the 188 handbooks on hand 66 are not usable because of missing pages, 9 have to be checked for completeness and 113 are ready for issuance.

EMPLOYEE & PUBLIC RELATIONS DEPARTMENT
HEALTH & SAFETY SECTION
AUGUST 1954

General

Personnel Changes

Seven additions and six deletions resulted in an increase of one and a roll of 264.

Visits

Dr. Fuqua attended the General Electric Association Island Conference and conferred with Mr. L. E. Newman, Manager of Health and Safety Services. He also attended a meeting in Seattle concerned with better handling of cardiacs in industry.

Mr. E. J. Quigley attended an Institute for Hospital Administrators conducted by the American College of Hospital Administrators and the Association of Western Hospitals at Stanford.

Dr. Sachs attended a meeting of Public Health Officers in Seattle. One consultant from the University of Washington School of Nursing and two nurse consultants from the State Department of Health visited the Public Health Unit.

Industrial Medicine

Medical examinations decreased from 953 to 923 while dispensary treatments increased from 4362 to 4768.

The monthly health topic dealt with the skin.

Sickness absenteeism was 1.26% as compared with 1.15% for July, while total absenteeism was 2.00% as compared with 1.84% for July.

Dr. H. C. Seely was added to the physician staff and Dr. K. A. Nesbitt started a year of implant fellowship training.

Quarterly checks of frequency of absences appears to be a sensitive index for investigation of causes which may be correctable.

Safety and Fire Prevention

No major injuries occurred in Operations or Community and minor injuries were low.

	Minor			Sub Major			Major		
	July	Aug.	To Date	July	Aug.	To Date	July	Aug.	To Date
Plant	310	307	2424	2	0	17	0	0	3
Community	22	30	181	0	0	0	0	0	1
Plant and Community 1954	332	337	2605	2	0	17	0	0	4
Plant and Community 1953			2656			9			10

The plant has operated 188 days without a major injury. This equals 8,259,697 exposure hours.

Kadlec Hospital

A detailed analysis of the P.A.S. consultant study was completed during the month and will shortly be sent to the A.E.C..

HEALTH & SAFETY SECTION

AUGUST 1954

General (Continued)

Kadlec Hospital (Continued)

The average daily census decreased from 70.3 to 57.3 as compared to 78.8 a year ago. No reason for the drop is apparent.

The occupancy percentage for the mixed services was 52.7.

Public Health

Of 276 interviews made by social service counselors, 181 were concerned directly with problems of family relationship.

Costs-July

	June	July	July Budget
Industrial Medicine	\$43,635	\$42,663	\$47,528
Public Health (Oper.)	10,551	11,153	12,391
Kadlec Hospital (Net)	27,688	17,461	28,000
Hospital Expense Credits	2,462	1,791	2,000
Safety & Fire Prevention	13,911	18,553	20,917
Subtotal-Health & Safety (Oper.)	98,247	91,621	110,836
Construction Medical (Industrial and Public Health)	1,122	979	1,143
Total-Operations & Construction	\$99,369	\$92,700	\$111,979

The net cost of operating the Health & Safety Section before charges were assessed to various departments was \$92,700, about \$7,000 less than June and about \$19,000 under the budget.

Industrial and Public Health costs were about as expected. The Safety and Fire Prevention costs were elevated by the amount of the pre-rated portion of the Safety prize award. Kadlec Hospital costs fluctuate greatly and was lower than expected due to marked unpredictable increase in revenue over the previous month.

HEALTH & SAFETY SECTION

AUGUST 1954

Industrial Medical Services

The total number of examinations decreased from 953 to 923. Dispensary visits increased from 4,362 to 4,768. General Electric employees sustained no major or sub-major injuries during the month and contractor employees sustained one sub-major injury.

Nurses on the non-exempt roll remained at 26. Dr. H. C. Seely was added to the physician staff August 16th and Dr. Nesbitt began his A.E.C. Fellowship In-plant training year in Industrial Medicine on August 2nd. One information meeting was held for industrial physicians.

A conference was attended with Dr. Donal Sparkman in Seattle in regard to heart disease and Washington State compensation practices. The objective is to establish criteria and make use of mere expert medical opinion in the handling of such cases. In the event practical methods can be worked out it would permit mere liberal employment of some types of heart cases.

The Chemical Hazards Committee met on August 27th. Topics discussed included respirators, noise measurements, changes in maximum allowable concentrations, lead and carbon dioxide exposure.

The Health Activities Committee met on August 19th and the topic on "Skin" was presented. Material on this subject was prepared for distribution throughout the plant. The sickness absenteeism was 1.26% as compared to 1.15% for July. Second quarter frequency reports showed that there were 213 men absent three times, 63 absent four times, 24 who had five absences, 4 who had six, 1 who had seven, 2 had eight, 1 had nine and 1 had eleven. Among female employees 47 were absent four times, 19 had five absences, 8 had six, 3 had seven and 1 had eight. Out of 387 on the special absence frequency report (3 or more times for men and 4 or more times for women) 99 had also been on the first quarter list.

Interviewing of new supervisors was begun during the month. The objective is to orient the new supervisor in regard to absenteeism control and the personal factors involved in accidents from the medical standpoint.

Net costs incurred in July amounted to \$34,540, an increase of \$135 when a comparison is made with the previous month. Nearly all categories of expense continued on the same level with the exception of maintenance and certain supply costs. However, increases in one category were offset by corresponding decreases in other categories.

Costs-Operations

	July	June	Increase (Decrease)
Salaries	\$32,912	\$32,695	\$ 217
Continuity of Service	2,962	3,270	(308)
Laundry	292	220	72
Utilities, Transportation, Maintenance	3,475	6,053	(2,578)
Supplies and Other	4,096	2,427	1,669
Total Gross Costs	43,737	44,665	(928)
Less: Revenue	1,074	1,030	44
Expense Credits	8,123	9,230	(1,107)
Net Cost of Operation	\$34,540	\$34,405	\$ 135

HEALTH & SAFETY SECTION

AUGUST 1954

Industrial Medical Services (Continued)

Costs-Operation (Continued)

In relation to the budget for July, actual costs were nearly \$6,000 less than anticipated. Salaries and related continuity of service, shop and laboratory supplies and maintenance charges were all less than budgeted. In addition, charges to other departments for services rendered were higher than originally estimated.

HEALTH & SAFETY SECTION

AUGUST 1954

<u>Industrial Medical Services (Continued)</u>	<u>July</u>	<u>August</u>	<u>Year to Date</u>
<u>Physical Examinations</u>			
<u>Operations</u>			
Pre-employment	108	104	712
Rehire	19	19	211
Annual	108	182	2075
Interim	299	238	1220
A.E.C.	27	35	257
Re-examination and recheck	190	158	1640
Termination	101	83	632
Sub-total	852	819	6747
<u>Contractors</u>			
Annual	9	8	107
Pre-employment	32	64	522
Recheck	23	20	254
Termination and Transfer	37	12	167
Sub-total	101	104	1050
Total Physical Examinations	953	923	7797
<u>Laboratory Examinations</u>			
<u>Clinical Laboratory</u>			
Government	119	149	1093
Pre-employment, Termination, Transfer	1662	1674	12766
Annual	593	951	11332
Recheck (Area)	1293	1187	5868
First Aid	0	1	65
Clinic	259	309	2981
Hospital	4100	3727	34161
Public Health	3	0	3
Total	8029	7998	68269
<u>X-Ray</u>			
Government	17	16	131
Pre-employment, Termination, Transfer	199	214	1729
Annual	445	464	3634
First Aid	67	63	678
Clinic	204	235	1662
Hospital	282	229	2338
Public Health	7	25	79
Total	1221	1246	10251
<u>Electrocardiographs</u>			
Industrial	64	59	569
Clinic	0	1	9
Hospital	31	25	262
Total	95	85	840

HEALTH & SAFETY SECTION

AUGUST 1954

<u>Industrial Medical Services (Continued)</u>	<u>July</u>	<u>August</u>	<u>Year to Date</u>
<u>First Aid Treatments</u>			
<u>Operations</u>			
New Occupational Cases	592	645	3317
Occupational Case Retreatments	1238	1390	10478
Non-occupational Treatments	2117	2258	20178
Sub-total	3947	4293	33973
<u>Construction</u>			
New Occupational Cases	85	100	578
Occupational Case Retreatments	273	280	1608
Non-occupational Treatments	57	95	455
Sub-total	415	475	2641
Facility Operators	0	0	149
Total First Aid Treatments	4362	4768	36763
<u>Major Injuries</u>			
General Electric	0	0	4
Contractors	0	0	0
Total	0	0	4
<u>Sub-Major Injuries</u>			
General Electric	2	0	17
Contractors	0	1	2
Total	2	1	19
<u>Absenteeism Investigation</u>			
Calls Made	2	2	33
Employee Personal Illness	2	2	25
No. absent due to illness in family	0	0	1
No. not at home when call was made	0	0	7

HEALTH & SAFETY SECTION

AUGUST 1954

Kadlec Hospital

The average daily adult census decreased from 70.1 to 57.3 as compared to 78.8 a year ago. This represents an occupancy percentage of 52.6 broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 52.7; Obstetrical Service 51.9. The minimum and maximum daily census ranged as follows:

	<u>Minimum</u>	<u>Maximum</u>
Mixed Service	39	58
Obstetrical Service	7	18
Total Adult	46	68

The average daily newborn census decreased from 13.4 to 12.7 as compared to 11.6 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	4.48
Obstetrical	4.67
Newborn	2.80

This increase in nursing hours results from the substantial decrease in patient census which occurred during August. By not replacing a number of nursing personnel who have recently terminated and scheduling more vacations during this period of low census, the number of nursing hours rendered did not reach the same peak as in June even though the census dropped lower than in June.

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of July was 2.29. When newborn infants are included, the ratio is 1.92.

The net expense for operation of Kadlec Hospital for July was \$17,461 as compared to \$27,688 for June. Summary is as follows:

Kadlec Hospital net expense	\$17,461
This represents a decrease of approximately \$10,000 due to a slight increase in gross costs and a substantial increase in revenue resulting from an increased patient census. Expense credits also decreased slightly.	

Mr. E. J. Quigley attended an Institute for Hospital Administrators and Assistant Administrators at Stanford University in California. It was conducted by the American College of Hospital Administrators and the Association of Western Hospitals.

Following is a summary of employee relations meetings held in the Health and Safety Section during August:

	<u>Meetings</u>	<u>Attendance</u>
Hospital	9	73
Industrial Medicine	2	10
Public Health	5	47
Safety & Fire Prevention	1	13
General	2	12
Total	19	155

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HEALTH & SAFETY SECTION

AUGUST 1954

Hospital Unit (Continued)	July	August	Year to Date
<u>Kadlec Hospital</u>			
Average Daily Adult Census	70.1	57.3	73.9
Medical	21.0	16.3	20.6
Surgical	25.1	23.0	29.7
Pediatrics	9.6	7.1	11.5
Mixed	55.7	46.4	61.8
Obstetrical	14.4	10.9	13.3
Average Daily Newborn Census	13.4	12.7	11.6
Maximum Daily Census:			
Mixed Services	74	58	99
Obstetrical	21	18	21
Total Adult Census	93	68	116
Minimum Daily Census:			
Mixed Services	37	39	28
Obstetrical Service	9	7	4
Total Adult Census	48	46	39
Admissions: Adults	524	471	4340
Discharges: Adults	523	463	4338
Medical	154	103	1121
Surgical	191	192	1813
Pediatrics	74	78	689
Mixed	419	373	3623
Obstetrical	104	90	715
Newborn	91	86	644
Patient Days: Adult	2173	1777	17951
Medical	652	506	5005
Surgical	777	714	7222
Pediatrics	298	219	2786
Mixed	1727	1439	15013
Obstetrical	446	338	2938
Newborn	416	399	2822
Average Length of Stay: Adults	4.2	3.8	4.1
Medical	4.2	4.9	4.5
Surgical	4.1	3.7	4.0
Pediatrics	4.0	2.8	4.0
Mixed	4.1	3.9	4.1
Obstetrical	4.3	3.8	4.1
Newborn	4.6	4.0	4.4
Occupancy Percentage: Adults	64.3	52.6	67.8
Medical	56.8	44.1	55.7
Surgical	78.4	71.9	92.8
Pediatrics	50.5	37.4	60.5
Mixed	63.3	52.7	70.2
Obstetrical	68.6	51.9	57.6
Newborn	51.5	48.8	51.1
(Occupancy Percentage based on 109 adult beds and 26 bassinets.)			

HEALTH & SAFETY SECTION

AUGUST 1954

Hospital Unit (Continued)	July	August	Year to Date
<u>Kadlec Hospital (Continued)</u>			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.92	4.48	
Obstetrics	3.74	4.67	
Newborn	2.68	2.80	
Avg. No. Employees per Patient (excluding newborn)	2.29		
Operations: Major	68	70	619
Minor	72	91	707
E.E.N.T.	39	33	492
Dental	0	0	10
Births: Live	102	79	644
Still	2	0	6
Deaths	3	2	37
Hospital Net Death Rate16%	.18%	.34%
Net Autopsy Rate	33.3	50.0	45.9
Discharged against advice	2	3	14
One Day Cases	140	131	1204
Admission Sources:			
Richland	69.5	71.8	72.5
North Richland	11.6	11.7	12.4
Other	18.9	16.5	15.1
Admissions by Employment:			
General Electric	64.9	68.2	68.0
Government	2.9	3.6	3.1
Facility	7.6	4.9	5.4
Contractors	18.5	17.8	17.9
Scheels4	.8	1.2
Others	5.7	4.7	4.4
Hospital Outpatients-F.A.	654	612	4421
Recovery Bed Patients-F.A.	0	0	71
<u>Physical Therapy Treatments</u>			
Clinic	265	227	2459
Hospital	113	70	703
Industrial: Plant	152	217	1487
Total	530	514	4649
<u>Pharmacy</u>			
No. of Prescriptions Filled	2993	2644	41076
No. of Store Orders Filled	584	543	4215

HEALTH & SAFETY SECTION

AUGUST 1954

<u>Hospital Unit (Continued)</u>	<u>July</u>	<u>August</u>	<u>Year to Date</u>
<u>Kadlec Hospital (Continued)</u>			
<u>Patient Meals</u>			
Regulars	3408	2694	27855
Children under 8	403	274	3207
Specials	1240	1083	9147
Softs	630	613	6513
Tensils	52	40	890
Liquids	171	99	1316
Surgical Liquids	178	97	796
Total	6082	4900	49724
<u>Cafeteria Meals</u>			
Noon	1791	1752	14554
Night	387	373	2621
Total	2178	2125	17175

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HEALTH & SAFETY SECTION

AUGUST 1954

Public Health Unit

Communicable diseases remain at about the same level with chickenpox and measles leading the list. With the return of members from vacation, the number of home visits made by nurses increased approximately 20%, the increase reflected chiefly in the calls made on expectant mothers and newborn infants.

Morbidity calls showed a slight rise due to an increase in problems of upper respiratory infections.

Miss Julia Anderson, University of Washington School of Nursing, Field Consultant, made a visit to the department. The two student nurses completed their field experience and returned to Seattle.

Miss Lillian O'Callaghan and Miss Elsie Brandt, Field Nurse Consultants from the State of Washington Department of Health, visited the department in terms of Public Health nursing practices.

The Health Officer attended the quarterly meeting in Seattle where state and local public health matters concerning budget, legislation, new communicable disease regulations, psittacosis and polio were discussed.

Of the 276 interviews made by social service counselors during August, 181 were concerned directly with problems of family relationship. Ninety-six of these were devoted toward improving relationships between parents and children, while 85 were focused on solving marital conflict.

In 38 instances, children were seen in direct therapy interviews. Twenty-three interviews were held with adolescents who were involved in emotional conflict. Individual personal problems were the focus of 44 interviews with adults.

Problems growing from physical and mental illness were met in 15 instances. Two families were helped to find adequate care for children during an emergency period and one family was given temporary financial assistance.

Plans were inspected and approved for a new drive-in restaurant.

Routine examination of food handling establishments indicate that they are operating satisfactorily.

Emphasis is being placed regarding regular cleaning of stove hoods due to recent fire in a restaurant. Ten permits were issued for operation of itinerant food establishments.

One case of food poisoning involving four persons resulted from consumption of contaminated carrot and celery juice obtained from Yakima County. Bacteriological examination revealed enterococcus and coliform organisms capable of causing food poisoning.

HEALTH & SAFETY SECTION

AUGUST 1954

Public Health Unit (Continued)

Pasteurized milk samples continued to be satisfactory from the bacteriological standpoint. Two pipe line milk installations on dairy farms were approved. Twenty-two Grade A dairy farms were inspected and found to be operating satisfactorily.

Bacteriological examination of water and sewage samples were satisfactory. Samples collected weekly from swimming and wading pools showed negative coliform counts.

Mosquito control activities consisted mostly of larviciding and fogging of residential areas. A total of 715 gallons of insecticide was utilized. A decrease in the prevalence of adult mosquitoes warranted changing crew to regular day shift.

HEALTH & SAFETY SECTION

AUGUST 1954

<u>Public Health (Continued)</u>	<u>July</u>	<u>August</u>	<u>Year to Date</u>
<u>Education</u>			
Pamphlets distributed	11,008	11,002	99,191
News Releases	8	6	93
Staff Meetings	0	2	10
Classes	5	8	126
Attendance	5	30	3,073
Lectures & Talks	0	2	42
Attendance	0	50	2,030
Films Shown	6	4	91
Attendance	111	51	3,485
Community Conferences & Meetings	14	29	212
Radio Broadcasts	0	9	67
<u>Immunizations</u>			
Diphtheria	9	27	63
Diphtheria Booster	105	4	244
Diptussis Booster	2	0	2
Tetanus	9	27	64
Tetanus Booster	105	4	243
Pertussis	4	11	41
Pertussis Booster	104	4	242
Smallpox	53	2	180
Smallpox Revaccination	112	1	591
Tuberculin Test	0	7	19
Immune Globulin	33	31	785
Other	0	0	4
<u>Social Service</u>			
Cases carried over	101	99	748
Cases admitted	14	9	134
Cases closed	16	12	124
Remaining case load	99	96	758
<u>Activities:</u>			
Home Visits	7	10	62
Office Interviews	255	266	2,442
Conferences	38	30	370
Meetings	9	10	64
<u>Sanitation</u>			
Inspections made	141	161	1,097
Conferences held	27	9	130
<u>Bacteriological Laboratory</u>			
Treated Water Samples	214	256	1,627
Milk Samples (Inc. cream & ice cream)	38	15	290
Other bacteriological tests	538	375	4,513
Total	790	646	6,430

HEALTH & SAFETY SECTION

AUGUST 1954

Public Health (Continued)	July	August	Year to Date
<u>Communicable Diseases</u>			
Chickenpox	22	14	290
German Measles	3	8	45
Generrhea	0	1	1
Impetigo	0	1	4
Influenza (U.R.I.)	0	0	4
Infectious Mononucleosis	0	0	1
Infectious Hepatitis	4	1	13
Measles	8	12	1,378
Meningitis	0	1	1
Mumps	8	7	36
Pinkeye	0	0	6
Polioeyelitis	1	1	2
Ringworm	0	0	6
Roseola	1	2	8
Scabies	0	0	1
Scarlet Fever	2	1	63
Streptococcal Infections-Throat	0	0	3
Syphilis	0	1	1
Tuberculosis	0	0	1
Whooping Cough	3	9	69
Total	52	59	1,933
Total No. Nursing Field Visits	444	597	5,218
Total No. Nursing Office Visits	49	69	781

COMMUNITY SECTION

AUGUST 1954

ORGANIZATION AND PERSONNEL:

	<u>BEGINNING OF MONTH</u>		<u>END OF MONTH</u>	
	<u>Exempt</u>	<u>Nonexempt</u>	<u>Exempt</u>	<u>Nonexempt</u>
Community Administration	1	0	1	1
Maintenance & Renovation Unit	10	139	11	143
Police Unit	17	31	17	31
Commercial & Residential Property Unit	10	22	9	22
Fire Unit	65	0	67	0
Transfer Study	1	1	1	1
Community Operations Administration	1	1	1	1
Electrical Unit	5	16	5	16
Engineering Unit	7	3	7	4
Recreation Unit	3	4	2	3
Water & Sewerage Utilities Unit	4	22	4	22
Library Unit	4	9	4	9
Public Works Unit	<u>5</u>	<u>54</u>	<u>5</u>	<u>52</u>
	133	302	134	305
	<u>Exempt</u>	<u>Nonexempt</u>		
Additions to Payroll	3	8		
Removals from Payroll	0	4		
Transfers In	0	2		
Transfers Out	2	3		
Net Increase	<u>4</u>			

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RENOVATION AND MAINTENANCE UNIT

	<u>Exempt</u>	<u>Nonexempt</u>
Employees - Beginning of the Month	10	139
Transferred in	0	1
Transferred out	0	1
Reactivations	1	0
New hires	0	4
Terminations	0	0
Total Employees - end of month	11	143

General:

All service truck and shop stocks were inventoried during the month.

EXTERIOR PAINT REPORT

FOREMAN	PAINTERS	TRUCK DRIVERS	TOTAL
Chambliss	21	1	22
Lukins	22	1	23
Tappan	<u>10</u>	<u>1</u>	<u>11</u>
Total	53	3	56

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	244	44	96	148
B	288	46	195	93
D	2	0	0	2
E	43	4	35	8
F	115	24	86	29
G	5	0	0	5
H	152	31	123	29
L	39	12	16	23
Tract	20	2	6	14

Total	908 (1440)	163	557	351
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Est. M.H. B. F.	19,575	Actual M.H. B. F.	21,974
Est. M.H. This Mo.	<u>8,782</u>	Actual M.H. This Mo.	<u>8,011</u>
Total Est. M.H.	28,357	Act. M.H. Total	29,985

Total Season Estimate 47,732 hours.

INTERIOR REDECORATING REPORT

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	171	1	171	0
B	370	2	370	0
C	0			
D	5	0	5	0
E	42	0	42	0
F	112	0	112	0
G	3	0	3	0
H	80	0	80	0
K	0			
L	4	0	4	0
M	2	0	2	0
Q	9	1	9	0
R	2	0	2	0
S	2	0	2	0
T	7	0	7	0
U	8	1	8	0
V	40	1	40	0
Y	199	0	199	0
Z	5	0	5	0
1BP	42	1	42	0
2BP	206	11	206	0
3BP	193	0	193	0
Tract	10	0	10	0
1BR Apt.	12	0	12	0
W-13 Apt.	2	0	2	0
TOTAL	1526	18	1526	0

18 Units added

Est. MH B. F.	72,693	Actual MH B. F.	70,928
Est. MH This Mo.	<u>761</u>	Act. MH This Mo.	<u>781</u>
Total Est. MH	73,454	Total Actual MH	71,709

FOREMAN: B. C. BAIN 4 Painters 1 Carpenter

PLUMBING SHOP

<u>JOB DESCRIPTION</u>	<u>NO. COMPLETED</u>
Electric water heaters replaced	22
Laundry tubs replaced	2
Shower stalls replaced	5
Plumbing Work Orders	28
Plumbing for floor and sink replacement	53
Cleared major sewer stoppages caused by tree roots	54
Steam work orders	25

Made steam inspection each week on Government owned commercial buildings, dormitories and apartments.

Excavated sewer lines, water lines, and all leaking or broken underground piping with backhoe machine so repairs could be made.

Replaced street steps 51

FOREMAN - H. F. BERNDT

SERVICE ORDER CREW

The following is a status report on service orders:

A. On hand at the beginning of the month	119
B. Received during the month	1735
C. Completed during the month	1652
D. On hand at the end of the month	204

E. A total of 852.1 hours were expended on work orders.

F. A total of 40 conventional house roofs were given one coat of roof coating. Also, the roof over the Richland Recreation Hall, barber shop, and cafe was roof coated.

G. Backlog of service orders by craft:

Electrical	17
Plumbing	116
Carpentry	<u>71</u>
Total	204

FOREMAN - L. F. CARPENTER

RENOVATION AND LABOR CREW

FOREMAN - B. C. BAIN

The following services were performed during the month:

Vacant houses renovated	55
Vacant house interiors completely painted	11
Trash pick-ups	47 locations
Minor carpenter repairs	57 houses
Minor carpenter repairs to dormitories	7 rooms

Sprayed entire dormitories M-12 and M-13 for pest control.

Provided weekly service of delivering linens and janitorial supplies to occupied dormitories.

MECHANICAL SHOP

FOREMAN - Z. H. MAYBERRY

The following services were completed during the month:

A. Millwright Crew:

Furnace service orders	75
Routine furnace inspections	450
Dormitory cooler service calls	25

B. Sheetmetal Crew:

Replacement of shower stalls	5
Replacement of gutters	7
Fabricated window dividers - Ranch Houses	36

Installed metal flashing on roof of Diamond's Store, Hurt's Apparel, Style Center, Mickey's Shoe Renewing, Richland Supply and the Richland Recreation Hall.

C. Truck Drivers and Servicemen:

Sidewalk removals for concrete	16
Sidewalk repairs - blacktop	13
Top soil delivered	14
Tree removal orders	28

LINOLEUM AND CARPENTER SHOP

FOREMAN - R. M. MARTIN

<u>JOB DESCRIPTION</u>	<u>NO. COMPLETED</u>
Replaced bath wall tile	6
Repaired bath wall tile	5
Replaced bath floor linoleum	15
Repaired bath floor linoleum	1
Replaced kitchen floor linoleum	21
Repaired kitchen floor linoleum	2
Replaced steps and landing linoleum	1
Replaced bedroom floor linoleum	2
Repaired utility room floor linoleum	2
Replaced dining room floor linoleum	1
Repaired dining room floor linoleum	2
Replaced living room floor linoleum	1
Replaced floor tile - commercial facilities	1
Replaced sink top linoleum	45
Repaired sink top linoleum	5
Replaced work bench linoleum	3
Replaced broken kitchen sinks	2
Replaced sash balances	2
Raised slab	8
Repaired porches	154
Jack and Shim	1
Repaired thresholds	24
Sidewalk forms	17
Repaired exterior doors - Shop	4
Repaired wall	1
Repaired floor boards	1
Repaired Ranch window screens - houses	52
Repaired basement steps	1
Checkpoint - routine	9
Checkpoint - work orders	61
Paint touch-ups	60
Interior carpentry repairs - houses	1

COMMUNITY SECTION
 RICHLAND POLICE DEPARTMENT
 MONTHLY REPORT
 AUGUST 1954

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	17	31
Transfers In	0	0
Transfers Out	0	1
New Hires	0	1
Terminations	0	0
Total - End of Month	17	31

GENERAL

During the month of August, the street striping program was completed, consisting of approximately 4.3 miles of center-line and no passing zones, 250 crosswalks, 4.2 miles of yellow curbing, striping on-street parking stalls and three parking lots, and street stencils consisting of approximately 450 letters.

During the month, we replaced the faces of approximately 100 obsolete yellow stop signs with new red stop sign faces. The new red stop signs are being put into general use throughout the city of Richland, making a total of approximately 275 red stop signs now installed. It is anticipated that prior to the end of this fiscal year, all stop signs in the city will be refaced with the new red stop sign faces.

TRAFFIC	1954		1953		1954	1953
	July	Aug.	July	Aug.	Total To Date	Total Same Period
Reportable accidents	12	23	12	17	157	162
Property damage accidents	10	19	12	12	135	138
Injury accidents	2	4	0	5	22	23
Total persons injured	2	4	0	5	22	31
Fatal accidents	0	0	0	0	0	1
Accidents-daylight hours	11	16	11	13	111	113
-darkness	1	7	1	4	46	49
Accidents-business district	5	2	5	6	40	62
residential "	6	14	7	9	91	78
other "	1	7	0	2	26	22
Accidents investigated	8	17	4	14	97	105
Criminal complaints filed	6	14	4	9	72	83
Violations contributing to accidents:						
Negligent driving	1	4	0	0	28	19
Fail. to yield r.o.w.	8	8	3	8	49	59
Following too closely	2	1	4	2	26	27
Drunk driving	0	0	0	2	2	5
Pedestrian violation	0	2	0	0	5	3
Inattention to driving	0	1	0	1	1	2
Reckless driving	0	2	0	0	5	4
Speeding	0	0	0	2	1	5
Unsafe speed	0	1	1	0	21	8
Improper backing	0	1	0	0	8	10
Disregarding stop sign	0	1	0	0	1	4
Hit and run	0	0	0	0	0	1
Improper passing	1	1	1	0	2	3
Improper turn	0	0	1	0	1	3
Failure to signal	0	0	0	0	1	0
Wide right turn	0	0	0	0	1	0
Wrong side of road	0	0	1	0	0	1
Improper parking	0	1	0	0	1	0
Bicycle violation	0	1	0	1	3	1
Asleep at wheel	0	0	0	1	0	1
North Richland:						
Reportable accidents	5	7	7	4	60	66
Property damage accidents	4	6	5	4	50	54
Injury accidents	1	1	2	0	10	12

Richland	1954		1954		1953	
	July	Aug.	Ave.Per July	Accident Aug.	Ave.Per July	Accident Aug.
Accident property damage	\$3882.00	\$4,414.62	\$323.50	\$191.94	\$204.17	\$304.41

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TRAINING

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction was as follows:

38 Caliber Revolver	1/2 Hour	Qualifications on the Army-L Course as follows:
Total number of men reporting at the range	11	Marksman 2 18% Sharpshooter 2 18%
Number of men fired over the Army-L Course	11	Expert 4 36% Unqualified 3 28%

ACTIVITIES AND SERVICES

	JULY		AUGUST	
	Richland	North Richland	Richland	North Richland
Bank escorts and details	2	7	4	5
Bicycles impounded	7	1	1	0
Bicycle violations	0	0	1	3
Bicycles registered	33	0	60	0
Children lost or found	7	2	15	2
Complaints investigated (no enforcement action)	20	7	45	6
Deaths reported	1	0	0	0
Dog, cat, loose stock complaints	5	0	0	3
Dogs, cats, reported lost or found	11	2	5	4
Doors, windows found open in facilities	92	12	42	6
Emergency messages delivered	19	99	11	98
Fires investigated	12	1	7	3
Guns registered	9	0	16	0
Law enforcement agencies assisted	8	0	7	0
Letters of inquiry	93	0	137	0
Miscellaneous escorts	7	3	5	1
Persons injured by dogs	1	0	2	0
Plant-departments assisted	15	3	15	0
Prisoners processed through Jail	13	20	17*	18
Private individuals assisted	30	3	30	2
Property lost or found	21	6	12	1
Records inquiries	93	0	88	0
Reports processed through Records	227	155	251	161
Street lights out reported to Electrical	93	21	114	20
Traffic safety meetings (August attendance - 230)	5	0	6	0
Total	824	342	891	333

*Two prisoners handled for the Security Patrol during August.

MONTHLY REPORT
 HIGHLAND POLICE DEPARTMENT
 (HIGHLAND - NO. RICHLAND)
 AUGUST 1954

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich. No. Rich.							
PART I								
1. Criminal Homicide	3	2	-	-	-	1	1	
a. Murder & Non-Neg. Mans.	15	13	-	-	9	2	-	
b. Mans. by Negligence	2	1	-	-	-	-	1	
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break. & Entry								
6. Larceny Over \$50.00	20	16	1	-	10	2	2	
Under \$50.00								
7. Auto Theft								
TOTAL PART I CASES								

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich. No. Rich.							
PART II								
8. Other Assaults	1	3	-	-	-	1	2	
9. Forgery & Counterfeit	-	-	-	-	-	-	-	
10. Embezzlement & Fraud	1	2	-	-	-	-	2**	
11. Stolen Prop;Buy;Rec.	-	-	-	-	-	-	-	
12. Weapons;Carry;Poss.	-	-	-	-	-	-	-	
13. Prostitution	-	-	-	-	-	-	-	
14. Sex Offenses	-	-	-	-	-	-	-	
15. Offenses Ag. Fam.&Child	-	-	-	-	-	-	-	
16. Narcotics	-	-	-	-	-	-	-	
17. Liquor Laws	-	-	-	-	-	-	-	
18. Drunkenness	9	8	-	-	-	9	8	
19. Disorderly Conduct	-	-	-	-	-	-	-	
20. Vagrancy	-	-	-	-	-	-	-	
21. Gambling	-	-	-	-	-	-	-	
22. Driving While Intoxicated	1	3	-	-	-	1	3	
23. Viol. Rd. & Dr. Laws;	3	1	-	-	-	1	1	
Fail. to Stop & Identify	20	15	-	-	-	20	15	
Speeding	13	10	-	-	-	13	10	
Stop Sign	8	5	-	-	-	8	5	
Reckless Driving	3	2	-	-	-	3	2	
Right of Way								

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART II								
Negligent Driving	16	17	-	-	-	-	16	17
Defective Equipment	3	-	-	-	1	-	2	-
Illegal Passing	-	2	-	-	-	-	-	2
Parking	3	30	-	-	-	1	3	29
24. All Other Traff. Viol.	22	8	-	-	-	-	22	8
25. All Other Offenses:								
26. Malicious Mischief	5	1	-	-	-	-	-	-
Vandalism	6	3	-	-	5	-	-	-
Bike Violations	2	3	-	-	2	-	-	1
Public Nuisance	1	2	-	-	2	3	-	-
Investigation	6	1	-	-	-	-	1	2
Prowler	4	2	-	-	6	1	-	-
Disturbance	2	-	-	-	1	-	-	-
Pickup for Outside Ag.	1	-	-	-	1	-	1	-
Viol. of Dog Ord.	4	-	-	-	-	-	1	-
Damage to Property	1	-	-	-	-	-	4	-
Illegal Shooting	1	-	-	-	-	-	-	-
Dog Shooting	1	-	-	-	1	-	-	-
Molesting	1	1	-	-	1	-	-	1
Lewdness	-	1	-	-	-	-	1	1
Contributing to Delinq.	1	-	-	-	-	-	1	-
Aiding & Abetting	1	-	-	-	-	-	1	-
27. Suspicion	-	-	-	-	-	-	-	-
TOTAL PART II	142	120	-	-	21	6	112	107
PART III								
28. Missing Persons	3	1	-	-	3	1	-	-
Lost Persons	13	1	-	-	13	1	-	-
Lost Animals	9	6	-	-	2	1	-	-
Lost Property	31	10	1	-	15	4	-	-
29. Found Persons	-	-	-	-	-	-	-	-
Found Animals	2	2	-	-	-	-	-	-
Found Property	8	-	-	-	7	-	-	-
TOTAL PART III	66	20	1	-	40	7	-	-

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OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART IV								
30. Fat.M.V.Tr. Acc.	-	-						
31. Pers.Inj.M.V.Tra.Acc.	4	1						
32. Prop.Dam.M.V.Acc.	19	6						
33. Other Traffic Acc.)							
34. Public Accidents)							
35. Home Accidents)							
36. Occupational Acc.								
37. Firearms Accidents								
38. Dog Bites	2	-						
39. Suicides	-	-						
40. Suicide Attempts	-	-						
41. Sud. Death & Bod Found	-	-						
42. Sick Cared For	-	-						
43. Mental Cases	-	-						
TOTAL PART IV	25	7						

COMPOSITE TOTALS

PART I, II, III, IV CASES	253	163	2	-	71	15	115	109
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*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: order from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column only in that there was no arrest. **Larceny by check cleared for previous year.

Property reported stolen	Richland	\$1,892.79
Property reported stolen	No. Rich.	\$ 866.50
Property recovered	Richland	\$1,673.34
Property recovered	No. Rich.	\$ 503.50

**RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)**

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash. Ore. & Calif. Six Months (July-Dec.)	One Month Average	1953		1954		1954	
		July - Dec.	July - Dec.	July	August	July	August
Murder	.468	1	-	-	-	-	-
Robbery	2.154	-	-	-	-	-	-
AGG. Assault	2.183	-	-	-	-	-	-
Burglary	80.750	19	1	1	1	18	18
Larceny	228.430	91	12	12	12	18	18
Auto Theft	40.380	6	4	4	4	2	2

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec.)	One Month Average	1953		1954		1954	
		July - Dec.	July - Dec.	July	August	July	August
Murder	.378	1	-	-	-	-	-
Robbery	7.900	-	-	-	-	-	-
AGG. Assault	2.280	-	-	-	-	-	-
Burglary	69.550	19	1	1	1	18	18
Larceny	211.700	91	12	12	12	18	18
Auto Theft	38.950	6	4	4	4	2	2

The percentage of offenses committed by persons under the age of 25 years is shown:

	Richland 1953		Richland 1954	
	July	Dec.	July	August
Robbery	-	-	-	-
Burglary	22%	-	-	-
Larceny	18%	-	8%	22%
Auto Theft	17%	-	-	50%

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

**RICHLAND POLICE DEPARTMENT
(COMMUNITY OF NORTH RICHLAND)**

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

Wash. Ore. & Calif. Six Months (July-Dec. 1953)	One Month Average	1953		1954	
		July - Dec.	July	July	August
Murder	.187	-	-	-	-
Robbery	5.170	-	-	-	-
Agg. Assault	4.240	-	-	-	-
Burglary	32.300	4	2	2	-
Larceny	91.370	60	12	12	15
Auto Theft	16.150	13	1	1	1

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec. 1953)	One Month Average	1953		1954	
		July - Dec.	July	July	August
Murder	.227	-	-	-	-
Robbery	3.160	-	-	-	-
Agg. Assault	.910	-	-	-	-
Burglary	27.820	4	2	2	-
Larceny	84.680	60	12	12	15
Auto Theft	15.580	13	1	1	1

The percentage of offenses committed by persons under the age of 25 years is shown:

	No. Richland 1953		No. Richland 1954	
	July	Dec.	July	August
Robbery	-	-	-	-
Burglary	-	-	50%	-
Larceny	19%	-	8%	66%
Auto Theft	20%	-	-	100%

Note: Comparative statistics for juvenile offenses are not available in current issues of the Uniform Crime Report published by the Federal Bureau of Investigation.

MONTHLY REPORT		RICHLAND POLICE DEPARTMENT										JUVENILES INVOLVED			AUGUST								
OFFENSES		NO. CASES		JUVENILES		SEX		5		11		12		13		14		15		16		17	
<u>RICHLAND</u>																							
Investigation	3	2-M	M														1						1
		1-F	F																				1
Malicious Mischief	5	8	M	1									1				4						1
Larceny	2	2	M					2															
Dog Shooting	1	1	M																				1
^C ^{or} ¹ ⁰ Vandalism	2	3	M	1				1					1										1
Unauthorized Shooting	1	1	M																			1	
Injury to Property	1	1	M																				1
TOTALS	15	19						1	3	2	2	2	2	2	5	2	1	2	1	3	1	3	
<u>NORTH RICHLAND</u>																							
Larceny	1	2	M																				1
TOTALS	1	2						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

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RICHLAI POLICE DEPARTMENT
 RICHLAND JUSTICE COURT CASES
 AUGUST 1954

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. SUSP. OR REV.	CASES ORIG. MON.	OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
DEFECTIVE EQUIPMENT	7	4	2	1								\$ 8.50	\$ 22.50	
DISREGARD BARRICADE	2	2	2				1		2			10.00	52.50	
DRUNK DRIVING	2	2	2									17.50	7.50	
F.T. DIM LIGHTS	3	1	2									25.00	10.00	5.40
F.T. LEAVE NAME AT SCENE OF ACCIDENT	2	1	1											
F.T. REPORT ACCIDENT	1	1	1										27.50	
F.T.S. & I.	1	1	1									25.00		
F.T.Y.R.O.W.	6	4	2							2		50.00	72.50	50.00
ILLEGAL PARKING	4	4	4									14.00		
ILLEGAL PASSING	2	1	1							1		7.50	7.50	
INVALID DRIVERS LICENSE	18	9	8	1						2		51.00	42.00	10.00
INVALID LICENSE PLATES	3	1	2									35.00	10.00	10.00
LEFT SCENE OF ACCIDENT	1	1	1										52.50	
NEGLIGENT DRIVING	26	12	7	4	3				1	3		212.50	317.50	30.00
NO REGISTRATION	1	1	1										7.50	7.50
RECKLESS DRIVING	4	2	14	2	2				2	1		170.00	60.00	
SPEEDING	24	8	8	2	2							70.00	65.00	20.00
STOP SIGN	15	5	8	2									40.00	
BREACH OF PEACE	1	1	1										12.50	10.00
CONT. TO DEL. OF MINORS	2	2	2											
CRUELTY TO ANIMALS	1	1	1										27.50	
DOG ORDINANCE	2	1	1					2					10.00	7.50
INJURY TO PROPERTY	2	2	2											
LARCENY BY CHECK	1	1	1										14.20	10.00
PETIT LARCENY	2	2	2										22.50	
PUBLIC INTOXICATION	9	4	5									65.00	37.50	14.00
PUBLIC NUISANCE	3	3	3										47.50	35.00
THIRD DEGREE ASSAULT	2	2	2											
THROWING BURNING MATERIAL FRM VEHICLE	2	2	2											
TOTAL	149	70	59	12	8		7	1	5	12		\$761.00	\$966.20	\$209.40

THREE DRUNK DRIVING CASES AMENDED TO NEGLIGENT DRIVING. THREE RECKLESS DRIVING CASES AMENDED TO NEGLIGENT DRIVING. ONE LARCENY OF AUTO CASE AMENDED TO INJURY TO PROPERTY. ONE AIDING AND ABETTING LARCENY OF AUTO CASE AMENDED TO INJURY TO PROPERTY.

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RICHLAND POLICE DEPARTMENT
 NORTH RICHLAND JUSTICE COURT CASES
 AUGUST 1954

VIOLATION	NO OF CASES		NO OF CASES		WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. SUSP. OR REV.	CASES ORG. INCL. MON. VIOL.	BAIL FORF.	FINES	FINES SUSP.
	CONV.	FORF.	CONT.	DISM.								
DEFECTIVE EQUIPMENT	3	1	2			1				7.50		
DR. WHILE LIC. REV.	1										105.00	
DRUNK DRIVING	2	2					2				7.50	
F.T. DIM LIGHTS	1									10.00		
F.T.S. & I.	1	1										25.00
F.T.Y.R.O.W.	2	2								15.00		10.00
FOLLOW TOO CLOSE	2	1								73.00		
ILLEGAL PARKING	29	21	7							15.00	3.50	5.00
ILLEGAL PASSING	4	2								50.00	32.50	7.50
INVALID DRIVERS LICENSE	13	4	2			2		1			25.00	12.50
INVALID LICENSE PLATES	1	1						2		190.00	292.50	40.00
NEGLIGENT DRIVING	19	14	5			1					97.50	
RECKLESS DRIVING	5	4	1					3		80.00	40.00	
SPEEDING	15	5	4							60.00	27.50	
STOP SIGN	13	4	2					2				15.00
CONT. TO DEL. OF A MINOR	1											
INDECENT LIBERTIES	1											
LARCENY BY CHECK	1										12.50	
LEWDNESS	2	1										
PUBLIC INTOXICATION	10	4	6			2				77.50	52.50	
PUBLIC NUISANCE	2	1								15.00	12.50	
THIRD DEGREE ASSAULT	4	3								25.00	45.00	
VIOLATION OF S.R. ACT	1	1										
TOTAL	133	57	56	18	2	11	5	5	5	\$618.00	\$808.50	\$115.00

ONE SECOND DEGREE ASSAULT CASE AMENDED TO THIRD DEGREE ASSAULT.

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
AUGUST - 1954

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	July	August	July	August	July	August	July	August
Richland	12	23	0	0	0	0	2	4
North Richland	5	7	0	0	0	0	1	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield		Reckless & Drunken		Other Causes	
	July	August	July	August	July	August	July	August
Richland	1	4	8	8	0	2	3	9
North Richland	1	1	3	1	0	0	1	5

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.
Richland	0	0	0	0	12	0	0	0	0	1	0	0	12	1
No. Richland	0	0	0	0	1	1	0	0	1	0	0	0	2	1

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way		Neg. Drv.		Parking V.		Other V.		Totals	
	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.
Richland	10	23	11	15	3	4	1	7	4	4	15	17	11	4	21	38	76	112
No. Rich	4	15	7	11	3	2	1	5	3	2	8	17	60	29	13	25	99	106

24 HOUR AVERAGE TRAFFIC VOLUME COUNT FOR THE WEEK ENDING AUGUST 27th WAS 3,457 VEHICLES ON VAN GIESSEN EAST OF THE BY-PASS.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT
COMMUNITY SECTION
August, 1954

PERSONNEL - COMMERCIAL & RESIDENTIAL PROPERTY UNIT:

	<u>August</u>	
	<u>Exempt</u>	<u>Non-Exempt</u>
Beginning of Month	10	22
End of Month	9	22
Net Change	-1	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>	
	North		North		North	
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>
July	1,641	198	120	1	1,761	199
August	<u>1,646</u>	<u>199</u>	<u>120</u>	<u>1</u>	<u>1,766</u>	<u>200</u>
Net Change	/5	/1	0	0	/5	/1

SUMMARY OF ROUTINE ITEMS PROCESSED:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>	
	North		North		North	
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Total</u>
Work Orders	29	15	7	0	36	51
Back Charges	1	0	0	0	1	1
FY Work Orders	639	229	25	0	664	893
FY Back Charges	29	1	4	0	33	34

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Lease:

Wilfred H. Allen - to provide for the leasing of space in the Medical-Dental Building for the practice of dentistry.

2. Supplemental Agreement:

L. R. Heaton - to provide for alteration work to Building No. 1130, installation of gasoline pumps, adjustment of rental payments and to make certain other changes in connection with the operation of the Bus Depot.

3. Business Development:

- a. Mr. Austin Whilwhite's proposal was accepted in connection with leasing space in the Government-owned Building at 94 Lee Boulevard. He proposes to operate a marine supply business.
- b. Advertisements inviting inquiries on two vacant land sites and one government-owned building available for lease were placed in nine Northwest newspapers.

GENERAL:

A. Commercial:

- 1. Carl Benward d/b/a Richland Electric Center, terminated his sublease agreement with L. G. Cook.
- 2. Safeway Stores, Inc. terminated their lease of the Government-owned building located at 615 Goethals Drive.
- 3. Wesley Purdin, d/b/a General Collection Agency, terminated his sublease agreement with Richland Development Company, Inc.
- 4. Esko Rentola, d/b/a Art & Painting Service, opened for business in the L. G. Cook Building located at 883 Stevens Drive.
- 5. The Utoco Service Station, located at the corner of Duane and Lee opened for business.
- 6. John H. Browne, opened a collection agency in the Richland Development Company, Inc., Building.
- 7. L. R. Heaton, started construction of a service station to be operated in conjunction with the Bus Depot.
- 8. James R. Parcell started construction of his service station building to be located at Duane Avenue and Lee Boulevard.
- 9. Orville W. Couden started alteration and remodeling work on the drive-in restaurant building, to be located at 831 Stevens Drive.
- 10. Jimmy Walsh, d/b/a Richland Tire Exchange, started alteration and remodeling work on the building located at 837 Stevens Drive.
- 11. Hand's Buy-Rite Drugstore, at North Richland, was rendered unusable by fire on August 6, 1954. This facility will not be rebuilt.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises in Richland and North Richland.

Richland

Garden Golf Club
 Service Stations
 Drive-In Restaurants
 Mobile Housing Units

North Richland

Drugstore

1203550

COMMERCIAL & RESIDENTIAL PROPERTY UNIT - COMMUNITY SECTION

August, 1954

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

B. Noncommercial:

	JULY			AUGUST		
	North		Total	North		Total
	Richland	Richland		Richland	Richland	
1. Government-Owned Buildings						
a. Churches	2		2	2		2
b. Clubs and Organizations	5		5	5		5
c. Government Agencies	2		2	2		2
Total	9		9	9		9
2. Privately-Owned Buildings						
a. Completed and in Use	10	1	11	10	1	11
Total	16	3	19	16	3	19
3. Church Plots and Buildings in Private Ownership	2		2			
4. Pasture Land Permits	104		104			

7-28-54

COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

PROGRESS REPORT

	Orders incomplete as of July 31, 1954	Orders issued 7-31 to 8-31	Total orders Incomplete as of August 31, 1954
Service orders	346	1851	460
Work orders	674	370	701
Service charges		222	

Sewer stoppages due to tree roots . 20

<u>Principal work order loads</u>	Incomplete as of July 31, 1954	Incomplete as of August 31, 1954
Laundry tub replacement	37	43
Bathroom renovations (tub, tile, lino.)	0	0
Tileboard bathroom	9	15
Kitchen floor linoleum	74	81
Kitchen cabinet linoleum	102	89
Shower stall	5	0

159 alteration permits were issued, as compared to 132 issued in July.

Install air conditioner	10	Install automatic dryer	37
Install automatic washer	29	Convert to oil	21
Install fence	8	Basement excavation	9
Install cupboard in kitchen	1	Install basement partition	1
Install clothes poles	3	Remove wall in basement	1
Install additional wiring	8	Remove broom closet	3
Sand floors	2	Install driveway	4
Install back door	2	Remove bedroom cabinet	1
Install tool shed	1	Relocate coal bin	1
Install clothes closet	1	Install dishwasher	1
Install patio	3	Install fireplace	1
Remove laundry trays	6	Install coal stoker	3
Install dishwasher	1	Install garbage disposal	1

629 inspection were made, as compared to 911 made in July.

Alteration permits	82	Basement	1
Bathroom	2	Doors	6
Fill	2	Floorboards	4
Laundry trays	5	Linoleum	32
Lot lines	3	Paint	15
Porch and steps	10	Recall of range & refers	12
Shower stall	5	Screens	1
Sidewalks	19	Shakes	1
Sinks	6	Toilet seat	9
Trees	7	Yard	1
Recheck on renovations	36	Dormitories	79
Miscellaneous	41	Cancellation	71
Renovations	92	Shows (new tenants)	84
Walls	3		

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COMMERCIAL AND RESIDENTIAL PROPERTY UNIT

TENANT RELATIONS

TENANT STORES

<u>Merchandise Issued</u>	<u>Total Amount</u>
Shades	558
Reflectors	16
Drip trays	16
Meat tenders	9
Ice trays	42
Hydrator glass	7
Furniture delivered	29
Furniture recalled	259
Range parts	3
Refer parts	5
Cooker pots	1
Space heaters	8
Door stops	8

RECALL AND DELIVERY OF RANGES AND REFRIGERATORS -- MONTH OF AUGUST

	DELIVERY		RECALLED	
	REFERS	RANGES	REFERS	RANGES
1Br.				
2Br.	3TA	1SC	1TA	
3Br.			2TA	2SC
A	5TA	3SC	4TA	2SC
B	1TA	2SC	3TA	2SC
C	1 S082		1S082	
E	1TA	1GE	1TA	1GE
F		2SC		1SC
H			1TA	3SC
U	1GE		1GE	
Y	3GM 1GE	3GE		5GE
	1TA			
<hr/>				
Total	17	12	14	16

IN WAREHOUSE

TA refers 7'-- 17
 GE refers 8'-- 1
 GM refers 7'-- 1
 Frig S082 --- 2
 SC ranges ---- 16
 GE ranges ---- 12

COMMERCIAL & RESIDENTIAL PROPERTY UNIT

RESIDENTIAL LEASES

AUGUST 1954

DORMITORY REPORT

Dormitories:	<u>Beds Available</u>	<u>Vacant Beds</u>	<u>Occupied Beds</u>
Men	477	27	450
Women	381*	41**	340*
Total	858*	68**	790*

*This includes 2 beds used for Dorm

**This includes 12 vacant beds in Dorm M 13

WAITING LISTS

	<u>Single Rooms</u>	<u>Double Rooms</u>
Men	12	0
Women	3	0

The following Dormitories are in Stand-by condition:

W 21 50 beds	W 15 50 beds
W 17 50 beds	M 7 39 beds
W 16 50 beds	
Total beds: 239	

HOUSING
CANCELLATION AND ALLOCATIONS

Voluntary terminations	29	Houses allocated to new tenants	61
R.O.F.	0	Exchanged houses	8
Discharge	1	Moves (within the village)	34
Transfers	6	Turnovers (divorce, death, schools)	13
Retirement	2	Total leases signed	120
Move off project	23	Total cancellations	121
Divorce	0	Wherry house move to GE house	4
Death	1	Houses assigned As Is	43
Move to Wherry House	0	Houses sent to renovation	51
Misc.	0	Applications pending	275
Not eligible	0		
Total	62		

RIGHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING AUGUST 31, 1954
 HOUSES OCCUPIED BY FAMILY GROUPS

	Conven	A&J	T	Pre Cut	Ranch	Pre Fab	Dorm Apt.	A&J Apt.	2BR Apt.	4th Hsg.	Tract	Total
G. E. Employees	2226	255	10	385	835	1130	10	53	63	202	38	5207
Comm. Fac.	90	17		29	61	50		4	3	7	2	263
AEG	66	29		21	57	15		4	3	13	3	211
Other Gov't	7	1			3	1						12
Post Office	6				2	8				1	3	20
Schools	58			7	11	46			1	1		124
Comm. Activities	10			2	6	4					1	23
Med. Facilities	3	18			3	1				3		28
Chas. T. Main	3			2	5	6				2		18
Kaiser Eng.	6	7			7	1						21
J. A. Jones	2	2			2							6
Blaw-Knox	3	2		2	1							8
P. S. Lord					1							1
Minor Const.					1			1				2
Commonwealth Inc.						1						1
Cisco Const. Co.		1										1
Steel Const. Co.	1											1
Not Certified	3					2		1			1	7
Turnover	1					1						2
House Ex.	3				1							4
Total	2488	332	10	448	996	1266	10	63	70	229	48	5960
Assigned Leases												
Written	3				2	1						6
Assigned Leases												
Not Written	4	1		2	2	8		1		1		19
Available For												
Assignment	5					4						9
Total	2500	333	10	450	1000	1279	10	64	70	230	48	5994

	Begin Month	Moved In	Moved Out	End of Month	Diff.
Conventional Type	2487	+34	-33	2488	+1
A&J Type	332	+3	-3	332	
"T" Type	10	+1	-1	10	
Precut Type	448	+5	-5	448	
Ranch Type	996	+12	-12	996	
Prefab Type	1262	+38	-34	1266	+4
Dorm Apts.	10	+1	-1	10	
A&J Apts.	64	+1	-2	63	-1
2BR Apts.	70	+1	-1	70	
Youth Housing	230	+1	-2	229	-1
Tracts	54		*-6	48	-6
Total	5963	+97	-100	5960	-3

* Removed from Housing Records and Transferred to Vernita Orchards Contract

COMMUNITY SECTION
 RICHLAND FIRE DEPARTMENT
 MONTHLY REPORT

August 1954

<u>Organization and Personnel</u>	<u>Exempt</u>	<u>Non-Exempt</u>
Employees - Beginning of Month	65	0
Transfers In	0	0
Transfers Out	0	0
Terminations	0	0
New Hires	2	0
End of Month	67	0

<u>Fire Protection</u>	<u>Richland</u>	<u>North Richland</u>
Fire Loss (Estimated) Government	\$ 70.00	\$ 0.00
Personal & Army	0.00	24.00
August Total	\$ 70.00	\$ 24.00*
Year's Total	\$10,349.23	\$4,085.00*

*Fire loss figures not yet available on the August 6, Drug Store fire in North Richland

	<u>Richland</u>	<u>North Richland</u>
Response to fire alarms	26	22
Investigation of Minor fires and incidents	2	0
Ambulance Responses	19	
Inside Schools or Drills	27	5
Outside Drills	20	11
Safety Meetings	8	3
Security Meetings	3	1
Fire Alarm Boxes Tested	217	116

Five standbys were made at the AEC Airport during August for aircraft landings and take-offs.

Fire Companies made pre-fire surveys of all public schools during August.

Chief Quane attended the annual conference of Pacific Coast Inter-Mountain Association of Fire Chiefs held in Long Beach, California, August 24 to 27, inclusive.

During August, 5000-feet of 2 1/2-inch fire hose was pressure tested.

Fire Marshal's Monthly Activities:

A total of 189 Richland and 97 North Richland building fire inspections were conducted, resulting in 61 hazard reports being submitted. Five hundred and twelve (512) fire extinguishers were inspected and serviced; 28 recharged;

Fire Marshal's Monthly Activities - continued

7 installed; 6 removed, and 2 weighed. Ninety-six (96) fire hose standpipes were inspected.

Investigated fire at North Richland Restaurant and Drug Store caused by ignition of grease on commercial range in restaurant kitchen.

Investigated propane gas leak at Kaiser's Market and caused complete shut-down of system until repaired by a competent gas engineer.

Investigated gasoline spillage from a tank truck at Parcell's Texaco Service Station where over 100 gallons flowed into storm sewer. The sewer was flushed by Fire Department apparatus.

Initiated fire prevention week campaign for October 3 to 9, and promoted four Chamber of Commerce Committee Meetings, including an evening meeting of entire committee. Met with six individual chairmen to help map their plans and programs. Made arrangements with the Chamber and Local Insurance firms to order 40,000 pieces of promotional material, movie films and contest prizes.

Fire Marshal assisted in simulated disaster plotting test at Civil Defense Headquarters.

Supervised final acceptance inspection of the new sprinkler systems at Safeway Store.

Made frequent inspections of the JC's Frontier Concession row for fire and safety hazards.

Caused immediate action in correction of serious trash hazards and blocked exits in North Richland colored barracks.

Prepared a fire-safety quiz for a Commercial Real Estate Safety Meeting.

Advised Community Engineering on several occasions when private construction failed to conform with fire codes and good fire safety practice.

Surveyed American Legion building for proposed alterations and made recommendations relative to required fire protection.

In the interest of public safety, made recommendations to owners of North Richland Drug Store prior to start of public fire sale in the seriously damaged building.

Attended several meetings with AEC Safety and Engineering to discuss plans for proposed projects to improve fire protection in Hospital and Schools. Also, assisted with surveys of the various buildings.

Assisted Architect, AEC Engineering, School Officials and the Contractor in making final acceptance inspections of new fire alarm systems in four grade schools. None of the systems were accepted due to operational failures.

COMMUNITY OPERATIONS SUB-SECTION
 RICHLAND ELECTRICAL UNIT
 MONTHLY REPORT
AUGUST 1954

<u>ORGANIZATION AND PERSONNEL</u>	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	5	16
Transfers In	0	1
Transfers Out	0	1
Terminations	<u>0</u>	<u>0</u>
Total End of Month	5	16

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	<u>0</u>
Anchors set and guys installed	<u>0</u>
Street lights repaired and steel mast arms installed	<u>1</u>
Street lights relamped - Mercury Vapor	<u>3</u>
Street lights relamped - 6000L and 4000L, 1100 Area	<u>108</u>
Street lights relamped - 6000L and 4000L, 700 Area	<u>17</u>
Flood lights relamped, 1100 Area	<u>6</u>
Flood lights relamped, 700 Area	<u>0</u>
Stack lights relamped, 700 Area	<u>0</u>
Primary line footage added	<u>0</u>
Primary line footage removed	<u>0</u>
Transformer KVA added	<u>37.5</u>
Transformer KVA removed	<u>0</u>
Net transformer KVA installed	<u>37.5</u>
New services installed - residential	<u>0</u>
New services installed - commercial	<u>3</u>
Temporary services installed and removed	<u>6</u>
Scheduled outages - primary	<u>4</u>
Scheduled outages - secondary	<u>2</u>
Unscheduled outages - primary	<u>0</u>
Unscheduled outages - secondary	<u>1</u>
Standby and escort	<u>0</u>
High voltage tree trimming	<u>180</u>
Low voltage tree trimming	<u>10</u>
Services removed - residential	<u>5</u>

TRAFFIC SIGNALS

Relamping	<u>0</u>
Operational failures	<u>1</u>
Installations	<u>0</u>
Removals	<u>0</u>
Routine maintenance checks	<u>46</u>

RICHLAND ELECTRICAL UNIT

Routine check R.R. signal at Van Giesen	<u>3</u>
Total signals in operation - automatic	<u>19</u>
Total signals in operation - manual	<u>3</u>
Total signals in operation - flasher	<u>1</u>

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	<u>32</u>
Electrical motors checked and serviced - water	<u>94</u>
Electrical motors checked and serviced - sewage	<u>57</u>

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	<u>4</u>
Outside circuit checks	<u>6</u>
Inside faults repaired	<u>0</u>
Outside faults repaired	<u>1</u>
New circuits placed in operation	<u>0</u>
New boxes placed in operation	<u>0</u>

SUBSTATIONS

Main feeder and tie breaker checks - BBLS1	<u>4</u>
" " " " " " " - BBLS2	<u>4</u>
Secondary and pad located stations -	<u>24</u>
Checked jumpers, cutouts, grounds and general condition	

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Voltage and load checks	<u>4</u>
Meters tested - Customer's request	<u>7</u>
New meters shop tested	<u>4</u>
Faulty meters replaced	<u>14</u>
Damaged meters and covers	<u>5</u>
Residential read-ins	<u>273</u>
Residential read-outs	<u>246</u>
Residential disconnects	<u>1</u>
Residential reconnects	<u>1</u>
Meters resealed	<u>2</u>

Consumption and Revenue (Accrual):

	<u>No. of Meters</u>	<u>KWH</u>	<u>Revenue</u>
Residential - Schedule 1	6992	4,475,000	\$49,000.00
Commercial - Schedule 2	<u>372</u>	<u>3,000,000</u>	<u>25,000.00</u>
Total	7364	7,475,000	\$74,000.00

RICHLAND ELECTRICAL UNIT

COMMENTS

Pole replacements as follows:

Three rotted street light poles were replaced on Thompson Street between Wright and Sanford.

Replaced six rotted primary poles in rear of houses on Abbot by shelter belt, west of GW Way. Relocated on property lines.

Installed and removed voltmeters on routine load checks:

Downtown shopping area lighting transformers.

Central Fire Station - Checks were made to determine cause for low voltage indications. Trouble was located in tap changer on #4 transformer bank at BBL92, on 115 Kv System, Plant Electrical was notified that our forces had manually raised voltage taps pending permanent adjustments by them, which were promptly made. 8-13-54.

Permanent service installations were made to the following locations:

Richland Heights Baptist Church at Duportail and Thayer.

To 16 television amplifiers at various locations as requested.

Temporary service removals and installations were made at the following locations:

Removed service and meter at Richland Heights Baptist Church.

Disconnected service to old skating rink for building alterations.

Installed temporary service and meter at Parcell's service station site at Duane and Lee.

Removed service and meter to Niemann Construction shack at 900 Spengler Road. Building to be moved.

Substation maintenance checks were made to seven school vaults to insure service for the coming school year.

Traffic signal rearrangement and repair as follows:

Rearranged signal at McMurray Road and GW Way, because of new paving and widening of street.

Replaced reflector on signal at GW Way and Van Giesen which was broken by vandals.

Checked and adjusted crossing signal and railroad WigWag at Van Giesen and Bypass.

Electrical repairs to water and sewer system as follows:

Installed replacement solenoid coil to pump lubricator at "F" Well. Connected well motor to #18 well which had been down for several months for repairs to pump. Installed 480 volt metering transformers to Gowan Street Dike Pump Station to eliminate high voltage metering hazards, and permit using stocked repair parts. Repaired loose Buss connection to "E" Well control panel, tightened all other hardware and electrical connections while well was down.

RICHLAND ELECTRICAL UNIT

Cleaned and overhauled three motors to McMurray Road sewer lift station, apparently due to a faulty air compressor in control circuit flooding electrical equipment.

Street lighting repairs, other than relamping, as follows:

Changed relay to 2100 series lighting station in 3000 Area Stores yard. Changed photo cell and located loose connections to 200 station at Desert Inn. Repaired broken luminaire to mercury vapor light at Wellsian Way and Lee Boulevard, which was shot out by vandals.

Removed old poles and transferred telephone equipment as requested by work order at Williams and Winslow. Installed two spans of open wire telephone circuit, along Gay Road as requested by Telephone work order. Started work on telephone rearrangement at Abbot and GW Way as requested by Telephone work order.

Unusual Incident:

Cutout switch accidentally opened under load at 100 KVA transformer in front of Tri-City Herald Building blowing switch apart and causing service interruption to customers on that transformer for 24 minutes at 10:30 a.m. on 8-5-54. Parts of switch fell on parked car, damaging finish and denting fenders. New and larger switches were installed.

Traffic signal at GW Way and Bypass Highway sustained serious damage from high load unescorted and operated by St. John's Express Co., 400 $\frac{1}{2}$ Avenue C, Kennewick. Operator was Howard L. Harden. Accident report was filed at Police Station in Richland. Repair parts necessary to complete damaged signal are on order, and signal is now under restricted operation.

Transformer changed due to overload at Desert Inn. Three 37.5 Kva transformers serving three phase cooking loads and motors at Desert Inn were changed to three 50 Kva size when checks showed they were heating badly and 50% overloaded. Outage was arranged from 1:00 p.m. to 3:30 p.m., and lighting transformers were not affected. Larger switches were installed to the larger transformers.

Call-Outs:

Superintendent and two men to cut service to North Richland drugstore, due to fire.

Foreman only, to check defective battery operation to Central Fire Station.

Foreman only, to switch and test #200 RO station, due to photo cell failure.

Foreman and one lineman to restore manual service to 3000 Area Stores RO station for fence and area lighting, when circuit had faulty relay operation.

Foreman and one electrician to repair faulty Wig Wag operation at Van Giesen and Bypass.

Foreman to assist with flooded sewer lift station at McMurray Road.

Hold-over: Two electricians to assist with flooded sewer lift station at McMurray Road. Two hours.

Total paid monthly overtime - 16 Hours. Total paid weekly overtime - 44 Hours.

COMMUNITY OPERATIONS SUB-SECTION
ENGINEERING UNIT
MONTHLY REPORT
AUGUST 1954

<u>PERSONNEL:</u>	<u>Exempt</u>	<u>Non-Exempt</u>	<u>Total</u>
Employees Beginning of Month	7	3	10
Transfers In	0	1	1
Transfers Out	0	0	0
Terminations	0	0	0
Total End of Month	7	4	11

BUILDING PERMITS ISSUED IN AUGUST:

1. O. W. Couden - Building Addition - Stevens Drive and Knight Street
2. L. R. Heaton - New Building - 500 George Washington Way
3. L. G. Cook - Building Addition - 885 Stevens Drive
4. Parcell's Service Station - New Building - Lee Blvd. and Duane Avenue
5. 3 Sign Permits

NEW MUNICIPAL CONSTRUCTION STARTED IN AUGUST:

1. Paving of Medical Arts Service Drive
2. Guthrie Avenue Sidewalk - Gilmore to Goethals
3. Additional Parking Facilities - Kadlec Hospital
4. Irrigation System - Jefferson Playground

NEW PRIVATE CONSTRUCTION STARTED IN AUGUST:

- Parcell's Service Station - Lee and Duane
O. W. Couden - Building Addition
L. R. Heaton - Filling Station
L. G. Cook - Building Addition

ENGINEERING JOBS COMPLETED IN AUGUST:

- IR-173 - Air Conditioning Community House
IR-175 - Expansion of Riverside Park
C-16101 - Set Lot Lines (1915-1919 Harris)
C-70502 - Study, Plot Land Between Newton St. & Desert Inn
L-884 - Relocation of 8" Water Main on Duane Ave. - Lee Blvd. to Gillespie St.

ENGINEERING UNIT (Cont.)

STATUS OF ENGINEERING UNIT PROJECTS:

- CA-570 Replace Raw Water Line #5 Well to Lee Boulevard - Plans & specifications forwarded to A.E.C.
- CA-577 Improvements to Existing Streets, George Washington Way - Construction 90% complete.
- L-004 Guthrie Avenue Sidewalk - Gilmore to Goethals - Construction started 8-30-54. 10% complete.
- L-728 Installation of Fire Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Department.
- L-384 Improvements to Medical Arts Building, Service Drive - Construction started 8-30-54.
- L-734 Sewer and Water Lines to Richland Heights Baptist Church - Temporary installation made. To be completed when irrigation canal is drained.
- IR-165 Parking Facilities, Kadlec Hospital - Construction started 8-30-54. 10% complete.
- IR-167 Erosion Control & Development, FY 1953, Part I - Construction in progress. Job 60% complete.
- IR-171 Automatic Bar Screens Sewage Lift Station - To be readvertised in January, 1955. No bids received at first advertising.
- IR-174 Electricity Metering, Richland Domestic Water System - Receipt of materials 90% complete. Awaiting drop of pumping loads to start construction.
- IR-176 Comfort Station, Sewage Lift Station, Chlorination Station, Riverside Park - Design 100% complete.
- IR-182 6" Water Main, Stevens Drive, Kadlec Hospital to Central UP Church - Bids opened 8-31-54.

STATUS OF ACTIVE ENGINEERING SERVICE REQUESTS:

- I 90234 Inspection, Bauer-Day Housing - 99% complete. Minor exceptions yet to be cleared.
- I 90324 Design, Engineering, Inspection, Walks, Drives at Columbia Playfield - Construction 90% complete. Work Progressing rapidly.
- I 90594 "As Builts" General, Part II - 73% complete. Work progressing.
- I 90604 Title III Inspection, Sanitary Sewer, Swift Blvd. & Gibble Street - Construction 95% complete. Cleanup to be completed.
- I 90624 Storm Drains - George Washington Way - Construction 95% complete. Cleanup to be completed.

1203574

ENGINEERING UNIT (Cont.)

STATUS OF ENGINEERING SERVICE REQUESTS (Cont.)

- I 90634 Kadlec Hospital Grounds Improvements - Contract renegotiated. Construction in progress.
- I 90724 Extension Duane Avenue Shelterbelt - Project still under consideration.
- I 90914 Utility Lines, Legal Descriptions and Diagrams for Churches - 90% complete.
- I 90944 Erosion and Dust Control, 300 Area - Project being reviewed by A.E.C.
- I 91014 Retirement of Separate Irrigation System - Design work in progress.
- I 91024 Retirement of Irrigation Canal - Design work in progress.
- I 91044 Sketch, Review, and Legal Description, Tidewater Associated Oil Company - 50% complete.

STATUS OF WORK ORDERS

All new work requests will be shown by work order number.

- C-70524 Preparing Legal Description for Paul's Inc., for lease - 25% complete.
- C-70537 Plot GWW - Newton St. & Desert Inn Service Drive
Plot Goethals Drive - Lee - 75% complete.
- C-0547 Design, Title III Inspection, Catskill St. & Rainier Avenue - Construction 50% complete. Work progressing rapidly.
- C-70512 Automatic Laundry Co. (Penny Building) - "As Built" Plans - Deferred for other work

BUILDINGS UNDER CONSTRUCTION

NOTE: All ESRs for Plans, Specifications, and Inspections were closed as of July 1, 1954. This type of work is now indicated by job title only, the expense of which is lumped and charged against routine expense code "Plans and Specifications". Buildings on which final acceptance has not been made include:

First Baptist Church (Richmond and Raleigh Streets) - 92% complete. No progress this month.

Assembly of God Church - Construction 88% complete. Progressing very slowly.

Alteration Permits - An open active file.

Television Antennae - An open active file.

Plans, Specs., Inspections, Grace Bacon Roller Rink - Construction 98% complete. No progress this month. Open for business.

Plans, Specs., Inspections, Safeway Store - Construction 99% complete. Open for business. 1203675

ENGINEERING UNIT (Cont.)

BUILDINGS UNDER CONSTRUCTION (Cont.)

Plans, Specs., Inspections, Church of Nazarene Addition - Construction 72% complete. Progressing very slowly.

Plans, Specs., Inspections, Seattle-First National Bank Addition - 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, Richland Heights Baptist Church - Construction 90% complete. Progressing according to schedule. Now occupied.

Plans, Specs., Inspections, Richland Baptist Church, G.W.W. - Construction 95% complete. Progressing according to schedule. Now occupied.

Plans, Specs., Inspections, LG Cook Construction & Maintenance Building - Construction 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, Fleiss-Davis Addition - 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, LG Cook Building Addition - 99% complete. Final inspection to be made. Open for business.

Plans, Specs., Inspections, Christ the King Parish (Catholic) - Construction 30% complete. Work progressing rapidly.

Plans and Inspections, Rest Rooms, Desert Inn - 100% complete. Final inspection to be made.

Plans, Specs., Inspections, Central UP Church - Construction 5% complete. Work progressing normally.

Plans, Specs., Inspections, Walsh Tire Shop - 50% complete. Work progressing rapidly.

Plans, Specs., Inspections, Skyline Theater - 99% complete. Final inspection to be made.

Plans, Specs., Inspection, Parcell Service Station (Duane & Lee) - 5% complete. Work progressing rapidly.

Plans, Specs., Inspection, Gouden Drive-In (Stevens & Knight) - 45% complete. Work progressing rapidly.

Plans, Specs., Inspection Bus Depot Service Station - 25% complete. Work progressing rapidly.

COMMUNITY OPERATIONS SUB-SECTION
RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
AUGUST 1954

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Beginning of Month	3	4
New Hires	0	0
Terminations	0	1
Transfers - In	0	0
Transfers - Out	<u>1</u>	<u>0</u>
End of Month	2	3

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of August 31, 1954:-

Administration	7
Principals and Supervisors	14
Clerical	25
Teachers	0
Health Audiometer	0
Cooks	0
Bus Drivers	0
Maintenance	22
Operations	<u>45</u>
	113

CLUBS AND ORGANIZATIONS

As of August 31, 1954, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council	1
Boy Scouts	1
Campfire Girls	1
Hi-Spot Club	2
Girl Scouts	2
Justice of Peace	1
Y.W.C.A.	2
Chamber of Commerce	<u>1</u>
	11

RECREATION AND CIVIC AFFAIRS UNIT

AUGUST 1954

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business, Professional, Service & Governmental	18
Churches and Church Organizations	31
Civic Organizations	7
Schools, Alumni Groups, & P.T.A.'s	25
Fraternal Organizations	25
Political Organizations	7
Recreation and Social Clubs -	
Crafts and Hobbies	8
Dramatics	1
Dance	6
Nature and Outing	7
Music	8
Social	13
Sports	19
Veteran and Military Organizations	14
Welfare Groups	11
Youth - Boy Scouts	20
Girl Scouts	49
Campfire Girls	36
Miscellaneous	<u>16</u>
	321

RECREATION

The Atomic Frontier Days Celebration, sponsored by the Richland Junior Chamber of Commerce, was held on August 6, 7, and 8th., at Riverside Park, with approximately Twenty thousand (20,000) persons attending the affair.

On August 13, 14, and 15th., the Washington State Womens' Softball Tournament was held at the Memorial Softball Park.

The summer recreation program at Riverside Park and Columbia Playfield was concluded on Friday August. 20, 1954.

RECREATION AND CIVIC AFFAIRS UNIT

AUGUST 1954

Attendance Statistics - August, 1954

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Spectators</u>	<u>Sub-Total</u>
A. <u>Community House</u>					
I. <u>Rec. Unit Supervised Programs</u>					
Games Room Activities	26	1 810	204		2 014
Arts & Crafts Class	5	166	12		178
II. <u>Affiliated Programs</u>					
Hi-Spot Club (Teen Age)	7	2 225	29		2 254
Int'l. Folk Dancers	4	11	48		59
Jr. Sportsman Club	2	16	6		22
Rich. Rod & Gun Club	1		122		122
III. <u>Rec. Unit Special Events</u>					
None					
IV. <u>Non-Unit Special Events</u>					
A.F.D. Hobby Show	2		75	5 000	5 075
V. <u>Other Comm. House Bookings</u>					
	<u>22</u>	<u>29</u>	<u>328</u>	<u> </u>	<u>357</u>
Sub-Total	69	4 257	824	5 000	10 081
B. <u>Parks and Playgrounds</u>					
I. <u>Rec. Unit Supervised Programs</u>					
Juvenile Fishing	31	210	40		250
General Play- Riverside	31	3 319	3 072		6 391
General Play- Columbia	31	1 751	3 287		5 038
Play-Fur-Fun League	1	23	4	19	46
Triple-G-League	3		222	123	345
Dramatics	6	85	6		91
Story Telling	3	138	3		141
Tumbling	1	5	1		6
Wading Pool - Riverside	31	1 009			1 009
II. <u>Affiliated Programs</u>					
Int'l Folk Dancers	4		90		90
Lakeshore League	3		60	150	210
Little League (Jeff.)	1	30	8	1 600	1 638
Jr. Softball League	5	150	60	210	420
Rich. Softball Assn.	15		900	840	1 740

RECREATION AND CIVIC AFFAIRS UNIT

AUGUST, 1954

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Spectators</u>	<u>Sub-Total</u>
III. <u>Rec. Unit Special Events</u>					
Band Concert	1		35	500	535
Hop Scotch Tournament	1	17	1	25	43
Jump Rope Contest	1	25	2	30	57
IV. <u>Non-Unit Special Events</u>					
A.F.D. Concession Row	3		180	21 000	21 180
A.F.D. Dances	2		444	2 400	2 844
A.F.D. Parade	1		300	20 000	20 300
A.F.D. Youth Events	1	20	4		24
A.F.D. Talent Show	2		130	10 000	10 130
Womens Softball Tourn.	4		330	2 500	2 830
V. <u>Baseball and Softball Bookings</u>					
All Practice Fields	150	600	810		1 410
VI. <u>Estimated Use of Non-Supervised Playgrounds</u>					
	<u>31</u>	<u>6 100</u>	<u>550</u>		<u>6 650</u>
Sub-Totals	363	13 482	10 539	59 397	83 418

SUMMARY OF STATISTICS

Community House	69	4 257	824	5 000	10 081
Parks & Playgrounds	<u>363</u>	<u>13 482</u>	<u>10 539</u>	<u>59 397</u>	<u>83 418</u>
Total August Atten.	432	17 739	11 363	64 397	93 499
Grand Total for August		93 499			
Cal. Year Total to Date		298 502			

COMMUNITY OPERATIONS SUB-SECTION
 WATER AND SEWERAGE UTILITIES UNIT
 MONTHLY REPORT
 AUGUST 1954

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	*5	22.5
Transfers Out	-	--
Transfers In	-	-
New Employees	-	-
Terminations	-	-
Total End of Month	**6	22.5

* One shift supervisor on loan from Public Works Unit included.
 ** One shift supervisor on loan from Manufacturing included.

DOMESTIC WATER

Operations were normal during the month. Water consumption was somewhat lower than expected.

Trouble and complaints due to sand in the water were not as prevalent as during July although several complaints were received. Samples of sand from the sand traps were sent to the laboratory for analysis to determine, if possible, which traps were passing sand. Results from these samples were not too conclusive but the indication was that the sand trap on the George Washington Way feeder main was settling out only the heavier particles of sand.

Three leaks occurred on the raw water header on Wellsian Way during August.

On August 10, No. 18 well pump was reinstalled and put into service.

Approximately 140' of 4 inch fire service water line was replaced on the south side of Kadlec Hospital during the month.

Water supply to the 3000 Area percolation basin was shut off August 13 and 14 because of high turbidity in the canal water caused by flash floods in Yakima River headwaters.

Community Operations
Water and Sewerage Utilities Unit

DOMESTIC WATER

	<u>Well Production</u> <u>Million Gallons</u>	<u>Average Daily</u> <u>Production</u>	<u>Total Consumption</u> <u>Million Gallons</u>	<u>Av. Da.</u> <u>Consump.</u>
Richland	155.5800	5.0187	582.1198	18.7781
North Richland	490.1300	14.1977	87.1855	2.8124
Columbia Field	85.9503	2.7726		
300 Area			61.0025	1.9678
	731.6603	21.9890	730.3078	23.5583

Maximum daily consumption was 29,728,200 gallons on August 11, 1954.

SEWERAGE SYSTEM

On August 20 the sewage lift station on McMurray Road became flooded. This was apparently caused by a control system failure. The dry well of this station was also flooded because of faulty caulking around a control tube through the wet well wall. The control tube opening through the wall has been sealed and the control mechanism has been repaired.

The digester mixers at the sewage treatment plant were re-assembled and re-installed during the month.

SEWAGE

	<u>Total Flow</u> <u>Million Gallons</u>	<u>Average Daily Flow</u> <u>Million Gallons</u>
Plant No. 1	40.560	1.308
Plant No. 2	89.329	2.882
Total	129.889	4.190

IRRIGATION SYSTEM

Operation remained normal throughout the month.

Another experimental application of chlorine to the canal for aquatic weed control was tried during the month on the section of canal from the Penstock to the By-pass highway. This application proved very successful in stopping weed growth.

COMMUNITY OPERATIONS SUB-SECTION
 RICHLAND PUBLIC LIBRARY
 MONTHLY REPORT
 September 1954

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees - Beginning of Month	4	8
Transfers In	0	0
Transfers Out	0	0
New Hires	0	½
Terminations	0	1
End of Month	4	7½

GENERAL

Circulation

Books	21,012
Magazines	575
Pamphlets	85
Records	796
Inter-Library Loans	45
Grand Total	22,513

Current Book Stock

Books added this month	386
Books withdrawn this month	0
Grand Total	31,420
Phonograph Records added	17
Phonograph Records discarded	79

Registration

Adult	167
Juvenile	75
Total	242
Total Registered Borrowers	17,324

Children's Story Hour Attendance	137
Meetings in North Hall	19

As of August 31, one hundred and fifty-three children had completed their summer reading to become winners in the 1954 Children's Summer Reading Program. The reading must be completed by September 3 to entitle the children to their awards and to attend the Winner's Party to be held Saturday, September 11.

COMMUNITY OPERATIONS SUB-SECTION
PUBLIC WORKS UNIT
MONTHLY REPORT
AUGUST 1954

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	*4.0	53.5
Transfers Out	-	-
Transfers In	-	-
New Employees	-	-
Terminations	-	2.0
Total End of Month	*4.0	51.5

*Figure does not include one Foreman who is on loan to Water and Sewerage Utilities Unit.

Roads and Streets

Construction work on Project CA-577 "Improvement to George Washington Way", continued, and all paving was completed and opened to traffic on 8-19-54. Work remaining on this development includes grading of shoulders, some inter-section tie-ins to existing paving, and miscellaneous clean-up.

Removal of excess rock remaining from Seal-Coat program was continued and is now 95% completed.

Two catch basins and connecting pipe were installed as an inverted siphon to carry drainage water from the southwest corner of Thayer and Kuhn to the north-west corner, and eliminate standing water at this location.

Gutter line improvements were made in the 1400 block on Williams and 800 block on Benham, by re-grading to provide flow and laying black top to the new grade.

Service drives from the street to parking lots at 1108 and 1109 Long; 1123 Marshall; 206, 214, 218, 302, 316 Abert; 208, 304, 316 Armistead; 208, 218 Atkins; and 219 Craighill, were repaired or re-laid, with costs of the work inside the property line charged to Real Estate, and that on the right of way to the Streets account.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks were continued.

PARKS & PUBLIC GROUNDS

The installation of an irrigation system and planting of grass seed has been completed on Project IR-175, "Extension of Riverside Park South". The contractor is responsible for development of a stand of grass, and will lower the irrigation outlets to the ground level prior to acceptance of this work as complete.

Community Operations
Public Works Unit

Construction work is now in progress on Project IR-167, "Installation of Irrigation System, Jefferson Playground.

Termination of temporary summertime employees has been started, and personnel will be gradually decreased to the winter compliment by 9-17-54.

Routine seasonal maintenance of park buildings, equipment and grounds; shelter-belt areas; and public grounds was continued.

SANITATION

Waste removal service from all residential, commercial and industrial areas was continued according to schedule, and a total of 1375 tons of waste material was disposed of at the sanitary fill during August.

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RADIOLOGICAL SCIENCES DEPARTMENT

AUGUST 1954

Summary

Twenty-three informal, 4 Class I and one Class II radiation incidents were recorded.

The principal episode of the month involved the spread of the ruthenium particulate contamination problem to numerous off-site locations. Extensive ground surveys and testing of fruit and vegetable crops were done. Although the off-site situation cannot be categorically dismissed as without hazard, it appears that the chance of significant injury to any individual is extremely low. Nevertheless, with unfavorable publicity or by misinterpretation of the facts an adverse relations condition could easily develop.

In research and development, the emphasis continued on miscellaneous studies to define more closely the biophysical and biological characteristics of the ruthenium contaminants.

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RADIOLOGICAL SCIENCES DEPARTMENT

AUGUST 1954

Organization

The month-end force of 372 included 39 supervisors, 87 engineers and scientists, twenty-one clerical and 225 other personnel.

Number of Employees on Payroll

Beginning of month	367
End of month	372
Net increase	5

General

There were 23 informal, 4 Class I and one Class II radiation incidents. The single Class II incident was a "technical overexposure" of minor significance.

The outstanding problem of the month was the spread of the ruthenium particulate contamination to numerous off-plant locations, including the Tri-Cities, Benton City, Ringold and Mesa. No additional untoward release from the stack was noted; it is assumed that the present spread was due to secondary wind action. To scope the new problem, selected ground areas were surveyed as rapidly as possible. Fruit and vegetable crops in the environs were extensively sampled. The most active particle found off-site had a dose-rate of 700 mrad per hour. In any location where contact with people was at all likely the highest value was 200 mrad per hour. In the absence of human experimentation, it is difficult to estimate the potential biological effects of such particles with certainty. However, it appears that the risk of significant injury is in fact quite small.

Nevertheless, the existing situation cannot be said to be wholly controlled, and all economically feasible methods of correcting it should be tried. At month end, one promising method, based on soil erosion control practices was advanced.

The value of the exposure illustrator function to the plant as a whole has been clearly demonstrated during the recent major ground contamination episodes. The work of that office has recently been reorganized to give more time for forward-looking developments in this field.

Radiological Sciences Department

Closer attention to departmental cost control methods has led to substantial improvements.

The AEC Radiological Physics Fellowship program for 1953-54 was terminated. Its success was somewhat limited, primarily through the unsuitability of part of the programming at the University of Washington. Possibly, the 1954-55 program will be more effective.

Inventions

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

INVENTION

TITLE

None

None

RADIOLOGICAL ENGINEERING

Radiological engineering consultation work included studies of reactor storage basin sludge disposal, reactivation of B Plant, the proposed TRX process for U Plant, and radiological problems of concern in site selection for power reactors.

Further studies indicated that Redox and Purex dilute ammonia scrubber wastes could be released to ground in combination with other wastes without significant effect on soil adsorption of radioisotopes. The program of cribbing of first cycle supernate is approaching completion; some four million gallons were placed in ground storage rather than requiring evaporation.

Experiments were initiated to determine the order of magnitude of probability of transfer by air of ground deposited particles to clothing and skin under various working conditions.

A radiological damage estimate for a Physical Constants Testing Reactor nuclear incident was completed.

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DECLASSIFIEDRadiological Sciences DepartmentRADIOLOGICAL RECORDS AND STANDARDSRadiation Monitoring UnitGeneral Statistics

	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Special Work Permits	582	571	4,076
Routine and Special Surveys	1,253	1,622	12,669
Air Samples	1,209	1,437	11,720
Skin Contamination	19	14	141

Shutdown of the MIFT separations facility was carried out without incident.

Extensive monitoring and decontamination work resulting from the plutonium particulate ground contamination problem was required in construction, military, and certain operational facilities.

Preliminary tests, sponsored by the Field Development group, on the plant laundry washing procedures, indicating that present agents used remove up to 95% of plutonium contamination from cloth samples and up to 88% of fission product contamination. Further studies with other agents are scheduled.

Radiological StandardsRadiation Incidents

<u>Type</u>	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Informal	16	23	192
Class I	6	4	52
Class II	2	1	13

The Class II investigation involved the technical overexposure of a radiation monitor at the solvent treatment building.

The four Class I incidents included three cases of unplanned whole body exposure, two at the Redox building and one at the 105-B Reactor building, and one case of excessive batch size.

Exposure RecordsPersonnel Meters, and Records and Photometry

	<u>July</u>	<u>August</u>	<u>1954 to date</u>
Gamma Pencils read	207,398	243,348	1,801,334
Potential overexposures	12	17	96
Confirmed overexposures	0	0	0
Slow neutron pencils read	1,194	1,668	9,656
Potential overexposures	0	0	1
Confirmed overexposures	0	0	0

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Radiological Sciences DepartmentPersonnel Meters, and Records and Photometry (continued)

	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Beta-Gamma film badges processed	35,525	39,629	297,762
Potential overexposures	90	25	457
Confirmed overexposures	0	1	1
Fast neutron badges processed	524	496	3,598
Potential overexposures	1	0	5
Confirmed overexposures	1	0	1
Lost readings (all causes)	86	143	1,685

BioassayPlutonium Analyses

	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Samples assayed	659	538	5,939
Results above detection limit*	22	23	198
Resamples assayed	37	24	283
Results above detection limit*	10	8	80
Maximum d/m/sample	1.46	2.60	2.60

Detection limit was 0.05 d/m.

Fission Product Analyses

	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Samples assayed	710	681	6,500
Results above 10 c/m/sample	22	28	62

Two of the results above 10 c/m were on routine samples and resamples are in process. The other 26 results above 10 c/m were on special follow-up samples taken in connection with a radiation incident at Redox reported in June.

Uranium Analyses

Results of 296 samples processed this month are tabulated below. This brings the total number of samples processed in 1954 to 2,240.

<u>Sample Description</u>	<u>End of 4th Day Exposure</u>			<u>End of 2 Days-No Exposure</u>		
	<u>Maximum</u>	<u>Average</u>	<u>Number</u>	<u>Maximum</u>	<u>Average</u>	<u>Number</u>
	<u>/ug/liter</u>		<u>Samples</u>	<u>/ug/liter</u>		<u>Samples</u>
Metal Preparation	15.2	2.5	83	6.5	2.0	57
Technical	18.5	5.9	12	9.8	4.5	8
UO ₃ Plant	50.1	5.1	67	76.4	7.8	58
Special Incidents	4.3	1.2	7	-	-	-

Sample results above 25 ug/liter are under investigation. Some of the samples after a period of no exposure were taken on the job and were probably contaminated.

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Bioassay (continued)

<u>Tritium Analyses</u>	<u>Activity Density ($\mu\text{c}/\text{cc} \times 10^3$)</u>					<u>Total</u>	<u>1954</u>
	<u>0-5</u>	<u>5-10</u>	<u>10-35</u>	<u>35-70</u>	<u>>70</u>		<u>To Date</u>
Number of Samples	203	5	14	0	0	222	1,884

Thyroid Checks

All thyroid checks reported were below the warning level.

Hand Score Summary

There were 47,153 alpha and 53,982 beta scores reported. None of the alpha and about 0.004% of the beta scores were above the warning level. Decontamination of all reported high cases was attempted and was successful.

Calibrations

	<u>Number of Routine Calibrations</u>		
	<u>July</u>	<u>August</u>	<u>1954 to Date</u>
Fixed Instruments	91	80	585
Portable Instruments	3,110	3,402	26,285
Personnel Meters	15,834	10,659	124,978
Total	19,035	14,140	151,848

BIOPHYSICS SECTION

Control Unit

Regional Survey

The general findings are summarized in the following table:
The trend factor shows the n-fold increase (+) or decrease (-) from last month, where values of n less than 2 will not be noted

<u>Sample Type and Locations</u>	<u>Activity Type</u>	<u>Average Activity Density $\mu\text{c}/\text{cc}$</u>	<u>Trend Factor</u>
<u>Drinking Water and Related Materials</u>			
Benton City Water Co. Well	alpha	1.0×10^{-8}	-
Richland, N. Richland, Benton City Wells	alpha	$(<0.5 \text{ to } 1.0) \times 10^{-8}$	-
100 Areas	beta	$(<0.5 \text{ to } 2.2) \times 10^{-7}$	-
Pasco, Kennewick, McNary Dam	beta	$(<0.5 \text{ to } 1.8) \times 10^{-7}$	-
Backwash Solids - Pasco Filter Plant	beta	$0.4 \times 10^{-7} \mu\text{c}/\text{g}$	-
Backwash Liquids - Pasco Filter Plant	beta	$2.1 \times 10^{-7} \mu\text{c}/\text{g}$	-
Sand Filter - Pasco Filter Plant	beta	$3.2 \times 10^{-5} \mu\text{c}/\text{g}$	+3
Anthracite Filter - Pasco Filter Plant	beta	$3.2 \times 10^{-5} \mu\text{c}/\text{g}$	-

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<u>Sample Type and Locations</u>	<u>Activity Type</u>	<u>Average Activity Density</u> <u>µc/cc</u>	<u>Trend Factor</u>
<u>Other Waters and Related Materials</u>			
300 Area Wells #1, 2, 3	alpha	$< 5 \times 10^{-9}$	-
300 Area Well #4	alpha	No sample	-
Well #4 measured as uranium	U	No sample	-
Other wells on the reservation	beta	$(<0.5 \text{ to } 1.9) \times 10^{-7}$	+4
Columbia River - Hanford Ferry	beta	4.0×10^{-6}	-
Columbia River - below reactors	beta	2.5×10^{-6}	-
Columbia River - Patterson to McNary	beta	$(1.9 \text{ to } 9.2) \times 10^{-7}$	+3
Columbia River - shore mud	beta	$(0.2 \text{ to } 1.1) \times 10^{-4}$	-
Raw Water - Operating Areas	beta	$(<0.5 \text{ to } 6.1) \times 10^{-7}$	+2
Reactor Effluent Retention Basins to River	beta	12,000 to 20,000 µc/sec/reactor $(3.5 \text{ to } 4.5) \times 10^{-3}$	-
Reactor Effluent Retention Basins to River	alpha	< 0.03 µc/sec/reactor	-
I ¹³¹ in farm wastes to river	I ¹³¹	$< .5 \times 10^{-9}$	-
I ¹³¹ in Columbia River - Hanford	I ¹³¹	16 µc/day 3.1×10^{-7}	-
I ¹³¹ in Columbia River - Hanford	I ¹³¹	1.3×10^{-7}	-
<u>Atmospheric Pollution</u>			
Gross Alpha emitters	alpha	$(<0.4 \text{ to } 1.5) \times 10^{-14}$	-
Gross Dose Rate - Separations Areas	beta-gamma	0.5 to 3.5 mrad/day	-8
Gross Dose Rate - Residential Areas	beta-gamma	0.3 to 1.0 mrad/day	-
Active Particles - Separations Areas	beta	$(1.1 \text{ to } 7.3) \times 10^{-13}$	-
I ¹³¹ Separations Areas	I ¹³¹	$(<0.4 \text{ to } 6.9) \times 10^{-13}$	-
I ¹³¹ Separations Stacks	I ¹³¹	< 1.4 curies/day	+45
Ruthenium - Separations Stacks	Ru ^{103,106}	< 0.4 curie/day	-
Rare Earths-Yttrium - Separations St.	beta-gamma	~ 0.02 curie/day	-
Active Particles - Wash., Idaho, Ore., Montana	-	0.01 to 0.16 ptle/m ³	-
Active Particles - HAPO	-	0.03 to 0.35 ptle/m ³	-
Tritium (as oxides) - Reactor Stacks	T	1.1 curie/day	-
<u>Vegetation</u>			
Environs of Separations Areas	I ¹³¹	$< 3 \times 10^{-6}$	-4
Residential Areas	I ¹³¹	$< 3 \times 10^{-6}$	-
Eastern Washington and Oregon	I ¹³¹	$< 3 \times 10^{-6}$	-
Non-volatile beta emitters, Wash. and Ore.	beta	$(2.2 \text{ to } 4.7) \times 10^{-5}$	-2
Alpha Emitters - Separations Areas	alpha	2.5×10^{-7}	-
Alpha Emitters - 300 Area	alpha	5×10^{-8}	-

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Radiological Sciences Department

Regional Survey (continued)

Instrument surveys of project and outlying areas during the month showed ground contamination as far east as Mesa (32 air miles) and in the communities of Richland and Benton City. Survey of a total area of approximately 500,000 square feet in twelve different fields in the Ringold area revealed 19 particles. Particle concentrations in the Richland-Benton City areas were on the order of one particle per 3000 square feet in bare areas and one particle in 1000 square feet in vegetated areas. Dose rate of most particles as measured in the field ranged from a few mrads/hr to 700 mrads/hr; the material was determined to be similar to that ruthenium-rhodium mixture previously found. One particle with an activity of 1000-2000 d/m was observed in an air sample in Richland.

Instrument surveys of sections of highways 11-A, 4-N, 1, 4-S, and 2-N showed contamination on every highway extending from the Yakima Barricade as far east as Hanford. Highways remote from 200-W showed an average contamination of 2 particles/mile while concentrations near the 200-W area approached 30 particles per mile with dose-rates generally ranging from 5 to 600 mrads per hour. Most of the particles on the highways were fixed.

Analytical Laboratory

Routine and special analyses were carried out at the established frequencies. In future, the detailed sample load will only be reported quarterly.

Analysis of peaches grown in the Wenatchee Valley and of produce from the Ringold area showed comparable activity of gross beta particle emitters, mainly due to K^{40} ; results of radiochemical analyses for ruthenium on the skins were below the detection limit of 5×10^{-6} μ c per fruit. Radiochemical analysis of particulate contamination found in Richland and Ringold areas revealed the material to be ruthenium-rhodium mixture.

Control Services

Nomogram computational charts were prepared for use in the determination of river velocities and in the determination of true dosages received from small radioactive sources. Statistical analysis of measurements of the activity of gross beta particle emitters in the Columbia River immediately behind McNary Dam revealed that concentrations in the center of the river were generally higher than those found near the shore.

Synoptic Meteorology

<u>Type of Forecast</u>	<u>Number Made</u>	<u>Percent Reliability</u>
8 hour production	62	85.2
24 hour general	93	85.2
Special	75	78.8

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Radiological Sciences Department

Temperatures continued below normal through August. The average temperature 71.4° was the fourth lowest for August in 43 years of records of this area.

Total precipitation, 0.42", exceeded the normal by 0.22". Thunderstorm showers on August 15, 19, and 20 accounted for 0.41" of the precipitation.

Experimental Meteorology

Work on the 200-mile trajectory study continued, with indications that complete knowledge of the Pacific Northwest weather situation at the time of a release would be needed. The detailed study of local plume behavior continued.

A major contribution to the particle problem will probably develop from the experimental application of contour and strip plowing to modify wind pick-up and trap airborne particles. To date, this is the only economically feasible method of decontamination that has been proposed.

Earth Sciences

Field results included determinations of cesium penetration from 216-S and 241-T cribs and tests for westward motion from the 241-T site which is near the crest of the ground water mound. Velocity tests between the 100 Areas and Gable Mountain indicated a highly permeable east-west channel.

In the laboratory, strontium, adsorbed on soil, was rather readily removed by competing cations, with removal also a function of the available anions and of pH. Plutonium in oxalic acid solution was shown to exist as an anion complex, making such wastes less favorable for ground disposal.

Industrial Hygiene

The study of the characteristics of filter-type respirators and masks continued, using the head model and human subjects.

Initial tests were made to demonstrate by electron microscopy the improvement realized by an oscillating attachment to an electrostatic precipitator air sampler. The device permits samples of aerosols to be collected directly on electron microscope screens for particle size determinations.

Data from the study of industrial noise at HAPO were further reviewed with Industrial Medical to classify the attendant hazards and to determine the type of protection needed.

Additional particles obtained from ground surfaces around HAPO were studied microscopically to determine particle sizes and character.

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Radiological Sciences Department

Methods

Gamma-ray energy scans of the Fe^{55} spectrum made with the new proportional gamma-ray spectrometer indicated that the Fe^{55} x-ray component can be measured with a resolution of 20-30%. The technique will contribute to the study of the composition of reactor effluent water.

In the study of the feasibility of replacing mica-window counters, preliminary tests on end-window proportional counting tubes indicated considerable drifting of counting rate; this was eliminated by modified window design.

Dissolution rate studies of UO_3 were made in both distilled water and synthetic pleural fluid; initial solution rates are the same but the oxide reached maximum solubility more rapidly in the synthetic solution.

Ultrafilter membranes of pore size less than 100 Å, were used for a rapid separation of ionic Pu and particulate $Pu(OH)_4$ in solubility studies.

Tests with critical orifices have shown that they can be used successfully to control the flow in stack gas monitors at pressures in the range of interest. The linear relation of orifice size to flow rate was demonstrated, thus the orifice size required for a desired flow rate can be quantitatively estimated.

A novel solution container improved the signal of scintillation equipment by fifty percent.

Various preservatives were tried on fresh urine in an attempt to retain that property which allows the separability of Pu by ultra-filtration; formaldehyde was found to be suitable.

Physics

Interchangeable target components were designed and built for the positive ion accelerator.

The reproducibility of temperature measurements with type 51A1 thermistors was determined to be better than $0.004^\circ C$ which is sufficient for calorimetric measurements of radiation.

The neutron activation technique for the measurement of the gamma ray dose to heavily blackened sensitive film (Dupont 502) used in the Hanford Badge was tried to see if the useful range of the film could be extended to higher doses. The film shows saturation and reversal effects, however, and no extension of the useful range is possible.

1203596

Radiological Sciences DepartmentInstrument Development

Scintillation counting equipment for detecting particulate contamination on the ground was assembled for surveying suspect areas from a moving vehicle. It monitored a strip about $7\frac{1}{2}$ feet wide and was capable of detecting a 5 mrad/hr particle when the travel rate was between 1 and 2 mph.

The ruthenium counter for monitoring uptake of the isotope by mice was completed for Biology.

Extensive tests of the recording anemometer for the Portable Mast showed that zero drift was negligible in 12 hours and that readings were reproduced to within 0.5% after the equipment was shut down for extended periods and then reactivated.

Tests of the new electrometer circuit for certain radiation survey instruments indicated that approaching failure of the principal battery is shown by either sensitivity change or impossibility to zero. The objective is to provide a circuit whose performance changes indicate battery condition thus eliminating the need for separate battery tests.

The experimental model of an automatic monitor for separating acceptable perforated dummy slugs from those with excessive radioactivity was operated successfully.

BIOLOGYAquatic BiologyBiological Chains

About 50% of the P^{32} ingested by mature guppies was deposited in their tissues. In young salmon, about 70% was so deposited. The mature guppies also appeared to eliminate some of the deposited P^{32} , which was not observed in the rapidly-growing young salmon.

Absorption of Tritium by Aquatic Organisms

Tritium oxide is eliminated rapidly from the body water of juvenile salmon. Over 80% is lost within one hour and over 99% within eight hours.

Highlights of the Columbia River Survey

Activity densities of river organisms increased substantially which is usual with diminishing river flow and increasing temperatures. Whitefish caught near Priest Rapids were only slightly contaminated.

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Radiological Sciences Department

Selected values of interest were:

<u>Organism</u>	<u>Location</u>	<u>Sample Type</u>	<u>Activity Density</u> (<u>μc/g</u>)	
			<u>July</u>	<u>August</u>
Minnows (Shiners)	Hanford	Ave.	8×10^{-4}	4×10^{-3}
Minnows (Shiners)	Below 100-H	Ave.	9×10^{-3}	9×10^{-3}
Whitefish flesh	Hanford	Ave.	No sample	3×10^{-5}
Whitefish flesh	Hanford	Max.	No sample	2×10^{-4}
Plankton	Hanford	Ave.	2×10^{-3}	5×10^{-3}
Midge Larvae	McNary Reservoir	Ave.	3×10^{-5}	(3×10^{-4})

(Samples partially decomposed)

Effluent Monitoring

Survival of juvenile chinook salmon in effluent concentrations as high as 10% was exceptionally good in spite of summer temperatures and retention of the fish beyond their normal migration time. Fingerlings from locally spawning salmon were clearly more tolerant of the effluent than offspring of Puget Sound strain salmon.

Biology Control Unit

Biological Monitoring

Rodent thyroid activity densities continued to decrease, with a mean activity density of 3×10^{-5} μc/g. Fission product contamination of rabbit feces was 1.4×10^{-5} μc/g.

Clinical Laboratory, Radiochemistry, and Microscopy

There was a 50% increase in clinical laboratory services preparatory to the large animal whole body irradiation studies. A procedure was developed for assessing erythrocyte fragility in graded concentrations of saline, to be used on the blood from X-irradiated sheep.

Experimental Animal Farm

Toxicology of I¹³¹

Metabolism of sheep fed I¹³¹ as evidenced by thyroid radioiodine content was higher than last month but comparable with last year's results. The ewes in the group fed 5 μc/day since 1951 failed to exhibit the marked depression in thyroid metabolism noted over one year ago in the 1950 offspring on the same feeding level.

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Radiological Sciences Department

Irradiation of Pig Skin with Radioactive Particles

Definite tissue destruction is still obvious in only two of the original seven areas of pig skin irradiated 10 weeks previously. These two areas, irradiated to about one million rads surface dose, show a large thick scab which on removal reveals a depression covered with a hairless thickened skin.

Metabolism

Fission Product Absorption and Metabolism

Emphasis was placed on ruthenium problems. Preliminary results included measurements of (1) uptake from the G.I. tract as a function of pH, (2) the fate of intraperitoneally injected material and (3) the transmission of acidic ruthenium salt solutions through the skin. Chronic experiments to establish equilibrium deposition in various tissues were also started.

Tritium Absorption and Metabolism

All tissues from rats chronically fed tritium oxide showed components with biological half-lives in the range of 70 to 320 days. These long-lived components were most prominent in bone, fat, pelt, muscle, and brain.

Experiments were started to study the distribution and retention of tritium in the developing embryonated chicken egg.

Pharmacology and Experimental Therapeutics

Work on potential ruthenium hazards was amplified. Ruthenium dioxide particles introduced intravenously were scavenged and lodged in the lung lining. Direct lung exposures were also started.

Plant Nutrition and Microbiology

The percent of I^{131} removed from soil by plants increased ten-fold as the total iodine content of the soil increased.

Yield of grain from plots irrigated with 100% reactor effluent was lower,

[REDACTED]

FINANCIAL DEPARTMENT MONTHLY REPORT
AUGUST, 1954

Final schedules required for the July revision of the Budget for FY 1956 and Revision of Budget for FY 1955 were transmitted to the Hanford Operations Office of the Atomic Energy Commission on August 16. It is expected that a Financial Plan for FY 1955 based on the above revision will be issued the latter part of September.

HOO-AEC advised on August 10 that \$100,000 was being requested for Research and Development work related to the possible new separations plant. If approved, these additional funds will increase the 2000 Program level for FY 1955 to \$8,750,000. For budget purposes, the additional funds were allocated to the Design Section.

AEC also advised on August 11 that construction equipment to be held for possible future use would not be fully depreciated; however, the Commission would bear any loss resulting from the final disposition of this equipment. A work order (\$5,000) to provide funds for an initial survey as to future equipment needs proposed by General Electric was received from AEC during the month.

Revised cost report forms designed by the General Cost Unit for use in reporting operating costs were used for the first time in reporting July costs. The revised forms briefly summarize total costs and cost distribution on the first few lines, with additional detailed information being furnished in the balance of the form. It is felt that this type of report is particularly well adapted for use by various levels of management.

A report entitled "Annual Survey of Manufactures Establishment" for the calendar year 1953 was completed at the request of HOO for the U. S. Department of Commerce, Bureau of the Census, and was transmitted to the Commission August 19 as document HW-32797. The report included information regarding salaries, number of employees, materials used, inventory levels, capital expenditures, water consumption and dollar value of products shipped during 1953.

In cooperation with the Administrator of Kadlec Hospital, an analysis and evaluation of information contained in a report prepared by the Public Administration Service on the feasibility of operation of Kadlec Hospital by the community was completed. A hypothetical budget was prepared to show the estimated cost of operating the hospital after transfer to a private entity. The Financial Department's report included an evaluation of the method of depreciation, as well as recommended rates, and also embodied considerable additional data and statistical information. The report was prepared for the Manager of the Health and

Safety Section, who transmitted it, along with his own comments on the PAS survey, to the General Manager on August 20.

The annual physical inventory of Reactor and Other Special Materials (platinum, gold, silver, etc.) was taken as of August 25 and on August 30 a physical inventory was taken of General Supplies and Spare Parts for which the Community Operations Section is responsible. Reports covering the results of these inventories are expected to be issued during September.

Landlord reports for the Community Section and the Plant Auxiliary Operations Department were verified as to acquisition costs and net book values and were returned to the respective departments for issuance.

Authority has been obtained from HOO-AEC to discontinue Memo Employee Sales, effective September 1. A new Organization and Policy Guide on the issue and control of protective clothing and equipment is being issued.

A survey has been conducted of the plant areas in cooperation with the landlords concerned and steps taken to clean up miscellaneous unused property scattered about.

Project proposals and informal requests approved by Department Managers and the General Manager for transmission to the AEC during the month amounted to \$1,647,500.

Appropriation requests processed during August amounted to \$121,130.

Successful negotiations with the Oak Ridge National Laboratory resulted in the shipment of an additional 955 grams of Pu from the inactive status inventory, bringing the total for July and August to an equivalent \$635,000 reduction in inventory and materially reducing the inventory of reduction crucibles on hand.

The current accounting controls covering Metal Preparation Section indicate satisfactory performance. For the first time we have achieved a control under which the monthly accumulation of the Factor Weight Difference account is so small that for practical considerations, factor weight and actual metal weight are synonymous. The major problem in the maintenance of this control status is in the adaption to basic process revisions.

Beginning in July for monthly-paid employees and on August 27 for weekly-paid employees, only one check per bank per payroll is being issued for the deposit of employees' salaries. This results in a

reduction of almost 9000 in the number of checks issued each month, with accompanying reduction in time required for reconciling bank accounts.

Procedures were established for the collection of tuition in the School of Nuclear Engineering by payroll deductions authorized by employees.

Detailed reports for the Financial Department appear on succeeding pages, as follows:

Summary of Cash Disbursements, Receipts and Advances	I - 4
Audits and Procedures Section Report	I - 5 through I - 6
Cost and Budgets Section Report	I - 7 through I - 10
General and Personnel Accounting Section Report	I - 11 through I - 17
Property Accounting Section Report	I - 18 through I - 24
SF Accountability Section Report	I - 25
Personnel and Organization Statistics	I - 26 through I - 27

SUMMARY OF CASH DISBURSEMENTS,
RECEIPTS AND ADVANCES

A summary of cash disbursements and receipts (excluding advances of \$6,425,000 and \$6,150,000, respectively, by the Atomic Energy Commission) for the months of August and July, 1954, is shown below:

<u>Disbursements</u>	<u>August</u>	<u>July</u>
Payrolls (net)	\$2 822 596	\$3 343 630
Materials and Freight	1 470 351	1 740 849
Payroll Taxes	730 415	937 450
Payments to Subcontractors	426 870	589 021
Group Insurance Premium	135 271	134 605
United States Savings Bonds	123 862	220 314
Pension Plan - Employees' Portion	117 872	124 272
Travel Advances to Employees	56 596	71 596
All Other	119 236	125 892
Total	<u>6 003 069</u>	<u>7 287 629</u>
<u>Receipts</u>		
Rent	125 836	122 331
Hospital	62 842	53 675
Electricity	52 656	59 377
Telephone	49 036	52 175
Refund of Travel Advances to Employees	14 078	9 677
Sundry Accounts Receivable	11 494	15 849
Bus Fares	7 755	7 266
Sales to AEC Cost-type Contractors	6 257	6 920
Refunds from Vendors	4 819	7 968
Other	4 902	4 871
Total	<u>339 675</u>	<u>340 109</u>
Net Disbursements	<u>\$5 663 394</u>	<u>\$6 947 520</u>

Outstanding advances as of August 31 and July 31, 1954 were as follows:

	<u>August</u>	<u>July</u>
Cash in Bank - Contract Accounts	\$2 856 157	\$2 094 551
Cash in Bank - Salary Accounts	<u>50 000</u>	<u>50 000</u>
Total	<u>\$2 906 157</u>	<u>\$2 144 551</u>

AUDITS AND PROCEDURES SECTION
MONTHLY REPORT--AUGUST, 1954

Internal Audit

Reports were issued for the following:

Financial Activities of the Graduate School of Nuclear Engineering
Medical Aid, Industrial Insurance and Pension Awards
Telegram Usage
Summary of Economy Achievement Proposals during FY 1954
Review of Physical Inventory at Warehouse No. 1, White Bluffs, in
connection with transfer from Kaiser Engineers to Minor Construction
Compliance with Fair Labor Standards Act (for Legal Department)

Reports were in the process of being prepared for the following audits:

Material and Package Passes
Control of Safety Awards and Employee Attendance and Service
Recognition Pins

Field work continued on audits of the following:

Printing and Reproduction Services
Telephone Usage

During the month, the following new audits were started and field work on them continued through the end of the month.

Mail Distribution
Procurement and Maintenance of Office Equipment
Fabrication Work in Progress
Proposed transfer of 115 KV Transmission Line and Substations to
Bonneville Power Administration
Review of Inventory of Surplus Materials at Crane Co.

Follow-ups were made to determine extent of compliance with recommendations made as the result of the following audits:

Accounts Receivable - Telephone
Accounts Receivable - Safety Shoes, A.E.C. cost type contractors, etc.
G. E. Employee Purchase Plan
Cash Fund
Deposits

Accounting Procedures

During August two business graduates, both having degrees from Brigham Young University (one of whom had just returned from military service, having had three weeks' employment with General Electric in 1952), were added to the Financial Department's rotational training program. One trainee who arrived in June but was granted a leave of absence the following month to attend an ROTC summer camp, returned and resumed rotational training. One man finished his rotational work and was permanently assigned to the Plant Accounting Unit, leaving seven trainees in the program.

Discussions were held with representatives of the Accounts Payable Unit to ascertain the feasibility of continuing the present study of the operation. It was agreed that realistic savings are indicated and the study should be continued.

Reviews of the applications to be made of a cash register and a Flexowriter were completed and submitted to the managers of the respective sections involved.

An analysis of the maintenance charges for payroll time recorders was instituted to determine whether or not IBM service might be utilized to advantage in maintaining the time clocks.

A full-page spread entitled "Hanford's Finance Department Is Busy Place" appeared in the August 2 issue of the Columbia Basin News. The article was illustrated with 11 pictures which the Accounting Procedures group had assisted the G. E. News Bureau in lining up in June.

Administrative Practices

Organization and Policy Guides reflecting nomenclature and appointments for the HAPO organization as of July 1, a part of which were finished in July, were completed and distributed in August. About 200 functions and responsibilities guides are yet to be distributed, most of which are for Manufacturing Department components. About 70 of these guides were in the print shop at the end of the month.

Four O.P.G.'s in the O4 series ("Project and Property Management") involving the concurrence of the Manufacturing, Engineering and Financial Departments, and HAPO's Counsel, are in the conference stage and it is anticipated that recommendations will be ready for the General Manager in the near future. These are:

- O4.1.1--Performance of Architect-Engineer-Management Services and Project Management
- O4.1.2--Management of Maintenance Work
- O4.1.3--Research and Development
- O4.3--The Use of Plant Force Laborers and Mechanics

Seven AEC transmittals were received in August, none of which required action by the General Electric Company.

Reimbursement Accounting

A third reimbursement auditor was added to this group in August, along with a stenographer to serve the Reimbursement Accounting and the Accounting Procedures groups.

Six letter approvals were received from the AEC during the month. Considerable assistance was given to other departments in working out reimbursement problems which did not require formal Commission approval.

A review of issuances in connection with the AEC Manual, which replaced the GM Bulletin system, was made in August, as well as reviews of Parts I and III of the AEC Controller's Manuals. Another project which was almost completed was the revision of Financial Department authorizations, required because of organization changes in the last few months.

COST AND BUDGETS SECTION
MONTHLY REPORT - AUGUST, 1954

Consolidations and Budgets Unit

The annual bogey of Production Costs for FY 1955 was issued early in August summarizing total and unit costs estimates for the coming year segregated by element and by process. This was reviewed during the month with the General Manager and the Manager - Manufacturing.

A comparative analysis of various budget estimates for FY 1954 with actual costs for the same period for all phases of the operation (except Construction Projects) was completed and distributed on August 27, 1954. A comparison of all budget estimates for FY 1955 made to date was also issued during August.

The first Consolidated Cost Report for Hanford Atomic Products Operation was completed during the month covering July costs. It is expected that this report will supply basic information for measurements work and materially assist in future budget preparation.

Liaison with Operations Analysis was continued to insure the installation of the revised Work Order Procedure on November 1, 1954. This is contingent upon the transfer of Classified Files to IBM being in normal operation by October 1, 1954.

Engineering Cost Unit

Considerable additional work is anticipated in connection with the new responsibilities recently assigned to Minor Construction, the more important of which are discussed below.

Minor Construction is obtaining approximately 543 units of Major Construction Equipment for Project CG-558, Reactor Plant Modification for Increased Production and other work. This equipment, physical movement of which started on August 16, 1954, will remain in pool status and without charge to current construction work until required on future work. Minor Construction is being assigned the responsibility for major overhaul of all equipment in their possession, and reserves created for this purpose and presently retained by AEC and their CFFF Contractor are to be transferred to Minor Construction to meet their anticipated needs. Accounting for major overhaul and the reserves created for this purpose is to be a General Electric responsibility effective September 1, 1954.

Due to the pending completion of 100-K Reactors by Kaiser Engineers and the resultant closing of their construction material stores, Minor Construction was required to establish their own stores inventory. Accomplishment of this was initiated on August 10, 1954 with the transfer of certain miscellaneous stores material in Warehouse No. 1 at White Bluffs from Kaiser Engineers to Minor Construction. In this connection, the procedures for taking the inventory, verifying the accuracy of the count, pricing the inventory and recording the quantities and prices on Minor Construction records were reviewed by representatives from Internal Audit and Engineering Cost. Forecasts prepared by Minor

Construction as to the operating cost and material disbursements indicate that a factor of 25% added to the value of the material disbursed will be required to liquidate operating costs. Inventory balance, as forecasted by Minor Construction, approximates \$225,000, which should, after a start-up period, produce an annual turnover rate of about two times per year. These inventories will be carried as a part of Construction Work in Progress - Engineering.

* * * * *

As a result of AEC-Washington instructions with respect to segregation of excess generated by construction programs, sub-accounts under Construction Work in Progress - Engineering have been established to record value and reserve both for excess construction materials and for excess construction equipment.

Proposed summary and detail reports of costs on Project CG-558, Pile Modifications, were prepared and forwarded to Minor Projects for review with the Atomic Energy Commission in order to establish agreement as to format, content and frequency of such reports.

A new report, "Cost and Commitments," was issued for July as a result of establishing a commitment procedure for Costs Current Fiscal Year effective with the beginning of the new fiscal year. This report shows the outstanding commitments at the end of each month for purchase orders and work orders by organization and end function. Details supporting the commitments, such as purchase order numbers and work order numbers and the amount of each, are on file and are available for analyses should operating personnel desire additional detailed information. The report will be especially valuable in determining the funds required to satisfy outstanding commitments for Research and Development or Process Technology at any time during the fiscal year. This information is being made available to both the Design and Technical Sections.

An employee of Technical Cost was given a \$75.00 Suggestion Award as a result of his suggestion regarding "Centsless Accounting." This is the second award this employee has received within two months. The first award of \$30.00 was for Cost Control of Technical Shops Work Orders.

General Cost Unit

Community Cost sub-unit completed work in connection with the preparation of the landlord report for the Richland Community Area as provided by OPG 04.5, Assignment of Landlord Responsibilities. This issue of the report was modified considerably and the number of pages, as a result, was reduced by approximately 50%.

A written procedure covering routines as regards the accounting treatment for work orders originating within the Plant Auxiliary Operations Department was under way in August, in compliance with an accepted recommendation made by Internal Audit Unit at the time of their recent review of this function.

Breakdown of operating budgets of organizations served by this Unit was made and forwarded to respective Section managers. Also, necessary cost code revisions and budget reallocations were completed, due to continuing organization changes.

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A system of "centsless" accounting was inaugurated this month in connection with Health and Safety Section cost accounting.

Manufacturing Cost Unit

The July Manufacturing Department Operating Report was revised to correspond with the new Manufacturing organizational structure. This resulted in fourteen pages being added to the report, raising the total pages to ninety.

The monthly physical inventory of Essential materials located in the 300 Area was witnessed by a member of the Essential Materials group, and Manufacturing Cost representatives located in the 100 Areas observed the 100-B and 100-C Essential Material inventories. It was recommended in a report on the 100 Area inventories that corrective action be taken on storage location of two items. Assistance was given the Inventory Accounting Unit in the inventory of Special Materials and six employees were loaned to this unit for two days during the month.

In an attempt to analyze the work load of personnel assigned to cost checking source data, a work sheet was prepared to accumulate basic information on the number of purchase orders, work orders, time cards, accounts payable vouchers, store orders, purchase requisitions and other items which provide the basic information in the accumulation, reporting and control of manufacturing cost. It was found that in the period of August 2 through August 29 there were over 31,000 items of this type processed by the cost unit.

In the Metal Preparation Section a revised method for reporting cost within the Section was adopted. This new method, which permits active participation down to first-line supervision, is designed to create greater interest in cost and the control of cost elements which will result in an improved cost reduction program. Four information meetings covering the Section's cost code structure and accounting procedures were held with Section supervision. Work was begun on the establishment of standards for measuring the performance of the Power and Maintenance and the Process Sub-Section. To obtain a tight control of funds budgeted for Equipment Not Included in Construction Projects, a procedure was adopted whereby all purchase requisitions and work orders coded to investment will be channeled through a central location for logging the pertinent information and obtaining approval signatures.

In the Reactor Section a new Maintenance Cost Report was developed and issued for the first time in August covering maintenance cost for July. This cost report furnishes both the Maintenance Sub-Section and their major customers (Power, Operations and Radiation Monitoring) a breakdown of cost by work description. This was made possible through the use of Expense Accounts established for the Reactor Section in July. There have been many favorable comments concerning this report, and it is apparent that it will be an effective tool for maintenance cost control.

"Separations Section Essential Material Codes" Document HW-32730 was revised and reissued, and the Separations Section work order authorization list was revised to conform with the recent reorganization. Work was started on revising the complete work authorization list for HAPO.

A comparison of Work in Process Inventory at March 31, 1954 and June 30, 1954 was made during August, with explanations given for price and quantity changes. Results of this comparison were issued in Document HW-32682. In addition, a chart was prepared illustrating work in process inventory balances at June 30, 1952 and 1953; by months for fiscal year ended June 30, 1954, and estimates at June 30, 1955 and 1956, and explanations of increases and decreases during these periods were given.

Considerable progress was made in preparing the revised Work Order Procedure for the Manufacturing Department, with the following completed and issued:

Part A outlines the preparation of the work order form and the use of the supplemental work order form, as well as distribution, routine work orders, and work order overruns.

Part B covers the expense code system for the Manufacturing Department.

Part C includes the purpose and use of the Miscellaneous Applied Material account.

Other phases of the Work Order Procedure are currently in the process of preparation.

GENERAL AND PERSONNEL ACCOUNTING SECTION
MONTHLY REPORT - AUGUST, 1954

NARRATIVE REPORT

General Books Unit

The following changes in ledger accounts were made effective in August:

Sub-accounts of Construction Work in Progress established:

- Excess Construction Materials and Equipment - Kaiser
- Excess Construction Materials and Equipment Reserve - Kaiser
- Excess Construction Materials and Equipment - Blaw-Knox
- Excess Construction Materials and Equipment Reserve - Blaw-Knox

The above sub-accounts were established for the purpose of recording excess construction equipment and materials transferred from Kaiser and Blaw-Knox to General Electric for sale at public auction. After sale the balance in these accounts, representing gain or loss from the sale, will be transferred to the respective contractor.

Sub-account of Spare Equipment Held in Storage established:

Spare Equipment Withdrawn for Modification.

The cost of spare equipment undergoing modification as of August 31, 1954 (\$59 460) was transferred from Fabrication Work in Progress to this new sub-account.

The accumulated overliquidation as of August 31, 1954 of Engineering Department costs applicable to construction (\$560 441) was transferred from Deferred Charges to Construction Work in Progress; such over or underliquidations will be included in Construction Work in Progress at the month-end hereafter.

Effective with the report for July, 1954, the report "Government Cost Transfers" was revised to show the general ledger accounts affected by transfers from and to AEC.

Summary data with respect to employees' travel, living and conference expenses are included in the Statistics portion of this report. An analysis of the expense accounts of employees who attended conferences at Association Island in July, for the purpose of determining the portion of these expenses which are chargeable to AEC, will be completed in September. During August \$606 was received from three off-site inspectors, representing downward adjustments of travel and living expenses previously reported by these inspectors.

Accounts Payable Unit

Financial control of the Returnable Containers account was transferred as of September 1, 1954 from Accounts Payable Unit to Stores Unit. As a result of this

transfer a duplication of record keeping with respect to returnable containers was eliminated.

Data with respect to volume of work handled are shown in the Statistics portion of this report. August volume exceeded that of July, and exceeded the average for the twelve preceding months.

Accounts Receivable Unit

Gross accounts receivable balances decreased \$8,597 during the month. Details of the decreases and increases are summarized below:

Decreases:	
Kadlec Hospital	\$ 9 653
Sundry	= 294
Safety Shoes	2 191
Others	349
Total decreases	<u>17 487</u>
Increases:	
Electricity	3 465
Telephone	3 438
Rent	1 487
Others	500
Total increases	<u>8 890</u>
Net decrease	<u>\$ 8 597</u>

Arrangements were completed in August for discontinuance of the Memo Employee Sales procedure, effective September 1, 1954. The procedure being discontinued provided that a central record was maintained by Accounts Receivable of certain items (safety glasses, padlocks, rainsuits, British leggings, overshoes, raincoats, rain hats, flashlights, etc.) withdrawn from and returned to Stores by employees, and the cost of items not returned was collected from terminating employees. In the future the employing departments will maintain records of this equipment issued to employees, and the Financial Department will request payment from employees for items not accounted for only if requested to do so by the employing department. The records, previously maintained by Accounts Receivable, will be forwarded to the employing units about September 10, 1954.

Personnel Accounting Unit

A selective analysis of exempt positions, to provide Salary Survey data for Los Alamos Scientific Laboratory, was completed during the month in conjunction with Salary and Wage Administration. The analysis was forwarded to the Accounting Services Division, Schenectady.

Retroactive salary adjustments totaling \$448 were paid to 25 nonexempt firemen in the 300 area for overtime for time going between the 300 L clock house and the fire station from the week ended June 13, 1954 through the week ended August 8, 1954. This retroactive payment was included with current pay for such overtime in checks distributed on August 27.

One annuity certificate was issued to a former duPont employee during August, bringing the total of certificates issued to 99.

The procedure for sending individual deposit slips for deposited salaries to the banks accompanied by one check for the total amount of money being deposited was placed in effect with the weekly payroll distributed August 27.

Procedures were established for the collection by Payroll deductions, authorized by employees, of tuition in the School of Nuclear Engineering.

Reimbursement Authorization No. 231, covering changes in the union agreements applicable to all nonexempt employees except Two-Platoon Firemen, was received.

Office Letter No. 200, issued August 30, 1954, on the subject "Labor Day Holiday," covered instructions on the time card schedule for the week ending September 12 and weekly salary check distribution during that week.

Employee communication meetings were held with all employees in the unit.

STATISTICS

General Books Unit

	<u>August</u>	<u>July</u>
<u>Advances from AEC</u>		
Balance at beginning of month	\$2 144 551	\$2 942 071
Advances received from AEC	6 425 000	6 150 000
Other cash receipts	339 675	340 109
	8 909 226	9 432 180
Less disbursements	6 003 069	7 287 629
Balance at end of month	\$2 906 157	\$2 144 551
Advances requested for subsequent month	\$6 250 000	\$6 425 000
<u>Travel Advances to Employees</u>		
Balance at beginning of month	\$ 85 789	\$ 62 428
Advanced to employees	57 422	71 596
	143 211	134 024
Less:		
Travel, living and conference expenses reported by employees	62 671	38 558
Cash refunded by employees	14 078	9 677
	76 749	48 235
Balance at end of month	\$ 66 462	\$ 85 789
<u>Outstanding Travel Advances to Employees</u>		
Current	\$ 58 734	\$ 76 388
Outstanding over 30 days	7 728	9 401
Total	\$ 66 462	\$ 85 789

General Books Unit (Continued)

	<u>August</u>	<u>July</u>
<u>Employees' Travel, Living and Conference Expenses</u>		
Reported by employees, etc:		
Travel and living expenses		
Off-Site inspectors	\$19 501	\$16 450
Others	41 467	21 863
	<u>60 968</u>	<u>38 313</u>
Conference expenses	1 703	245
Total	<u>62 671</u>	<u>38 558</u>
Less:		
Expenses for trips which included attendance at Association Island conferences, temporarily transferred to Undistributed Costs	16 542	7 018
Expenses charged to other G.E. components or carriers	2 602	401
Living expenses in excess of \$9 per diem	(183)	212
Conference expenses	<u>1 703</u>	<u>245</u>
	<u>20 664</u>	<u>7 876</u>
Amounts determined to be payable by AEC	<u>\$42 007</u>	<u>\$30 682</u>
Number of expense reports submitted by employees	<u>276</u>	<u>198</u>

Accounts Payable Unit

	<u>August</u>	<u>July</u>
<u>Accounts Payable</u>		
Balance at beginning of month	\$ 728 227	\$1 171 630
Vouchers entered	2 977 366	3 336 660
Accrual for inventories	35 528	125 675
Cash receipts	4 819	7 968
	<u>3 745 940</u>	<u>4 641 933</u>
Less:		
Vouchers paid	3 056 611	3 723 684
Reversal of accruals	125 675	190 022
	<u>3 182 286</u>	<u>3 913 706</u>
Balance at end of month	<u>\$ 563 654</u>	<u>\$ 728 227</u>

Other Statistics

Number of vouchers recorded	4 207	3 982
Number of checks issued	2 850	2 355
Number of freight bills paid	1 481	962
Amount of freight bills paid	\$288 818	\$189 296
Number of purchase orders received	2 173	2 193
Amount of purchase orders received	\$1 431 887	\$1 435 300
Amount of cash discount earned	\$4 625	\$4 262

Accounts Receivable Unit

<u>Account</u>	<u>Balance 7-31-54</u>	<u>Net Charges</u>	<u>Collections</u>	<u>Balance 8-31-54</u>	<u>Number of Bills Issued During Month</u>
Hospital:					
Active	\$103 443	\$ 59 253	\$ 68 741	\$ 93 955	1 536
Collection agencies (64 accounts)	9 734		165	9 569	
Sundry:					
Active	34 676	5 760	11 658	28 778	289
Collection agencies (142 accounts) -a)	6 519	698	94	7 123	
Rent	38 228	396 447	394 960	39 715	6 913
Electricity	33 370	56 848	53 383	36 835	4 196
Telephone	35 438	53 940	50 502	38 876	6 789
Equipment sales to facilities (1 account)	25 128		349	24 779	
Cost-type contractors	12 452	6 584	6 258	12 778	27
Safety shoes	3 539	2 829	5 020	1 348	531
Loans to employees (5 accounts)	596	200	26	770	
Sub-total	303 123	\$582 559	\$591 156	294 526	20 281
Reserve for bad debts	30 875 cr.			31 393 cr.	
Net balance	<u>\$272 248</u>			<u>\$263 133</u>	

(a- Includes all utility and rental accounts.)

Personnel Accounting Unit

<u>Number of NAPO Employees</u>	<u>Total</u>	<u>Monthly Payroll</u>	<u>Weekly Payroll</u>
<u>Changes during month</u>			
Employees on payroll at beginning of month	8 731	2 301	6 430
Additions and transfers in	132	7	125
Removals and transfers out	(92)	(22)	(70)
Transfers from weekly to monthly payroll		7	(7)
Transfers from monthly to weekly payroll		(7)	7
Employees on payroll at end of month	<u>8 771</u>	<u>2 286</u>	<u>6 485</u>
		<u>August</u>	<u>July</u>
<u>Overtime Payments During Month</u>	<u>Number</u>	<u>Amount</u>	<u>Number</u> <u>Amount</u>
Weekly-paid employees	4 956	\$77 474-a)	6 362 \$ 99 643-b)
Monthly-paid employees	302	21 613	322 25 354
Total	<u>5 258</u>	<u>\$99 087</u>	<u>6 684</u> <u>\$124 997</u>

(a- Payments to weekly paid employees are for four week periods.

(b- Payments to weekly paid employees are for five week periods.

Personnel Accounting Unit (Continued)

Number of Changes in Salary Rates and Job Classifications

	<u>August</u>	<u>July</u>
Temporary changes	201	259
Retroactive changes	11	57
Normal changes	<u>1 002</u>	<u>941</u>
Total	<u>1 214</u>	<u>1 257</u>

Gross Payroll Paid During Month

Engineering Department	\$ 790 905	\$ 849 741
Manufacturing Department	1 727 761	2 055 790
Plant Auxiliary Operations Department	808 086	985 620
Other	718 958	824 426
Total	<u>\$4 045 710-a)</u>	<u>\$4 715 577-b)</u>

(a- Payments to weekly paid employees are for four week periods.

(b- Payments to weekly paid employees are for five week periods.

Employee Benefit Plans

Participation in Benefit Plans at Month End

	<u>Number Participating</u>		<u>Percent Participation</u>	
	<u>August</u>	<u>July</u>	<u>August</u>	<u>July</u>
Pension Plan	7 979	7 960	97.8%	97.8%
Insurance Plan				
Personal coverage	8 698	8 656	99.2	99.2
Dependent coverage	6 067	6 040	-	-
U. S. Savings Bonds				
Stock Bonus Plan	4 349	4 315	49.6	49.4
Savings Plan	1 133	1 119	12.9	12.8
Both plans	4 938	4 901	56.3	56.1

Pension Plan

	<u>August</u>	<u>July</u>
Number retired	3	9
Number who became eligible for participation	64	68
Number who applied for participation	57	64
Number who elected not to participate	5	3

Insurance Plan - Number of Claim Payments

Employee life insurance	1	2
Employee accident and health insurance	496	474
Dependent accident and health insurance	<u>430</u>	<u>434</u>
Total	<u>927</u>	<u>910</u>

Suggestion Awards

Number of awards	47	138
Total amount of awards	\$2 265	\$1 990

Good Neighbor Fund

Number participating	5 896	5 858
Percent of participation	67.2%	67.0%

Personnel Accounting Unit (Continued)

	<u>August</u>	<u>July</u>
<u>Preferential Rates</u>		
Number eliminated	-	9
Number currently in effect	578	578
<u>Number of Military Allowance Payments</u>	9	2
<u>Number of Payroll Deductions - Other than Taxes</u>		
Pension	25 300-a)	30 900-a)
Savings bonds	15 359	18 545
Good Neighbor Fund	10 482	9 855
Insurance	8 769	8 727
House rent	5 093	5 055
Union dues	1 896	1 893
Safety shoes	955	1 156
Dormitory rent	563	539
Hospital	491	527
Trailer space	144	150
Barracks rent	8	10
Other	185	179
Total	<u>69 245</u>	<u>77 536</u>

(a- Approximate)

PROPERTY ACCOUNTING SECTION
MONTHLY REPORT - AUGUST 1954

Plant Accounting Unit

Reconciliation of the physical inventory of uninstalled equipment is nearing completion and will be completely reconciled during the month of September.

Landlord reports for Community, Medical and Plant Auxiliary Operations Departments were verified as to acquisition costs and net book values and were returned to the respective departments for issuance.

Work was completed on the costing of the 115-KV Transmission Line for possible disposal to the Bonneville Power Administration. A copy was transmitted to Internal Audit for verification and comment. An informal copy was also forwarded to AEC with instructions that cost data should not be considered final.

In connection with certain reorganization of various departments of HAPO, letters of verification were transmitted to section managers and acknowledgments received on appointed property control unit heads.

At the request of Hospital Accounting, evaluation was made of the depreciation phase of a study recently completed by Public Administration Services, entitled "Community Operation of Kadlec Hospital, Richland, Washington." The method of depreciation, as well as recommended rates, were reviewed and comments were forwarded to the Hospital Accounting Staff.

A General Ledger account, Construction Equipment Held for Future Use, was established. This account will include the cost of all construction equipment retained for possible future construction of HAPO facilities and will represent Shop Equipment, Graphite Fabrication Equipment, Heavy Equipment, Motor Vehicles, etc. Procedures are being established for the accounting treatment of all such equipment.

Blaw-Knox was contacted during the month relative to unitization of Purex facilities and informally agreed that unitization of this facility would be accomplished by them according to our requirements.

Graphic charts illustrating the relative position of HAPO to other utility or industrial plants were issued and covered the following general items:

1. Investment in plant (gross) at December 31, 1953.
2. Turnover of net investment at December 31, 1953.
3. Comparison of net fixed assets to net investment at December 31, 1953.
4. Gross plant and equipment per employee at December 31, 1953.

Plant Accounting Unit - continued

The following charts concern HAPO only:

1. Production per unit of gross plant investment.
2. Relative plant investment per unit of production.
3. Gross and net plant and equipment by years from June 30, 1947 through June 30, 1956, excluding assets applicable to Community and Medical facilities.

Value of plant and equipment at August 31, 1954, follows:

	(In Thousands)		
	<u>Asset</u>	<u>Reserve</u>	<u>Net</u>
Completed Plant and Equipment	\$736,641	\$283,001	\$453,640
Construction Work in Progress	34,109		34,109
Total Cost Recorded (GE Books)	<u>770,750</u>	<u>283,001</u>	<u>487,749</u>
AEC and Other Contractor Costs			
Land and Land Rights	5,476		5,476
Construction Work in Progress	<u>160,707</u>		<u>160,707</u>
Total	<u>\$936,933</u>	<u>\$283,001</u>	<u>\$653,932</u>

Certain functions and responsibilities of the Plant Accounting Sub-Units were altered during the month to provide additional clerical help in connection with unitization of projects and reconciliation of uninstalled equipment inventories. The reorganization divided inventory responsibilities for new construction to the Analysis and Unitization Sub-Unit and responsibilities for existing plant and equipment with the Plant Accountability Sub-Unit.

The transfer of one business graduate from Rotational Training increased the non-exempt personnel to 31 and exempt remained at 6, with an aggregate total of 37.

Inventory Accounting Unit

The annual physical inventory of reactor and other special materials was taken as scheduled as of August 25, 1954. Materials inventoried were in the custody of Engineering, Manufacturing, Manufacturing and Radiological Sciences Departments. Results of the physical inventory are not yet available. Preliminary review indicates that for each kind of material inventoried there will be overages. Work is still underway in reviewing custodial records and procedures and analyzing source documents to determine final amounts and reasons for differences. This review is expected to be completed and a report issued in September, 1954 covering the results of the physical inventory.

Inventory Accounting Unit - continued

On August 30, 1954, a physical inventory was taken of general supplies and spare parts for which the Community Operations Section is responsible. The general supply items, consisting of plumbing, electrical, carpentry and floor covering supplies, were stored on twenty-eight service trucks and the spare parts, all electrical supplies, were stored in the Richland Electrical System warehouse in North Richland. Reconciliation of the physical inventory is currently underway and a report of the results of this physical inventory will be issued during September 1954.

Pre-inventory meetings were held with Stores Unit personnel during the month to discuss pre-inventory work, establish cut-off dates and document control procedures relative to the physical inventory of general supplies which is scheduled for September 20, 1954 through September 22, 1954. Preparatory work is progressing according to schedule. In addition to the meetings, a survey was made jointly by Stores and Inventory Accounting representatives of each of the area stores to determine manpower requirements and to get acquainted with the type and volume of materials carried in stock.

In order to comply with the Commission's new procedure governing the accounting and reporting of construction-generated excess, we found it necessary to establish subsidiary accounts under account 0620, Construction Work in Progress, to record property transferred to our Excess and Salvage yard by the construction contractors during the period July 1 through September 10, for disposal in the auction sale which is scheduled for October 11, 1954. When the auction sale is completed these accounts are to be liquidated by transferring any remaining balances to the respective contractors, together with any property that is not sold.

A review was made of all excess material and equipment captions to determine if the caption number and descriptions were in agreement with the AEC's listing of Standard Inventory and Equipment Classifications. Except for a few minor changes in caption titles, all captions were found to be in agreement with the AEC listing. In connection with the program of standardizing all inventory captions, the following captions were established in the General Supplies Inventory Account 0420:

- Caption 27 - Floor Covering and Finished Textiles
- Caption 42 - General Hardware
- Caption 59 - Building Materials

Inventory Accounting Unit - continued

Following is a summary showing inventory account balances for the months of July and August, together with the amount of change:

	(In Thousands)		Increase (Decrease)
	Book Balance 7-31-54	8-31-54	
Current Inventories			
General Supplies	\$ 1,442	\$ 1,406	\$ (36)
Fuel and Lubricants	60	61	1
Essential Materials	3,228	3,318	90
Total Current Inventories	<u>4,730</u>	<u>4,785</u>	<u>55</u>
Special Materials	1,421	1,456	35
Spare Parts	2,738	2,649	(89)
Excess Materials	1,317	1,298	(19)
Total Inventories - Gross	<u>10,206</u>	<u>10,188</u>	<u>(18)</u>
Less: Spare Parts Inventory Reserve	(662)	(655)	(7)
Excess Inventory Reserve	(1,021)	(999)	(22)
Total Reserve	<u>(1,683)</u>	<u>(1,654)</u>	<u>(29)</u>
Total Inventories - Net	<u>\$ 8,523</u>	<u>\$ 8,534</u>	<u>\$ 11</u>
As a Memo:			
Excess Equipment	\$ 2,234	\$ 2,218	\$ (16)
Excess Equipment Reserve	(1,738)	(1,706)	(32)

Although the gross value of materials in inventory accounts decreased slightly, there were significant changes in the inventory levels of Essential Materials, Special Materials, and Spare Parts. Essential Materials went up \$90,000, primarily because of increases in metals, with some increase in other production materials. Special Materials increased \$35,000 as a result of procurement by Manufacturing of 10,000 grams of platinum discs for use in filter boats. Spare Parts decreased \$89,000, due mainly to (1) transfer to excess of \$18,000 in obsolete telephone cable parts and supplies and fluid control equipment parts; (2) adjustment to books of \$28,000 to correct previous month's billings covering the fabrication of spares; and (3) withdrawal of spares in August was \$37,000 greater than in the previous month.

Property Management Unit

As a result of the new definitions of Stand-By and Spare Parts Inventories contained in the Commission's letter of July 12, 1954, subject "Budgeting, Accounting and Reporting of Inventory Transactions," discussions have been completed by management concerned on how best to accomplish the desired objectives. It is planned to proceed as follows:

Remove at once from the spare parts inventories those items which are readily identifiable as belonging in current use inventories.

This will leave true spares as defined by the Commission and certain essential items which, from an operational standpoint, fall somewhat into a grey zone between spare parts and current use inventories. These latter items will be physically separated from the spare parts inventories and reported as current use inventories. They will, however, be left in their present locations. For the time being department managers will continue their control (by the use of Stock Adjustment Requests) over both spare parts and the essential items placed

Property Management Unit - continued

in current use inventories. As experience is gained inventories will be adjusted accordingly.

It is anticipated that six months or longer will be required to review the spare parts inventories and effect the physical separation required.

Authority has been obtained from HOC-AEC to discontinue Memo Employee Sales effective September 1, 1954.

If these items (safety glasses, padlocks, rainsuits, British leggings, overshoes, rain coats, rain hats, flashlights, etc.) are required for work in the plant they will be drawn, issued and controlled by the department concerned in the same manner as tools, coveralls and other expense items are issued and controlled.

A new Policy Guide on the issue and control of protective clothing and equipment is being issued.

In connection with the program covering construction equipment to be held for future use, upon completion of the closeout of the current Kaiser and Blaw-Knox construction programs the Commission has approved the plan presented by General Electric. A work order for \$5,000 has been issued to the Project Section to proceed with a survey and tabulation of tentative data required to identify the items to be retained, their location, condition, date available, and storage requirements in connection therewith. This list will be reviewed by General Electric and Commission personnel and an approved list prepared of the equipment to be retained, together with the designated storage location. The equipment will be properly preserved and moved to storage by the construction contractors. After being placed in proper storage, it will be taken up on a special ledger account, Construction Equipment Held for Future Use, and placed in the custody of the Stores Unit for warehousing control.

Work is continuing with field personnel on working out some better control system for warehousing and recording equipment not in use but not excess. There is a considerable quantity of this equipment stored in various locations around the plant that should be recorded and placed in controlled warehousing channels.

A proposed Policy Guide is being circulated which will establish a plant policy in regard to reporting and controlling laid up facilities. Considerable difficulty has been encountered in the cannibalization of some of these facilities.

A survey has been conducted of the plant areas in cooperation with the landlords concerned and steps taken to clean up miscellaneous property lying around not being used. In one area alone sixty-two items were pointed out that should be disposed of. Steps have been taken to issue the necessary Property Disposal Requests where items of this nature have been located. As a result, the appearance of the plant is materially improving and property is being properly disposed of.

Steps were also taken to point out to the AEC that the large number of construction forms from the Purex plant placed in the southeast corner of 200 East Area, immediately adjacent to the road, were very unsightly and should be removed.

One hundred requests for the disposal of property were investigated, processed and approved during the month.

Appropriations Unit

Project proposals and informal requests which were processed by Appropriations Unit and directives issued by the Commission during the month of August are shown in the following list:

Hanford 4X Program

A revised project proposal of the 200 and 300 Areas portion of the Program requesting authorization of the installation of a third extraction cycle in the 221-T plant was forwarded to the AEC August 13. With concurrence of GE, the AEC authorized the "T" Plant Third Extraction Cycle as a separate project. By directive, authorized funds for the over-all 200 and 300 Areas project (CG-597) were reduced from \$500,000 to \$450,000, and the "T" Plant project (CG-603) was authorized \$39,000.

CG-558 - Reactor Plant Modifications for Increased Production

Project proposal requesting authorization of poison column charge-discharge equipment at 105-F as a part of the scope of the work was approved by the AEC August 17.

CG-562 - Waste Metal Recovery Plant Modifications

Project proposal requesting additional funds in the amount of \$165,000 (total funds requested \$385,000) to make equipment alterations necessary to allow operation of the two production lines in Building 221-U in series was forwarded to the AEC August 25.

CA-596 - Central Mask Washing Station, Building 2723-W - Separations

Project proposal requesting \$22,000 (GE \$5,700) to design and install a central mask-washing facility to be located in the 2723-W Building was forwarded to the AEC July 30. By letter of August 18, D. F. Shaw to W. E. Johnson, supplemental information was requested by the Commission. This information was furnished by letter of August 24, J. E. Maider to D. F. Shaw.

CG-598 - Purex Acid Fractionator

Project proposal requesting \$590,000 to provide facilities in and near the 202-A Building for the vacuum fractionation of nitric acid that will be recovered from the Purex operation was forwarded to the AEC July 30.

CG-600 - 100-C Alterations

Project proposal requesting \$725,000 for design procurement and field work to attain increased water flow for the 100-C reactor plant was forwarded to the AEC August 23.

CG-602 - Remote Sampling Equipment - Hot Semiworks

Project proposal requesting \$30,000 for the installation of a shielded remote sampling device in the Hot Semiworks 201-C Building was forwarded to the AEC August 25.

Appropriations Unit - continued

CG-605 - Installation of Additional Generating Capacity - 189-D, Test
Laboratory

Project proposal requesting \$28,000 for the installation of a 375 KW motor generator set designed to operate in parallel with existing generators used for reactor heat transfer tests being conducted at the 189-D Building was forwarded to the AEC August 26.

SF ACCOUNTABILITY SECTION
MONTHLY REPORT--AUGUST, 1954

The current accounting controls covering Metal Preparation Section indicate satisfactory performance. For the first time we have achieved a control under which the monthly accumulation of the Factor Weight Difference account is so small that for practical considerations, factor weight and actual metal weight are synonymous. The major problem in the maintenance of this control status is in the adaptation to basic process revisions.

Expansion of SF Process Flow considerations has now covered the current canning process with process standards being established during August. For historical purposes a similar chart was established for the triple dip Al-Si process as further data associated with the Normal Uranium Manual.

The month of August will provide the first application of standard heels in Redox dissolvers in which the values are applied for both beginning and ending inventory. Standard ratios for Redox were dominated by the June and July shut down. Re-establishment of more normal operating conditions are expected concurrent with re-establishment of operations. Inventory Inspection activities will be directed towards Redox for August month-end.

SF Process Flow Chart for Bismuth Phosphate has been completed.

Recalibration of the 15-1 and 15-6 tanks have been completed with application scheduled for 9-1-54. September performance should reflect freedom from the bias previously associated with TBP-UO₃ transfers.

Due to the restricted use of the mass spectrometer almost exclusively used for U-235 assay of UO₃ shipments, the cost per assay has been excessive. Potential use of a quantometer is now under consideration.

The hot press canning of enriched slugs was placed on a production basis.

The plutonium recycle from Isolation (231) to concentration (224 Bldg.) continues at a high level. This change has been concurrent with the establishment of low level material. Production approved controls include allowance of run losses to waste as high as six per cent if required to maintain production. September results should reflect these operating conditions. These conditions are reserved to low level material.

The turnings fire in Metal Fabrication has been the object of intensive recovery operations. Up to the present time 88 per cent of the plutonium involved has been recovered.

Coulometrics determinations are now used for F-10-P measurement in conjunction with the radioassay method.

Successful negotiations with Oak Ridge National Laboratory resulted in the shipment of an additional 955 grams Pu from Inactive Status inventory. This brings the July--August total to an equivalent \$635,000.00 reduction in inventory and materially reduces the inventory of reduction crucibles on hand.

FINANCIAL DEPARTMENT PERSONNEL AND ORGANIZATION

AUGUST 1954

	<u>Current Month</u>	<u>Prior Month</u>
<u>Personnel Changes During Month</u>		
Employees at beginning of month	379	375
Additions and transfers in	14	15
Removals and transfers out	(7)	(11)
Employees at end of month	<u>386</u>	<u>379</u>
 <u>Personnel by Unit at Month-End</u>		
<u>General</u>	<u>7</u>	<u>7</u>
 <u>Audits and Procedures Section</u>		
Accounting Procedures	2	2
Administrative Planning	2	3
Internal Audit Unit	13	14
Reimbursement Accounting	<u>5</u>	<u>3</u>
	<u>22</u>	<u>22</u>
 <u>Cost and Budgets Section</u>		
Consolidations and Budgets Unit	8	8
Engineering Cost Unit		
General	5	5
Design Section Costs	7	7
Project Section Costs	16	16
Technical Section Costs	11	11
General Cost Unit		
General	2	2
Community Operations and Real Estate	7	9
Medical	3	3
Plant Auxiliary Operations	17	17
Radiological Sciences and others	8	8
Manufacturing Cost Unit		
General	3	2
Analysts	9	10
Budgets and Control	16	15
Records and Reports	<u>15</u>	<u>15</u>
	<u>127</u>	<u>128</u>
 <u>General and Personnel Accounting Section</u>		
Accounts Payable Unit	31	33
Accounts Receivable Unit	22	22
General Books Unit	19	17
Personnel Accounting Unit *		
General	2	2
Monthly Payroll	11	11
Benefit Plans Accounting	12	12
Personnel Records, Non-Exempt	9	7
Payroll Reports	7	5
Weekly Payroll	19	17
Payroll Planning & Analysis	<u>6</u>	<u>6</u>
	<u>138</u>	<u>132</u>

1203725 Reorganized during August, 1954. Figures for Prior Month adjusted to reflect new organization.

	<u>Current Month</u>	<u>Prior Month</u>
<u>Property Accounting Section</u>		
Appropriations Unit	5	5
Inventory Accounting Unit	12	12
Plant Accounting Unit	36	35
Property Management Unit	3	3
General	<u>2</u>	<u>2</u>
	<u>58</u>	<u>57</u>
<u>SF Accountability Section</u>		
Measurement Methods Unit	5	5
Process Flow Unit	4	4
SF Accounting Unit	3	3
SF Records and Reports Unit	<u>15</u>	<u>15</u>
	<u>27</u>	<u>27</u>
<u>Rotational Trainees</u>	<u>7</u>	<u>6</u>
	<u>386</u>	<u>379</u>

PLANT PROTECTION SECTION
MONTHLY REPORT - AUGUST 1954

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	<u>Beginning of Month</u>	<u>End of Month</u>	<u>Increase</u>	<u>Decrease</u>
Staff	2	2		
Administration Area Maintenance	100	101	1 (a)	
Security and Patrol	491	492	1 (b)	
Fire Protection	136	136		
Office	207	202		5 (c)
TOTALS	<u>936</u>	<u>933</u>	<u>2</u>	<u>5</u>

NET DECREASE: 3

(a) - Administration Area Maintenance

2 - New Hires
 1 - Transferred out

(b) - Security and Patrol

1 - New Hire
 2 - Transferred in
 1 - Reactivated
 2 - Deactivated
 1 - Transferred out

(c) - Office

15 - New Hires
 18 - Transferred out
 2 - Terminations

10

FIRE PROTECTION UNIT

Fire Protection Unit responded to 18 calls during the month, 12 of which were in construction areas. Losses were \$15.00 in operations fires and \$950.00 in construction. The largest single loss was experienced by a roofing contractor when a tar pot turned over and destroyed materials and miscellaneous property valued at \$925.

Drills Held during August

Outside drills held	115
Inside drills held	119
	<hr/>
Total	243

32,300 feet of fire hose and 991 feet of ladders used for drill purposes during August.

Fire Department officers held four classes on artificial respiration which were attended by 94 members of various departments.

Ten Round Table discussions were held within the Fire Protection Unit, with 11 members attending each discussion. Exempt and non-exempt.

One Information Meeting was held with six members attending. Exempt and non-exempt.

Fire Extinguishers

Inspected	1,622
Installed or relocated	5
Tested	510
Delivered to new locations	5
Seals broken and not reported	31
Serviced	451
Weighed	547

Gas Masks

Inspected	79
Serviced	5

OFFICE SUB-SECTION

Clerical Services Unit

Plant Mail and Addressograph

Internal mail continues the upward trend both in volume and bulk. Postal mail remained normal as a slight decrease in regular outgoing postal mail was offset by an increase in registered and insured mail.

Special assignments included the preparation of Weekly Rating Sheets for all employees (name stickers applied to Form "A", then Form "A"-1, and three copies of "A" stapled together, sorted by suffix, and distributed to Section Managers.) The letter and attachments of the "Let's Talk it Over" program were also prepared and sent out by Mail Room personnel. One hundred twenty-nine Organization and Policy Guides were accumulated in groups and sent out in envelopes with an assist from the Steno Pool. One Stores catalogue distribution and the more routine distributions of Monogram, Employee News Letters, Safety and Security Bulletins, etc. were made.

Addressograph volume remained about normal due to the gathering of the Organization and Policy Guides and addressographing an envelope for each twenty or thirty guides instead of individually. However, since envelopes are of necessity hand run, no real time saving was effected for the Addressograph Group, but mailing was greatly facilitated.

<u>Types and Pieces of Mail Handled</u>	<u>July</u>	<u>August</u>
Internal	3,594,580	3,689,681
Postal	74,781	74,654
Special	2,083	1,906
Registered	1,340	1,625
	<hr/>	<hr/>
	3,672,784	3,767,866
Total postage used	\$3,031.31	\$1,849.31
Total teletypes handled	2,653	2,646
Total store orders handled	947	825

<u>Addressograph</u>	<u>July</u>		<u>August</u>	
	<u>Number of Runs</u>	<u>Total Copies</u>	<u>Number of Runs</u>	<u>Total Copies</u>
<u>Type of List</u>				
Plant name list	114	162,653	116	168,382
Housing list	28	68,326	29	62,518
Payroll list	19	40,445	22	36,184
Total new plates	3,012		1,865	
Total corrected plates	6,152		5,145	
	<hr/>		<hr/>	
	9,164		7,010	

Central Printing

GE Security has accepted the proposal of Central Printing to use pre-sensitized photographic paper masters for all printed material of a secret or confidential category. Central Printing will retain the paper masters and destruction will be effected by burning the masters along with other classified paper scrap. The negatives and originals only will be transmitted to Classified Files. This new procedure will save much valuable space in Classified Files and also do away with the present slow and costly procedure of destroying metal plates by burning.

The preliminary approval issue of 50 copies of the Plant Organization Directory was printed and delivered August 19, 1954. Final corrections and revisions are presently being made by Salary Administration Section.

One hundred and twenty-nine Organization and Policy Guides, representing 263,750 copies, were released to the Mail Room for distribution during August.

<u>Work Completed</u>	<u>July</u>	<u>August</u>
Orders received	381	402
Orders completed	380	399
Back log	111.7	117.1
Copies printed	1,080,356	1,107,559
Negatives masked	564	839
Negatives processed	738	850
Photo copy prepared	456	338
Litho plates processed	772	984

Stenographic Services

The Stenographic Pool was moved from the 703 Building to the 707 Building on August 13.

Fourteen new employees were assigned to the Stenographic Pool in August - twelve inexperienced Stenographer-Typists and two experienced Stenographers. Seventeen transfers were effected and thirty-four temporary assignments were made.

<u>Breakdown of Hours</u>	<u>July</u>	<u>August</u>
Meeting time		4.5
Vacation time		120
Machine Transcription	39	0
Letters	30	108
Rough Drafts	76.5	84.5
Dittos, duplimats and xerography	454.5	349
Miscellaneous	597.5	577
Holiday Time	144	0
Training time	659	302
Absentee time	16	
Unassigned time	109	60
	<hr/>	<hr/>
Total	2,125.5	1,605
Employees on loan to other units	2,541.5	2,303
	<hr/>	<hr/>
Grand Total	4,667	3,908

Plant Duplicating

On August 2, 1954, a Verifax Type I Printer was installed in the 300 Area Duplicating Office. This equipment will enable the subject office to provide rapid and economical service on orders requiring a minimum number of copies. It will also be utilized in conjunction with Ozalid equipment to reproduce extra copies of documents as required by Classified Files.

1205730

Rental costs were reduced this month by eliminating one office previously occupied in 760 Building. The consolidation made an office available for use by Project Section, and was accomplished without any appreciable loss in efficiency due to the reduction in work space.

Among priority orders handled this month was the "Graduate School of Nuclear Engineering Announcement" processed by Central Duplicating, 703 Building. This order consisted of 27 originals, with 1,400 copies required on each - a total of 37,800 copies. The order was completed in one and a half working days. The 100-H Duplicating office processed a "Reactor Section Landlord Report", an order consisting of 144 originals and a total of 3,600 copies, in less than four working hours.

<u>Plant Duplicating Statistics</u>	<u>July</u>	<u>August</u>
Orders received	2,994	2,865
Orders completed	2,970	2,894
Orders on hand	80	72
Offset plates	13,240	14,676
Offset copies	722,226	814,882
Verifax masters	1,204	1,220
Verifax copies	3,247	3,764
Stencils	505	44
Stencil copies	7,664	565
Ditto masters	280	249
Ditto copies	5,125	4,506
Zerox plates	1,314	1,358
Total copies duplicated	739,576	825,075

Records Control Unit

Quantity of records received, processed and stored:

Employee and Public Relations Department	45	Standard Storage Cartons
Engineering Department	167	" " "
Financial Department	123	" " "
Manufacturing Department	28	" " "
Plant Auxiliary Operations Department	113	" " "
Radiological Sciences Department	25	" " "

Total 501 Standard Storage Cartons

Persons provided records service: 826

Cartons of records destroyed: 171

Records cartons issued: 514

Percentage of Records Service Center Vault (exclusive of North Richland) occupied by records is 86.8%.

Thirty-two requests for file cabinets were received, eighteen requests were filled, ten requests were cancelled. Four requests are pending. Five fireproof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a savings of \$750.00 (\$225.00 cost of combination locked cabinet minus \$75.00 cost of key locked cabinet equals \$150.00 savings per cabinet exchanged.) Eight key locked cabinets were picked up with no exchange and returned to stock for re-issue.

Category evaluation of Environmental Contamination Measurement records consisting of 36 individual records pertaining to environmental contamination was developed and submitted to the Radiological Sciences Department for internal approval.

Uniform filing was established in four offices during the month, a total of four hundred eighty-eight offices have installed the uniform filing system to date. Fourteen rechecks were made on established offices.

Office Equipment Unit

Office Furniture

Delivery of office furniture requirements for 100-K Area has tentatively been set for September 15, 1954. The bulk of this furniture will be of new category with exception of desks and tables which will be rehabilitated serviceable equipment.

The new Transportation facility is scheduled for occupancy by September 15, 1954. Tables purchased for this project have not been received to date, however, delivery will be made in time for occupancy of building.

The activity in issues and receipts of furniture was high during the month. The increase of movement of office furniture was caused from reorganization of Manufacturing Department. A detail of pieces of furniture handled is as follows:

<u>Item</u>	<u>Received by Credit S.O.</u>	<u>Issued</u>	<u>Salvage</u>
Blackboards	1	2	0
Bookcase	2	6	0
Chairs	121	146	37
Costumer	6	5	1
Card File	5	13	1
Cabinet	22	148	3
Desk	89	80	5
Table	45	63	13
Daveno	4	3	5
Miscellaneous	58	177	0
	353	643	65

TOTAL: 1,061

The Inventory value of Caption 93 (expense office furniture) was \$33,232.00 at the close of the month of August. The previous month was \$14,874. The increase is caused from stock piling furniture for 100-K Area. These stocks will be issued during September and October.

Office Machines

Ninety-six machines were excessed during the month and six machines were picked up not on IBM inventory list. This left a balance of 5,145 machines in service and stock.

An IBM listing of office machines in excess records will be made by Stores Unit from Master IBM Inventory cards in dead file. This list will be prepared by Computing Unit from Stores Unit's inventory of machines on hand. Office Equipment will transfer master cards to excess deck when machines are excessed from a service category. The cost incurred in preparing and maintaining this list will be the responsibility of Stores Unit.

One Flexowriter typewriter and tape punch machine has been ordered for Plant Equipment Record Unit. This machine will be used to set up IBM record card control on plant equipment. The Procedure Unit is planning on five additional machines for future programming.

A compilation of office machines in service was made to establish number of machines estimated to be in service on January 1, 1955 and June 30, 1955. This study indicated that there would be a gradual decrease of approximately 1,000 machines in service by July 1, 1955. This decrease would be caused from Kaiser Engineers and Blaw-Knox companies completing their construction program.

Office Machine Repair Unit

During this month a procedure was set up to permit repairing of hand numbering machines. For each numbering machine repaired there will be a flat charge of \$5.00 per machine. This cost will include cleaning and replacing worn parts.

Inspection and cleaning of all Addressograph machines was started this month and will be completed by September 16.

During the month, 578 machine repair tickets were processed through IBM, 15 repair tickets were processed on a direct charge making a total of 593 for the month.

Instrument Repair

Special work was performed for Kadlec Hospital consisting of a study of the air conditioning system in the OB wing. The purpose of the study was to determine a satisfactory means of balancing out the system. An air flow graph was made using a Taylor Anemometer.

A report was prepared for the Finance Section outlining the maintenance procedure and methods of reducing cost of maintaining IBM attendance recorders.

Laundries Unit

<u>200-West Laundry</u>	<u>July</u>	<u>August</u>
Pounds Delivered	211,158	257,400
Pounds Rewashed	14,483	19,739
	<hr/>	<hr/>
Total Dry Weight	225,641	277,139
<u>Monitoring Section</u>		
Poppy Check - Pieces	206,460	232,655
Scaler Check - Pieces	291,543	339,766
	<hr/>	<hr/>
Total Pieces	498,003	572,421
<u>700 Area Laundry</u>		
Flatwork - Pounds	26,328	37,932
Rough Dry - Pounds	21,598	19,828
Finished - Pounds	2,481	2,209
	<hr/>	<hr/>
Total Weight	50,407	59,969
Estimated Pieces	66,033	78,559

The concurrence of the AEC was obtained to a proposal that the 700 Laundry be closed down effective November 1, 1954. Suitable commercial sources are available to perform the work at reasonable cost. Personnel will be transferred to the 200-W Laundry on November 1 for training preparatory to start up of a second shift operation on December 1. The second shift will be required to handle volume from 100-K. CG-558 and Purex in 1955.

ADMINISTRATION AREA MAINTENANCE SUB-SECTION

AEC-114 New Transportation Facilities: Contractor's September 15 estimated completion date appears impossible to meet.

Main Shop Building: Complete except for final connections in the ductwork, electrical hookup to fixtures in some areas and to equipment yet to be installed. Painting, except for touchup, will be complete within two weeks. Plumbing is perhaps farthest behind and may not be completed for three weeks. Block and concrete walls have been cleaned during the past month and the openings between wall panels have been grouted and caulked.

Dispatcher Building: Complete except for minor electrical, plumbing and general carpentry and paint touchup. The heating system has been completed during the past month.

General Area: Shot and cover, in three successive applications, has been completed in the various parking areas. The railroad tracks have been completed, sand dunes removed and sloped as required, cyclone fence separating various areas installed, and railings in the bus lanes completed and painted. Installation of guard rails and bumper rails in the parking lots is proceeding and should be complete within the next ten days.

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The manual work force has varied from 87 to 85 personnel.

- CA-561 713 Building Alterations: Work progressing satisfactorily. It is anticipated that this facility will be ready for occupancy prior to December 1, 1954.
- CA-533 Official Telephone Exchange: Work progressing satisfactorily.
- IR-179 703 Basement Alterations, Fifth Wing, North: It is not intended to reactivate this proposal. Study is being made to determine feasibility of converting, with plant forces, a portion of 717-A to accommodate photography unit.
- Additional Office Space - Central Stores Warehouse: No further action taken on this project proposal.

Appropriation Request approved for \$30,000 purchase of Hauserman partitions. Purchase requisition is in process of preparation.

Eighty-three lineal feet of Hauserman partition and four doors were used in several minor installations - one in 300 Area, two in 200-W Area and four in 700 Area.

Ten office moves were made during the month.

Space in fifth wing basement of 703 Building was equipped and assigned to Northwest Utilities Group on August 31.

General Maintenance

Hauserman partitions were installed and minor changes were made in a section of 707 Building to accommodate 700 Area First Aid and Stenographic Pool.

Restroom facilities for male personnel were completed in 744 Building.

Approximately 70 windows were weather stripped on 760 Building and first floor of 761 and 762 Buildings.

General Electric float was made for Atomic Frontier Days parade.

Routine miscellaneous painting was performed in conjunction with scheduled cycle painting of office space.

Several miscellaneous signs were made for Stores.

Approximately 275 sign blanks were made for Security signs and copy was painted on approximately 85 of these signs.

Signs at Richland Barricade were changed from neon to fluorescent, to provide more economical and convenient maintenance.

Automatic emergency generator control system was installed for Civil Defense and Emergency Officer quarters.

Additional fluorescent light fixtures were installed in Buildings 713, 707, and in the hospital.

One new hot plate was fabricated and four repaired for Bio-Assay Laboratory.

Fire alarm system in 703 Building was repaired.

New set of slip rings was fabricated for No. 3 air raid siren.

Emergency throw-over switch was installed to protect generators at 702 Building in case of an emergency.

Cabinet and conduit for telephone PBX board were installed at Central Stores.

Installed door interlock between office and warehouse sections at Central Stores.

In addition to routine locksmith work, locksmith repaired 50 door combinations at 234-5 Buildings and repaired large vault locking mechanism at 200-East.

Machinist repaired well shafts and pump parts for Community water wells.

Revision of fire line at hospital was completed and additional post indicator valve was installed.

Cooling system in 722-N Conference Hutment was revised to provide more quiet operation.

Two air conditioners were installed at Stores Yard No. 2.

Broken water main was repaired at Stores Yard No. 2.

Water lines at Riverland were altered to bypass wooden tank and to feed water from high tank only.

Annual repairs and valve repacking on steam lines in underground pits were completed.

Radiator valves are being repacked and traps repaired in 703 Building radiators.

Program of replacing radiator nipples, which are failing as a result of corrosion after approximately ten years of service, is progressing.

Overhaul of No. 1 and No. 4 boilers at 784 Building is complete except for stoker repair, which is 50% complete. New hammers were installed in coal crusher.

Boiler at Central Stores was checked and repairs made for winter operation.

Repairs were made to boiler at Hanford hot-mix plant, which is used to heat seal coat for Transportation Section.

Fine mesh window screen has been removed from restroom exhaust fans and replaced with 1/2" hardware cloth, to prevent restriction of air flow and damage to fans.

Building Services

Some difficulty was experienced with seal remover and floor seal. Tests are being made and contacts are being made with vendors to assure a dependable supply of fast-drying seal.

Revision of janitor schedule was made in 712 Records Center and 770 Building, to provide more economical utilization of manpower. Central Stores janitor service was switched to day shift.

Steam Operation

No. 2 boiler was in operation at the beginning of the month with Nos. 3 and 4 in reserve and No. 1 approaching completion of major overhaul.

On August 10, No. 2 boiler was removed from service and No. 1 placed in operation, remaining in service for the balance of the month.

Following completion of several repair jobs, No. 2 boiler was fired up on August 17; however, detection of a leaking steam outlet flange on the west drum caused this unit to be withdrawn from contemplated service. Repairs were later accomplished, leaving this boiler again in a reserve status.

No. 4 boiler received its biennial minor overhaul during the month. Completion of this job is now awaiting replacement parts for the stoker feed mechanisms. Hence, at the close of the month, No. 1 boiler was in service, Nos. 2 and 3 in reserve, and No. 4 awaiting repair parts.

Valve on both the suction and discharge feedwater headers were repacked without interruption of service.

A water line was extended from the feed water suction header to the chemical mixing tank, which permits the use of hot, deaerated soft water in making up solutions for the chemical feeders. Formerly only cold city water was available, resulting in variations of the batches of feedwater treatment chemical solutions.

Rail receipts of coal were resumed on August 9, after using coal from the stockpile exclusively for almost three months.

The quantity of steam generated at the 784 plant was 3.1% less than for the same period of the previous year.

Coal Consumed: 478.10 net tons.

Steam generated:	6,808.2 M. Lbs.
Steam leaving plant:	5,634.8 M. Lbs.
Steam delivered:	3,649.6 M. Lbs.

Total water softened:	1,096,900 gallons
Total soft water sent to Kadlec Hospital:	149,870 gallons
Total soft water sent to 784 Heating Plant:	947,030 gallons

SECURITY AND PATROL UNIT

Document Report

Number of classified documents and prints unaccounted for as of August 1: 329
(122 of the above 329 documents are chargeable to E. L du Pont
de Nemours & Co.)

Number of classified documents and prints reported as unaccounted for during August:

41

Number of classified documents and prints either recovered or downgraded during August: 7
(One of the seven documents is chargeable to E. I. du Pont de Nemours & Co.)

Number of classified documents and prints remaining unaccounted for as of September 1, 1954: 363
(121 of the above 363 documents are chargeable to E. I. du Pont de Nemours & Co.)

The Non-Technical Document Review Board held one meeting during August and reviewed a total of 47 documents. Of this number -

13 were downgraded to "Official Use Only",
28 had their classification retained, and
6 were not within the scope of the Board.

Security Education

Six items which appeared in the Works NEWS were concerned with the subject of security.

There were 314 security meetings held and attended by 4,453 employees of the General Electric Company. A representative of the Security and Patrol Unit showed one of the security films at some of these meetings as indicated below:

"Words Are Weapons" was shown at 12 meetings, each with an average attendance of 20 employees.

"The Calculated Risk" was shown at two meetings, each with an average attendance of 25 employees.

"Signal 99" was shown at two meetings, each with an average attendance of 25 employees.

"Only The River" was shown at three meetings, each with an average attendance of 32 employees.

The following security posters were posted in the plant areas and community of Richland during the month:

2,000 copies of the Security pamphlet "A-B-C" with the slogan "Traveling Far?" were distributed to personnel.

250 permanent security poster boards for future security material were installed in the areas.

GE Security Bulletin No. 86, entitled "Receipts Are Valuable to You", was issued August 20.

One hundred and eleven employees of the General Electric Company received a "Q" security orientation talk from either a representative of the Security Unit or a Security Patrol supervisor during the month of August.

Statistical Report of Security Patrol Activities

	<u>100-B</u>	<u>100-D</u>	<u>100-F</u>	<u>100-H</u>	<u>100-K</u>	<u>200-W</u>	<u>300</u>
Pat Searches	87	87	49	10	0	0	0
Escorts	8	14	5	25	4	64	49
Ambulance runs	0	4	3	2	0	4	4
Passes issued:							
Temporary one day	78	9	5	10	1	42	150
Travel	0	0	0	0	0	0	77
Red Tag	163	98	48	18	0	473	116
Telephonic	0	0	0	0	0	0	19
Supervisor's Post Contacts	318	183	215	155	317	700	512

Other Security Patrol Activities (computed by hours): 300 & 700

Security File Check	149	205	154.8*	341.14*	422	469	1,334
Building Check	320	29			648	589	696

* In the 100-F and 100-H Areas, the Security File Check and Building Check are combined into one figure.

Arrest Report

<u>Violations</u>	<u>Number of Violations</u>	<u>Cases Cleared</u>	<u>Fined</u>
Negligent Driving with Liquor Involved	1	1	1
Speeding	2	2	2
	—	—	—
Total	3	3	3

Citation Tickets issued: 3
Warning Tickets issued: 45

Security Patrol Training Activities

155 Security Patrolmen received classroom instruction during the month of August.

226 Security Patrolmen received firearms training during the same reporting period.

Training courses were as follows:

Safety Class 1/2 hour
Security Class 1/3 hour
Operations Class 1 hour

Security Patrol Post Changes

On August 2, the 313 Construction Badge House post, 300 Area, was discontinued.

The 100-K Rover post was discontinued for 165-190-KW on August 2.

August 4 was the date when the temporary post, 105-KE Corridor 15, was established.

Unaccounted for Document Status as of August 31, 1954

<u>Material</u>	<u>Classifications</u>			<u>Total</u>
	<u>Top Secret</u>	<u>Secret</u>	<u>Confidential</u>	
Documents	0	119	18	137
Prints	0	90	9	99
Specifications	0	4	0	4
Drawing Schedules	0	2	0	2
Tracings	0	0	0	0
	—	—	—	—
	0	215	27	242

Security Administration

Daily Badge Log Entries	2,187
"Q" clearances	111
Formal "P" clearances issued	53
"P" Approval clearances issued	35
Category access granted	40
Category access withdrawn	50

July 29 through August 27 rephotographing program:

Number of "A" badges	38
Number of "B" badges	115
Photos for passes	20
Total	173

General Electric Security representatives have started a continuous field audit of security performance. Included in this audit will be a physical verification of classified document and print holdings as certified by the monthly self-inventory. The inspectors will have in their possession the latest inventory certifications for comparison with actual holdings.

During these visits, which will be conducted on an annual basis, the inspectors will thoroughly review office security procedures, particularly methods of storing and handling classified data. They will also have a listing of past administrative security violations and will discuss methods of preventing repetition with the responsible persons.

The inspectors will make their visits unannounced and reports of irregularities will be forwarded to Department Managers for corrective action.

The inspectors will also make initial contacts on administrative security violations, conduct immediate searches for missing material, survey protective measures, and be available as guest speakers for departmental security meetings in addition to their audit activities. One additional inspector has been added to the Field Inspection Group to assure that the audit functions can be performed on a regular annual basis.

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HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING AUGUST 31, 1954

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>	
					<u>Class.</u>	<u>Unclass.</u>
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT						
I. Visits to other Installations						
T. G. Marshall to: Knolls Atomic Power Lab. Schenectady, New York	Discuss technical aspects of recruiting qualified technical personnel	R. E. Hunt L. L. German	8-23-54	8-26-54		X
ENGINEERING DEPARTMENT - ENGINEERING ADMINISTRATION SECTION						
I. Visits to other Installations						
O. W. Rathbun to: National Lead Company Fernald, Ohio	Observe fabrication of uranium	J. M. Ciborski	8-9-54	8-13-54		X
ENGINEERING DEPARTMENT - ADVANCE ENGINEERING SECTION						
I. Visits to other Installations						
R. M. Fryar to: General Electric Co. Schenectady, New York	Discuss turbine systems	R. G. Lorraine	8-5-54	8-6-54		X
R. M. Fryar to: Feed Materials Production National Lead Company Fernald, Ohio	Observe uranium fabrication	J. M. Ciborski	8-3-54	8-3-54		X
R. M. Fryar to: Simonds Saw & Steel Co. Buffalo, New York	Observe experimental fabrication	C. H. Emery	8-4-54	8-4-54		X

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data</u>	
					<u>Class.</u>	<u>Unclass. Areas</u>
J. R. Triplett to: Knolls Atomic Power Lab. Schenectady, New York	Attend a theoretical conference on nuclear physics	H. Hurwitz, Jr.	8-23-54	8-27-54	X	
W. K. Woods to: Knolls Atomic Power Lab. Schenectady, New York	Discuss SAR program	K. R. Van Tassel	8-5-54	8-5-54	X	
<u>ENGINEERING DEPARTMENT - DESIGN SECTION</u>						
<u>I. Visitors to this Works</u>						
P. E. Carroll Babcock and Wilcox Co. Beaver Falls, Pennsylvania	Industrial participation study agreement	O. W. Priebe N. G. Wittenbrock W. L. Pearl	8-24-54	8-25-54	X	105-KW 700
M. A. Cordovi Babcock and Wilcox Co. Beaver Falls, Pennsylvania	Industrial participation study agreement	O. W. Priebe N. G. Wittenbrock W. L. Pearl	8-24-54	8-25-54	X	700
C. H. Gay Babcock and Wilcox Co. Beaver Falls, Pennsylvania	Industrial participation study agreement	O. W. Priebe N. G. Wittenbrock W. L. Pearl	8-24-54	8-25-54	X	700
D. N. Hanson Radiation Laboratory Berkeley, California	Experimental work in design engineering	M. W. Cook	8-30-54	8-31-54	X	200-W Redox 300 XXX 700
J. W. Landis Babcock and Wilcox Co. Beaver Falls, Pennsylvania	Industrial participation study agreement	O. W. Priebe N. G. Wittenbrock W. L. Pearl	8-24-54	8-25-54	X	700
G. J. Schoessow Babcock and Wilcox Co. Beaver Falls, Pennsylvania	Industrial participation study agreement	O. W. Priebe N. G. Wittenbrock W. L. Pearl	8-24-54	8-25-54		700
<u>II. Visits to other Installations</u>						
G. L. Locke to: Argonne National Lab. Lemont Illinois	Collect data on heat transfer and boiling	R. J. Weatherhead	8-31-54	8-31-54	X	

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<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class.</u>	<u>Unclass.</u>	<u>Areas</u>
W. J. Love to: U. S. Atomic Energy Comm. Idaho Falls, Idaho	Discuss in-pile boiling experiments and reactor stability tests	- -	8-12-54	8-20-54			
W. L. Pearl to: Knolls Atomic Power Lab. Schenectady, New York	Meeting on alternate materials for new reactors	R. F. Koenig	8-11-54	8-12-54	X		
O. W. Priebe to: Babcock Wilcox Co. Alliance, Ohio	Discuss high pressure temperature pump and water recirculation loops	J. J. Owens R. U. Blaser	8-10-54	8-11-54	X		
O. W. Priebe to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Discuss high pressure temperature pumps for recirculation loops	H. F. Kongabel	8-17-54	8-19-54	X		
C. A. Pursel to: Argonne National Lab. Lemont, Illinois	Collect data on heat transfer and boiling	R. J. Weatherhead	8-31-54	8-31-54	X		
C. A. Pursel to: Knolls Atomic Power Lab. Schenectady, New York	Collect data on heat transfer and boiling	G. M. Roy	9-2-54	9-3-54	X		
C. A. Pursel to: Columbia University New York, New York	Collect data on heat transfer and boiling	C. F. Bonilla	9-1-54	9-1-54	X		
G. L. Locke to: Columbia University New York, New York	Collect data on heat transfer and boiling	C. F. Bonilla	9-1-54	9-1-54	X		
G. L. Locke to: Knolls Atomic Power Lab. Schenectady, New York	Collect data on heat transfer and boiling	G. M. Roy	9-2-54	9-3-54	X		

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ENGINEERING DEPARTMENT - TECHNICAL SECTION

I. Visitors to this Works

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
W. L. Chase Phillips Petroleum Company Idaho Falls, Idaho	Discuss CPM Program	F. W. Woodfield R. E. Tomlinson	8-2-54	8-3-54	X	200-E XXX 200-W Redox, 221-U 300-L XXX
A. Chetham-Strode, Jr. Radiation Laboratory Berkeley, California	Discuss transuranic chemistry and nuclear and chemical properties of heavy elements	E. M. Kinderman	8-17-54	8-21-54	X	100-H 105 200-W Redox 300-L XXX
M. J. Feldman Oak Ridge National Lab. Oak Ridge, Tennessee	Inspect radiometallurgy facilities	L. D. Turner	8-26-54	8-27-54	X	100-B 105-B, 105-C 300-L XXX
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile loop facilities	J. A. Berberet G. E. Wade	8-2-54	8-3-54	X	105-KW 100-H 105 300-L XXX; 700
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile loop facilities for KAPL-120	G. E. Wade	8-16-54	8-17-54	X	105-KW 100-D XXX 100-H 105 300-L XXX
T. J. E. Glasson Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile coating loops	G. E. Wade L. D. Turner	8-31-54	9-3-54	X	100-D XXX 100-H 105 300-L XXX; 700
B. R. Hayward North American Aviation Co. Downey, California	Discuss fuel element program	F. W. Albaugh E. A. Eschbach R. W. Benoliel	8-16-54	8-19-54	X	100-B 105-B, 105-C 300-L 303
C. S. King King Blockson Chemistry Co. Joliet, Illinois	Discuss teslon bellows	V. R. Cooper	8-26-54	8-26-54	X	300-L XXX
G. E. Martin Knolls Atomic Power Lab. Schenectady, New York	Discuss in-pile coating loops	G. E. Wade L. D. Turner	8-31-54	9-1-54	X	100-D XXX 100-H 105 300-L XXX; 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas

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S. W. Mrozowski University of Buffalo Buffalo, New York	Technical discussion on graphite production and irradiation damage of graphite	J. F. Music L. P. Bupp	8-5-54	8-15-54	X	105-KW
H. M. Schmitt Minneapolis Honeywell Co. Minneapolis, Minnesota	Equipment installed in 105-KW	- -	8-31-54	9-2-54	X	105-KW
C. E. Stevenson Phillips Petroleum Co. Idaho Falls, Idaho	Discuss processing program	R. B. Richards	8-16-54	8-20-54	X	100-D 105 105-KW 200-E XXX 200-W 221-U, Redox 300-L XXX
G. W. Watt University of Texas Austin, Texas	Consultation on plant processes	O. H. Greager	8-16-54	8-20-54	X	200-E XXX 200-W Redox. 234, 235 300-L XXX
D. M. Wilsey All States Employee Schenectady, New York	Instrumentation work on in-pile water loop	G. E. Wade	8-31-54	12-31-54	X	100-D XXX 100-E 105 300-L XXX; 700
C. C. Woolsey North American Aviation Co. Downey, California	Discuss fuel element program	F. W. Albaugh E. A. Eschbach R. W. Benoliel	8-16-54	8-19-54	X	100-B 105-B, 105-C 300-L 303
II. Visits to other Installations						
A. G. Blasevitz to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on fuel element development program	D. W. White	8-19-54	11-1-54	X	
A. G. Blasevitz to: Battelle Memorial Inst. Columbus, Ohio	Consultation on fuel element development program	H. R. Nelson	8-23-54	11-1-54	X	
A. G. Blasevitz to: Ames Laboratory Ames, Iowa	Consultation on fuel element development program	F. H. Spedding	8-25-54	11-1-54	X	

NO	Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
						Class.	Unclass. Areas
120	E. D. Clayton to: Knolls Atomic Power Lab. Schenectady, New York	Attend theoretical physics conference	H. Hurwitz, Jr.	8-23-54	8-27-54		X
121	M. V. Davis Carbide and Carbon Oak Ridge, Tennessee	Consultation on process variables affecting nuclear performance of product	G. A. Garrett	8-5-54	8-6-54		X
122	M. V. Davis to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on process variables affecting nuclear performance of product	J. A. Cox	8-5-54	8-6-54		X
123	R. L. Dickeman to: Knolls Atomic Power Lab. Schenectady, New York	Attend theoretical physics conference	H. Hurwitz, Jr.	8-23-54	8-27-54		X
124	R. E. Hueschen to: Argonne National Lab. Lemont, Illinois	Discuss design of neutron spectrometer	Dr. Sidhu	8-5-54	8-6-54		X
125	D. C. Kaulitz to: Argonne National Lab. Lemont, Illinois	Discuss design of neutron spectrometer	Dr. Sidhu	8-5-54	8-6-54		X
126	L. W. Lang to: Carbide and Carbon Oak Ridge, Tennessee	Consultation on process variables affecting nuclear performance of product	G. A. Garrett	8-5-54	8-6-54		X
127	L. W. Lang to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on process variables affecting nuclear performance of product	J. A. Cox	8-5-54	8-6-54		X
128	B. R. Leonard, Jr. to: Phillips Petroleum Co. Idaho Falls, Idaho	Attend meeting of Nuclear Advisory Group for data on nuclear cross-section	R. L. Doan	8-26-54	8-27-54		X

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass.
Q. E. McCullough to: Bridgeport Brass Co. Adrian, Michigan	Discussion on fuel element technology	R. M. Treco	8-31-54	9-1-54		X
E. T. Merrill to: U. S. Atomic Energy Comm. technology problems Arco, Idaho	Discuss separations	J. L. Schwennessen	8-16-54	8-20-54		X
H. Neumann to: Knolls Atomic Power Lab. physics conference Schenectady, New York	Attend theoretical	H. Hurwitz, Jr.	8-23-54	8-27-54		X
E. C. Pitzer to: Knolls Atomic Power Lab. and corrosion program Schenectady, New York	Conference on coatings	A. P. Beard	8-18-54	8-20-54		X
E. C. Pitzer to: Battelle Memorial Inst. and corrosion program Columbus, Ohio	Conference on coatings	J. Faust	8-23-54	8-25-54		X
F. B. Quinlan to: National Lead Company Fernald, Ohio	Consultation on electronic equipment	J. T. Scheuer W. Ingram	8-31-54	9-8-54		X
J. W. Riches to: National Lead Company Fernald, Ohio	Fabrication of uranium	J. M. Ciborski	8-3-54	8-3-54		X
J. W. Riches to: Simonds Saw & Steel Lockport, New York	Fabrication of uranium	C. H. Emery	8-4-54	8-5-54		X
J. W. Riches to: Bridgeport, Connecticut Bridgeport, Connecticut	Fabrication of uranium	R. S. French	8-6-54	8-6-54		X
W. E. Roake to: Mallinckrodt Chem Wks. St. Louis, Missouri	Discuss oxide reduction and oxide ceramics	W. M. Leaders	8-4-54	8-4-54		X

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<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class.</u>	<u>Unclass.</u>	<u>Areas</u>
W. E. Roake to: National Lead Company Fernald, Ohio	Discuss oxide reduction and oxide ceramics	F. L. Cuthbert	8-5-54	8-5-54	X		
W. E. Roake to: Aircraft Nuclear Propulsion Lockland, Ohio	Discuss oxide reduction and oxide ceramics	W. J. Koshuba	8-6-54	8-6-54	X		
W. E. Roake to: Sylvania Electric Products Pittsburgh, Pennsylvania	Discuss oxide reduction and oxide ceramics	L. W. Lates J. L. Zambrow	8-9-54	8-10-54	X		
W. E. Roake to: New Brunswick Laboratory New Brunswick, New Jersey	Discuss oxide reduction and oxide ceramics	G. J. Petretic	8-11-54	8-11-54	X		
W. E. Roake to: Metal Hydrides Co. Beverly, Massachusetts	Discuss oxide reduction and oxide ceramics	M. D. Banus	8-12-54	8-13-54	X		
G. W. Stuart, Jr. to: Brookhaven National Lab. Upton, Long Island, New York	Discuss reactor physics	I. Kaplan	8-19-54	8-20-54	X		
G. W. Stuart, Jr. to: Knolls Atomic Power Lab. Schenectady, New York	Attend theoretical physics conference	H. Kurwitz, Jr.	8-23-54	8-27-54	X		
G. W. Stuart, Jr. to: Aircraft Gas Turbine Evansdale, Ohio	Discuss application of 701 calculator to pile physics	H. J. R. Grosch	8-30-54	8-30-54	X		
N. G. Wittenbrock to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Consultation on high pressure, high temperature pumps	H. F. Kongabel	8-18-54	8-18-54	X		
N. G. Wittenbrock to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on high pressure, high temperature pumps	C. B. Graham	8-19-54	8-19-54	X		

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Restricted Data
Class. Unclass. Areas

DECLASSIFIED

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Class.</u>	<u>Unclass.</u>	<u>Areas</u>
D. G. Worlton to: National Lead Company Fernald, Ohio	Consultation on electronic equipment	J. T. Scheuer W. Ingram	8-31-54	9-8-54	X		
P. D. Wright to: Bridgeport Brass Co. Adrian, Michigan	Observe fabrication of uranium	R. M. Treco	8-30-54	9-3-54	X		
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
J. W. Morris E. I. du Pont de Nemours & Co. Wilmington, Delaware	Discuss technical process details of analytical loads	C. A. Priode T. W. Hauff W. N. Mobley V. R. Chapman	8-16-54	8-20-54	X		200-E XXX 200-W 221-T, 221-U Redox 300-L 303; 700
V. R. Thayer E. I. du Pont de Nemours & Co. Wilmington, Delaware	Discuss problems on separations facilities and mint with regard to processes for Savannah River	C. A. Priode T. W. Hauff W. N. Mobley V. R. Chapman	8-16-54	8-20-54	X		200-W 221-T, 221-U Redox 300-L 303; 700
II. Visits to other Installations							
S. M. Gill to: National Lead Company Fernald, Ohio	Discuss quality control of uranium slugs	C. H. Walden	8-9-54	8-12-54	X		
S. M. Gill to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Survey uranium processing	W. M. Leaders	8-13-54	8-13-54	X		
L. M. Knights to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Discuss need for plutonium assay monitoring program	C. A. Metz	8-19-54	8-19-54	X		
W. M. Mathis to: Bridgeport Brass Co. Adrian, Michigan	Discuss fuel element technology	R. M. Treco	8-31-54	9-1-54	X		

<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class. Unclass. Areas</u>
J. D. Orton to: Aircraft Nuclear Propulsion Cincinnati, Ohio Project	Discuss physics aspects of proposed job	L. F. Hardy	8-2-54	8-4-54	X
RADIOLOGICAL SCIENCES DEPARTMENT					
I. Visitors to this Works					
U. S. G. Kuhn, III University of Tennessee Knoxville, Tennessee	Exposure of biological animals and specimens	H. A. Kornberg C. M. Barnes	8-6-54	8-6-54	X 100-F 108-F
B. F. Trum University of Tennessee Knoxville, Tennessee	Exposure of biological materials	C. M. Barnes	8-18-54	8-20-54	X 100-F 108-F
A. Wolff Sanitary Eng. Center Cincinnati, Ohio	Discuss item 131 veterinary studies	C. M. Barnes	8-27-54	8-27-54	X 100-F 108-F
W. J. Morris E. I. du Pont de Nemours & Co. Wilmington, Delaware	Discuss radistion protection and radio- chemical laboratories	J. M. Smith, Jr.	8-19-54	8-19-54	X 300 XXX
MANAGEMENT					
I. Visitors to this Works					
W. A. Conwell Duquesne Light Company Cincinnati, Ohio	Obtain information of value in connection with FWR.	W. E. Johnson A. B. Greninger	8-19-54	8-19-54	X 200-E XXX 200-W Redox 100-B 105-C 300-L 303; 700
H. G. Frus Duquesne Light Company Cincinnati, Ohio	Obtain information of value in connection with FWR.	W. E. Johnson A. B. Greninger	8-19-54	8-19-54	X 200-E XXX 200-W Redox 100-B 105-C 300-L 303; 700

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<u>Name - Organization</u>	<u>Purpose of Visit</u>	<u>Person Contacted</u>	<u>Arrival</u>	<u>Departure</u>	<u>Restricted Data Class.</u>	<u>Unclass.</u>	<u>Areas</u>
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SPECIAL STUDIES

I. Visits to Other Installations

W. J. DOWIS to: U. S. Atomic Energy Comm. data Washington, D. C.	Cost and engineering	D. Herron, AEC M. B. Kratzner, AEC	8-25-54	8-27-54		X	
K. L. ROBERTSON to: U. S. Atomic Energy Comm. data Washington, D. C.	Cost and engineering	D. Herron, AEC M. B. Kratzner, AEC	8-25-54	8-27-54		X	

PLANT AUXILIARY OPERATIONS DEPARTMENT - OPERATIONS ANALYSIS SECTION

I. Visits to other Installations

L. W. SMITH to: Radiation Laboratory Berkeley, California	Discuss computing facilities and computer	B. Fernbach	8-19-54	8-19-54		X	
L. W. SMITH to: Rand Corporation Santa Monica, California	Discuss computing facilities and computer	D. J. Madden W. Orchard-Hays	8-20-54	8-20-54		X	

PLANT AUXILIARY OPERATIONS DEPARTMENT - TELEPHONE SECTION

I. Visits to other Installations

G. R. MCKINNEY to: U. S. Atomic Energy Comm. telephone communications Idaho Falls, Idaho	Confer on radio and telephone communications	F. E. Smith	8-17-54	8-20-54		X	
E. S. STAPLES to: U. S. Atomic Energy Comm. telephone communications Idaho Falls, Idaho	Confer on radio and telephone communications	F. E. Smith	8-17-54	8-20-54		X	

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PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY AUGUST 1954

STATISTICAL AND GENERAL

Engineered items, to be installed by a lump sum contractor, are being procured for the Purex Tank Farm on Project CA-513-A. Shipping dates are being given to Engineering as soon as awards are made so that this information can be included in the Commission's contract with the contractor.

As a result of several vendors extending their delivery promises on material for Project CA-514, expeditors have been put into the field to expedite in the vendors' plants.

During the month, an estimate was furnished by Manufacturing of projected requirements for Essential Materials by the Separations Section, indicating substantially increased quantities and accelerated delivery rates. Market studies are in progress to determine that all requirements can be met, to identify possible difficulties and allow sufficient time to alleviate same.

Present stocks and delivery rates of fabricated aluminum items for Metal Preparation Section appear to be adequate and the inventory picture in good shape. Further design changes may alter this situation, although it is felt that present supply sources are sufficiently experienced to meet our requirements.

As a result of our proposal, the rail carriers have published reduced rates to apply on Chlorine in thirty and fifty-five ton cars from coast points to the project which will effect a savings of approximately \$104.00 per car.

Agreement has been reached regarding the reporting of Spare Parts inventories as requested by the AEC and as established in Mr. K. D. Nichlos' Washington Report of July 2, 1954. A review of Spare Parts records will be made and items will be segregated into four classifications.

In order to prepare for the scheduled public auction of excess material, it was necessary to close the surplus yard to incoming material on Aug. 23, 1954. The lotting of material for this sale is making good progress and record controls and paper work are keeping pace.

On January 25, 1954 back orders (store orders) on hand for General Supplies material totaled 2028. As of August 30, 1954 there were 226 back orders on hand or a reduction of 1802 from the January figure and 110 from the number on hand as of July 30, 1954. These 226 back orders cover 157 line items which represent .9% of the 18,300 items in this account.

During August material and equipment valued at \$71,000 were withdrawn from Excess accounts for use on the Project.

<u>Organization and Personnel</u>	<u>7-31-54</u>	<u>8-31-54</u>	<u>Change</u>
Employees on Roll	293	287	-6

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
AUGUST 1954

The following table shows the net dollar value of business, by cost category, and the number of procurement actions placed with different types of vendors.

<u>AUGUST 1954</u>	<u>Government Agency</u>	<u>Small Business</u>	<u>Big Business</u>	<u>Educational and Other</u>
\$0 - \$ 24.99	\$ 32.00	\$ 58.15 Cr.	\$ 2,544.49	\$ 28.50
\$25 - \$ 499.99	839.50	111,070.36	65,025.53	25.10
\$500 - \$ 24,999.00	4,798.92	378,213.03	242,214.29	-
\$25,000 - \$ Up .	-	68,460.00	857,371.00	-
	<u>\$ 5,670.42</u>	<u>\$ 557,685.24</u>	<u>\$1,167,155.31</u>	<u>\$ 53.60</u>
Number of Actions	11	1555	843	4

Vendor Contacts	278
Claims Processed	0
Damage Reports Processed	4
Over & Short Reports Processed	5
Accounts Payable Requests Handled	355
Difference Slips Processed	92
Clearance Slips & Purchase Order Change Approvals	324
Material Exception Reports	318
Return Orders Issued	172

The following is a tabulation of the activity in our utilization of Off-Plant Excess Material and Equipment Program for August, 1954.

	<u>Items Processed</u>	<u>Items Received</u>	<u>*Value of Items Rec'd</u>	<u>** Cost of Items Rec'd</u>	<u>Savings to H.A.P.O.</u>
	275	13	\$115,005.89	\$58,288.70	\$56,717.19
<u>Previous Balance</u>	2422	434	\$ 13,732.66	\$ 5,560.47	\$ 8,172.19
<u>Combined Totals</u>	2697	447	\$128,738.55	\$ 63,849.17	\$64,889.38

* Acquisition cost or market value - whichever is lower.
** Includes packing and freight, where applicable.

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT

Requisitions on hand 8-1-54	<u>G</u>	<u>D</u>	<u>Total</u>	
Operations Procurement	749	0	749	
Construction Procurement	0	170	170	
A.E.C. Procurement	<u>161</u>	<u>48</u>	<u>209</u>	
Total	910	218	1128	
Requisitions Assigned during August				
Operations Procurement	1772	0	1772	
Construction Procurement	0	534	534	
A.E.C. Procurement	<u>386</u>	<u>108</u>	<u>494</u>	
Total	2158	642	2800	
Requisitions Placed during August				
Operations Procurement	1858	0	1858	
Construction Procurement	0	527	527	
A.E.C. Procurement	<u>327</u>	<u>68</u>	<u>395</u>	
Total	2185	595	2780	
Requisitions on hand 8-31-54				
Operations Procurement	663	0	663	
Construction Procurement	0	177	177	
A.E.C. Procurement	<u>220</u>	<u>88</u>	<u>308</u>	
Total	883	265	1148	
Purchase Orders Placed	<u>HW</u>	<u>HWC</u>	<u>Total</u>	
Operations Procurement	1678		1678	
Essential Material	37		37	
Construction Procurement		527	527	
Local Purchase	<u>13</u>	<u>3</u>	<u>16</u>	
Total	1728	530	2258	
Value of Orders Placed				
Operations Procurement	\$ 651,909.52		\$ 651,909.52	
Essential Material	935,004.78		935,004.78	
Construction Procurement		219,414.34	219,414.34	
Local Purchase	<u>123.97</u>	<u>17.68</u>	<u>141.65</u>	
Total	\$ 1,587,038.27	\$ 219,432.02	\$ 1,806,470.29	
Alterations Issued	<u>Increase</u>	<u>Decrease</u>	<u>No Change</u>	<u>Total</u>
HW Operations	57	46	12	115
Essential Material	2	2	1	5
HWC Construction	<u>27</u>	<u>18</u>	<u>9</u>	<u>54</u>
Total	86	66	22	174
Value of Alterations Issued	<u>Increase</u>	<u>Decrease</u>		<u>Total</u>
HW Operations	\$10,389.85	\$ 6,611.40		\$ 17,001.25
Essential Material	5,252.13	87,057.27		92,309.40
HWC Construction	<u>7,575.58</u>	<u>5,612.06</u>		<u>13,187.64</u>
Total	\$23,217.56	\$99,280.73		\$122,498.29
Government Transfers	<u>OR</u>	<u>ORC</u>		
	C	0		
Organization and Personnel	<u>7-31-54</u>	<u>8-31-54</u>	<u>Change</u>	
Employees on Roll	1203754 <u>21</u>	<u>21</u>	<u>0</u>	

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
AUGUST, 1954

We have been requested to procure Engineered items for the Purex Tank Farm, which will be installed by a Lump Sum Contractor. These items are covered by 14 requisitions and charged to Project CA-513-A, Cost Code 5311. Shipping dates are being given to Engineering as soon as awards are made on these requisitions in order that this information can be included in the Atomic Energy Commission's contract with the Lump Sum Contractor.

Purchase requisitions are being received for material to be used in the Hanford LX program. At the present time this program has been broken down into five major parts:

"B" Plant	Cost Code 0041
UO ³ Plant	Cost Code 0042
300 Area	Cost Code 0043
100 Area	Cost Code 0599
"T" Plant	Cost Code 0603

Each of the above Cost Codes will be handled and expedited as a separate unit.

Several vendors furnishing material for Project CA-514 have extended their delivery promises. As this material is urgently needed, Expeditors have been put in the field to expedite in the vendors' plants. As a large percentage of the orders are in the Puget Sound Area, one Expediter is spending all of his time in that location. Several orders were placed in the Eastern part of the United States and one Expediter is on a trip East to assist in speeding up shipment on these orders.

Requisitions have been received for the new 220 K. V., 31,250 K.V.A. power transformer and for radiators and fans to increase the rating of existing power transformers to be used on Project CG-558. These are long delivery items and have been referred to the Atomic Energy Commission for procurement.

The following figures depict the work load trend of this Unit:

	1954						%
	Apr.	May	June	July	Average	Aug.	Change
Requisitions assigned	550	549	599	492	548	534	-3
Requisitions placed	488	556	587	578	552	527	-4
Requisitions on hand	251	244	256	170	230	177	-23
Purchase Orders expedited (Avg.)	-	-	791	654	723	625	-14
<u>Organization and Personnel</u>		<u>7-31-54</u>		<u>8-31-54</u>		<u>Change</u>	
Employees on Roll		27		28		#1	

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
AUGUST -- 1954

Statistical and General

During the month, an estimate was furnished by Manufacturing of projected requirements for Essential Materials by the Separations Section, indicating substantially increased quantities and accelerated delivery rates. Market studies are in progress to determine that all requirements can be met, to identify possible difficulties and allow sufficient time to alleviate same.

Present stocks and delivery rates of fabricated aluminum items for Metal Preparation Section appear to be adequate and the inventory picture in good shape. Further design changes may alter this situation, although it is felt that present supply sources are sufficiently experienced to meet our requirements.

Essential Materials Contracts

1. Aluminum Nitrate Nonahydrate -- with the Commission for signature.
2. Nitric Acid -- General Chemical Division, Allied Chemical and Dye. Negotiations are still in progress regarding the 13-month extension requested by the Commission. A proposal has been received which requires clarification and further discussion. This negotiation should be concluded during the month of September.
3. Tributyl Phosphate -- supplemental contract completed and in force.
4. Liquid Carbon Dioxide -- supplemental contract completed and in force. A new contract has been written and submitted for approval.
5. Caustic Soda -- supplemental contracts being prepared.
6. Steam Coal -- Preparation of contracts, which was delayed by the Independent Coal and Coke Company protest consideration, has been completed and the contracts submitted for approval.
7. Sulfamic Acid -- contract being prepared.
8. Ferrous Ammonium Sulphate -- contract prepared and sent to the vendor for signature.

Organization and Personnel

	<u>7-31-54</u>	<u>8-31-54</u>	<u>Change</u>
Employees on Roll	36	35	-1

PURCHASING AND STORES SECTION

STORES UNIT

AUGUST 1954

STATISTICAL AND GENERAL

The move of Spare Parts from 200-W Area to the 2101-E Building is progressing satisfactorily. Some palletized material and all bin material remain in the 200-W Warehouse pending the arrival and installation of bins and pallet racks for the 2101-E Building scheduled for the latter part of September.

Blaw-Knox is holding a large number of operational spare parts for Purex and is anxious to transfer them to General Electric as they have inadequate warehousing. The transfer will begin October 1, 1954 upon the completion of installing bins and pallet racks in the 2101-E Building.

Agreement has been reached regarding the reporting of Spare Parts inventories as requested by the AEC and as established in Mr. K. D. Nichols' Washington Report of July 2, 1954. A review of Spare Parts records will be made and items will be segregated into four classifications. A definite schedule for completing this program has not been established, but it will be accomplished as soon as practical.

In order to prepare for the scheduled public auction of excess material, it was necessary to close the surplus yard to incoming material on Aug. 23, 1954. The lotting of material for this sale is making good progress and record controls and paper work are keeping pace. Approximately 7,000 line items were physically moved into a sales location.

Preparations for the physical inventory of General Supplies is progressing according to schedule.

On January 25, 1954 back orders (store orders) on hand for General Supplies material totaled 2028. As of August 30, 1954 there were 226 back orders on hand or a reduction of 1802 from the January figure and 110 from the number on hand as of July 30, 1954. These 226 back orders cover 157 line items which represent .9% of the 18,300 items in this account.

Three classes of material in the General Supplies account have been completely changed to the new commodity classifications: Caption 27-Floor covering, Caption 42-General Hardware, and Caption 59-Building Materials.

In the Excess Material and Equipment Accounts the following items are reported:

Disbursements by store order	\$ 70,444
Transfers to inventories	621
Offsite shipments	67,964
Receipts	287,096

<u>Organization and Personnel</u>	<u>7-31-54</u>	<u>8-31-54</u>	<u>Change</u>
Employees on Roll	196	190	-6

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PURCHASING & STORES SECTION

TRAFFIC UNIT

August, 1954

STATISTICAL AND GENERAL

As a result of our proposal, the rail carriers have published reduced rates to apply on Chlorine in thirty and fifty-five ton cars from coast points to the project which will effect a savings of approximately \$104.00 per car.

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 \$1,557.94. This makes a total savings from September 1, 1946, to date of \$1,772,546.16.

Savings Report

1. Rate reductions obtained from carriers:

<u>Commodity</u>	<u>Origin</u>	<u>Savings for August, 1954</u>	<u>Savings from 9-1-46 thru July, 1954</u>	<u>Savings from 9-1-46 to date</u>
Aluminum Sulphate (Liquid)	Portland, Ore.	\$1,053.94		
Aluminum Extrusions	Edgewater, N.J.	504.00		
		<u>\$1,557.94</u>	<u>\$1,770,988.22</u>	<u>\$1,772,546.16</u>
2. Freight Bill Audit		2,184.88	127,247.87	129,432.75
3. Loss & Damage & Overcharge Claims		265.83	138,582.94	138,848.77
4. Ticket Refund Claims		1,013.40	40,734.88	41,748.28
5. Household Goods Claims		-	<u>17,641.85</u>	<u>17,641.85</u>
		<u>\$5,022.05</u>	<u>\$2,095,195.76</u>	<u>\$2,100,217.81</u>

Work Volume Report

Completed Travel Requests		137
Reservations resulting from above:	Rail	39
	Air	203
	Hotel	164
Expense Accounts Checked		228
Household Goods & Automobiles	Movements Arranged Inbound	8
	Movements Arranged Outbound	1
	Insurance Riders Issued	6
	Insurance Bills Approved	2

PURCHASING & STORES SECTION
TRAFFIC UNIT
 August, 1954

Work Volume Report (cont.)

Ticket Refund Claims	Filed	15
	Collected - Number	16
	Collected - Amount	\$1,013.40
Freight Claims	Filed	10
	Collected - Number	6
	Collected - Amount	\$265.83
	Over and Shorts Processed	14
	Damage Reports Processed	8
Freight Bill Audit Savings		\$2,184.88
Freight Shipments Traced		36
Quotations	Freight Rates	224
	Routes	219
Bills Approved	Air Freight	4
	Air Express	16
	Boat	2
	Carloading	176
	Express	194
	Rail	809
	Truck	291
Carload Shipments	Inbound	999
	Outbound	1

Report of Carloads Received

<u>Commodity</u>	<u>CMSTP&P</u>	<u>NP</u>	<u>UP</u>	<u>TOTAL</u>
Aluminum Sulfate (Liquid)	4	2	3	9
Aluminum Extrusions			1	1
Aluminum Sulfate (Dry)	2	4	2	8
Asphalt	1			1
Building & Roofing Material		1		1
Caustic Soda	22	21	19	62
Chlorine	3	3	2	8
Coal			1	1
Coal	296	141	407	844
Drums, Iron or Steel		1	1	2
Furnaces	1			1
Infusorial Earth		1		1
Lime			1	1
Limerock	1			1
Machinery		4	1	5
Methyl Isobutyl Ketone			3	3
Mixing Machine		1		1
Naphtha	3			3
Nitric Acid		8	15	23

PURCHASING & STORES SECTION
TRAFFIC UNIT
 August, 1954

Report of Carloads Received (cont.)

<u>Commodity</u>	<u>CMSTP&P</u>	<u>NP</u>	<u>UP</u>	<u>TOTAL</u>
Oxalic Acid	1			1
Pallets	1	1		2
Phosphoric Acid		2	1	3
Pipe, Wrought			1	1
Plaster			1	1
Salt		2		2
Shovel Boom			1	1
Silicate of Soda	1		1	2
Soda Ash	1	1	1	3
Sodium Nitrate		2		2
Sulphuric Acid	1		1	2
Towers			1	1
Trichlorethylene	1	1		2
Misc. & Stop Cars	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	339	196	464	999
 <u>Organization & Personnel</u>	 <u>7-31-54</u>	 <u>8-31-54</u>	 <u>Change</u>	
	9	9	0	

[REDACTED]

TRANSPORTATION SECTION
MONTHLY REPORT
August 1954

DECLASSIFIED

Transportation Section personnel forces remained at 492 with four new hires two reactivations - personal illness, three terminations, two transfers out, and one deactivation - personal illness.

Construction of the new Consolidated Transportation Facility progressed from 88% on July 23 to 97% on August 26. Average employment during the month has been 87. Partial occupancy is now anticipated about October 15 with complete occupancy by November 8.

Furnished data to the Atomic Energy Commission on the Plant and Community Bus Systems for FY 1954 back through FY 1950 as to gross operating costs, revenue, and net operating costs.

Co-operated with the General Cost Unit in establishing a system of account classification codes to be used by IBM in segregating and accumulating maintenance costs for each class and type of HO equipment. In addition to serving general informational needs, data will be readily accessible for comparison with rental rates to determine their appropriateness and facilitate revisions where required.

Representatives of the Transportation Section met with representatives of the Cost and Budgets Section on August 16 to discuss expenditures connected with new and upgraded replacement equipment. Expenditures were classified as to types and procedures developed for the accumulation, liquidation, and reporting of such costs.

The physical inventory of railroad materials (0410-85) disclosed an overage of \$1,759 which is being credited to 9251-259. The overage resulted from material charged out of inventory to expense and not being completely used; and material removed from the railroad and placed in inventory stock without processing the necessary debit and credit entries. Representatives of the Inventory Accounting Unit and the Transportation Section are to meet on Monday August 30 to finalize the formal report.

Co-operated with the Inventory Accounting Unit in scheduling physical inventories for the remainder of calendar year 1954. Road materials will be inventoried in October with repair parts and antifreeze being scheduled for December.

Completed the annual physical inventory of automotive and construction equipment for which the Transportation Section has property management responsibility. The first phase of the inventory was conducted between June 12 and June 30 with all units being checked and accounted for except 26 pieces of construction equipment. Subsequent checks reduced the unaccounted-for units to seven. Property Disposal Requests have been prepared on six of the seven units. The one remaining unit will be retained on record for one year as it is believed to be on-plant even though it has not been located.

[REDACTED]

Transportation Section

Fifty-six pickup trucks, three panel trucks, and four carryalls were received during August as replacement equipment. The Atomic Energy Commission has requested that 25 of the replaced pickups be excessed by September 17 so they can be sold at the auction on October 11.

Effective August 16, lunch periods for Bus Drivers were revised on certain shift schedules permitting driving assignments up to and including "to home" shuttles. The later lunch periods are at a comparatively quiet time.

Commercial rail traffic during August increased by 761 cars or 70.2% over July due to the resumption of coal receipts following the annual coal miners' holiday. Coal receipts have been somewhat slow in getting underway and will not reach the expected level until September. Other materials continued at normal volumes. The following recapitulation indicates the distribution of commercial cars handled:

<u>Carload Movements</u>	<u>-</u>	<u>Loads In</u>	<u>Empties In</u>	<u>Loads Out</u>	<u>Empties Out</u>
General Electric Company		793	18	15	751
A.E.C.		73	0	0	58
A.E.C. Kaiser (cement)		12	0	0	12
Blaw-Knox		22	0	0	23
Bumstead & Wolford		1	0	0	1
Gasland Construction Co.		5	0	0	5
L. H. Hoffman		1	0	0	1
L. A. Hopkins		3	0	0	3
Kaiser Engineers		5	0	0	4
Sound Construction Co.		1	0	0	6
U. S. Army		<u>16</u>	<u>0</u>	<u>0</u>	<u>16</u>
		932	18	15	880

Railroad process service during August increased by 35 cars or 45.5% over July as the Redox Facility was in continuous operation throughout the month.

Total car movements including process service totaled 2,293 in August compared to 1,361 in July, 2,667 in June, 3,110 in May, 2,267 in April, 2,482 in March, 2,624 in February, and 2,545 in January.

Modification of well car 10B-3642 to accommodate a third cask has been completed. All ten of these cars have now been modified and returned to regular service.

Necessary piping to by-pass the low water tank at Riverland has been installed. This tank is being excessed since it is in poor condition and no longer required. The boiler at Riverland including piping, steam lines, and fittings, has been sold and removed except for final cleanup by the purchaser.

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Transportation Section

Emergency track repairs to the main line between stations Ethel and Pearl were performed on August 16 at a cost of \$112.91. Rails and ties had been raised out of the ballast by a bulldozer being operated by construction personnel.

The Plant Bus System transported 12.4% more passengers in August than in July. The following statistics indicate the magnitude of service rendered:

Passenger volume	144,711
Revenue - bus fares	\$ 7,235.55
Earnings - transit advertising (July)	\$ 102.01
Bus trips	6,776
Bus miles - passenger carrying	188,691
Passenger miles	4,717,885

Minor revisions in routes and schedules will be necessitated by the forthcoming move to the new Consolidated Transportation Facility. Schedules and route maps are being prepared to depict these changes.

The Richland Bus System transported 13% more passengers in August than in July. The following statistics indicate the volume of service rendered:

Total passengers including transfers	7,973
Revenue - bus fares	\$ 586.02
Earnings - transit advertising (July)	\$ 4.64
Bus trips	1,239
Bus miles - passenger carrying	6,567
Passenger miles	27,882

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 103 which were rendered to the following locations as indicated:

Benton City, Washington	9
Grandview, Washington	2
Hinkle, Oregon	9
Kennewick, Washington	14
Pasco, Washington	40
Pendleton, Oregon	5
Prosser, Washington	3
Spokane, Washington	2
Sunnyside, Washington	2
Walla Walla, Washington	4
West Richland, Washington	6
Yakima, Washington	7

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Transportation Section

The following tabulation indicates in gallons the volume of fuel distribution during August:

	<u>Gasoline</u>	<u>Diesel Fuel</u>	<u>50 Cetane</u>	<u>Kerosene</u>	<u>White Gas</u>
Stock at start of month	30,945	24,690	9,000	2,227	313
Received during month	93,290	25,800	24,400	822	0
Dispensed during month	90,660	20,785	25,400	1,304	93
Stock at end of month	33,575	29,705	8,000	1,745	220

The following tabulation indicates the volume of equipment maintenance activities during August by type of service and number of jobs:

Motor Overhauls	51
Class A Inspections and Repairs	119
Class B Inspections and Lubrications	995
Weekly Inspections - Fuel Trucks and Off-Plant Vehicles	65
Semi-monthly Inspections - Buses	164
Monthly Inspections - Railroad Rolling Stock	2
Other Routine Maintenance Repairs and Service Calls	2,438
Accident Repairs and Paint Jobs	38
Tire Repairs	500
Wash Jobs	<u>536</u>
	4,908

The following tabulation indicates the number of HO mileage vehicles in service during July and the utilization of each type:

<u>Code</u>	<u>Type</u>	<u>No. of Units</u>	<u>Total Mileage</u>
1A	Sedans	416	604,895
1B	Buses	97	228,527
1C	Pickup Trucks	410	246,972
1D	Panel, Carryall, Sta. Wagon	165	160,570
1G	Jeeps	2	1,101
1H	Power Wagons	50	26,240
1J	Armored Cars	2	36
68 Series	Trucks	<u>222</u>	<u>95,553</u>
		1,364	1,363,894

Thirty-four units of HO equipment were cleaned by the decontamination center in the 200-West Area during August and released by the Radiation Monitoring Sub-Section.

Roadside cleanup in the 600 Area has been completed from Hanford to the 100-H Area. Refuse and other undesirable materials have been buried or congregated for burning as weather permits. Approximately twenty-five abandoned wells have been backfilled thereby eliminating a serious safety hazard.

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Transportation Section

Material handling personnel have been furnished to the Stores Unit on a stepped up basis including overtime on August 28 and 29 (Saturday and Sunday) to prepare excess materials for the auction to be conducted on October 11 and 12.

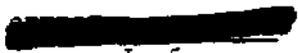
Maintenance of primary roads required 368 man-hours; secondary roads 16 man-hours; patrol roads and trails 32 man-hours; walkways, parking facilities and related ground maintenance in the manufacturing areas required 432 man-hours. Seal coating of 3.6 miles of Plant roads outside of the manufacturing areas required 405 man-hours.

The following tabulation indicates in tons the volume of asphaltic material handled in August for road maintenance:

	<u>MC 3</u>	<u>MC 5</u>
Stock at start of month	17.88	0
Received during month	76.52	77.18
Used during month	44.00	72.78
Stock at end of month	50.40	4.40

The following tabulation indicates the volume of mineral aggregate and pre-mix materials handled in July for road maintenance:

	<u>3/4" to 0 Pre-mix Tons</u>	<u>1/2" to 0 Pre-mix Tons</u>	<u>5/8" Chips Cu.Yd.</u>	<u>1/4" Chips Cu.Yd.</u>	<u>3/4" Crushed Rock Cu.Yd.</u>
Stock at start of month	578	541.5	1,253	3,043	1,804
Made during month	726	226	0	0	0
Used during month	702	385.5	560	1,089	562
Stock at end of month	602	382	693	1,954	1,242



TELEPHONE SECTION
MONTHLY REPORT FOR AUGUST 1954

GENERAL

Construction of the new Official Telephone exchange, Project CA-533, by the Lewis A. Hopkins Company, was 38% completed at the end of the month according to AEC estimate.

In the 100KBC exchange being installed in the 100K area, the main distributing frame has been installed to date. No other equipment has been received.

In July, AEC approval was requested for having the next three editions of the official telephone directory printed by the General Telephone Directory Company through modification of an existing agreement for publishing the Richland directory. This request was disapproved and it was suggested that we advertise for bids on the printing job. It is estimated that this will delay distribution approximately 4 weeks beyond the original planned date of October 20th.

Authorization was received from the AEC to gas pressurize 63 miles of telephone trunk cable in connection with an informal request (I.R.-155) initiated by the Commission.

During the month, remaining equipment needed to complete the installation of an emergency generator to serve Auxiliary Civil Defense Control Center Communications was received and installed.

Operating experience during the past month with the new Richland Police radio communications system has disclosed the necessity for raising the elevation of the main station antenna on top of the 703 building to secure completely satisfactory coverage of the entire area covered by Richland Police activities. A supporting tower approximately 75 feet high will be installed on the roof of the 5th wing of the 703 building to support 2 antennas.

A work order in the amount of \$16,000 was received from the Engineering Department to cover the cost of all tie-in work to be performed by the Telephone Section in connection with the installation of the new Official Telephone exchange.

On August 23rd, Telephone Section personnel participated in the state-wide Civil Defense exercise, "Operation Flood-Out".

E. S. Staples and G. R. McKinney visited the National Reactor Testing Station at Idaho Falls, Idaho, on the 18th and 19th to confer with communications personnel of the Phillips Petroleum Company, contract operators of the radio and telephone systems at that project.

During the month, Telephone Section engineer and supervisor employees assisted the Plant Accounting Unit in their program of establishing the "FCC Uniform System of Accounts" for the Commercial Telephone facilities.

Further discussion with AEC Financial people resulted in obtaining their concurrence that the GE General Cost Unit of the Financial Department could be furnished monthly reports of the telephone revenues collected directly by the AEC. R. L. Warburton is investigating the possibility of utilizing the AEC revenue information so that it will be reflected in his monthly report of Commercial Telephone System operations

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GENERAL (Continued)

Two non-exempt employees of the Section were selected during the month to fill vacancies for telephone foremen.

On August 13th, the AEC awarded a contract to Anderson and Torreta for the installation of two direct-burial telephone cables in the vicinity of the 100K area. One of the cables will furnish trunk connections to the 100KBC dial exchange now being installed and the other cable will serve all 100B&C area telephones from the 100KBC exchange.

PLANT TELEPHONE OPERATIONS

A 100-line PBX switchboard to serve the Central Stores Unit was installed and put into service on August 16th.

Installation of a test board in the 300 area exchange was completed.

Preventive maintenance work on the alternate route trunk cable between the 300 area and the 200EW exchange, started some weeks ago, was 95% completed at the end of the month.

At the request of Kaiser Engineers, 18 dial telephone lines and 40 telephone instruments were removed from service in the White Bluffs central shops area.

Furnished the AEC with recommendations for a change in the connecting point with U.S. Army telephone circuits serving the firing range near the 300 area.

Telephone representatives conferred with representatives of the Richland Police Unit to discuss the advisability of installing a PBX switchboard at Police headquarters to handle all police telephone traffic. A subsequent traffic study resulted in an agreement to install a small PBX board equipped for 12 stations and 5 central office trunks.

Telephone Section representatives inspected and approved the modifications made to the BY telephone building in connection with Project CA-512-R; the work consisting primarily in rearrangement of interior partitions and the installation of a new air conditioning unit to serve the enlarged equipment room.

COMMERCIAL TELEPHONE OPERATIONS

Inspected and repaired damage to a 909-pair cable on Stevens Drive near the Catholic Church. Damage was done by a back-hoe machine owned and operated by the E. A. Robertson Company, Kennewick contracting firm.

Consulted with city building inspector regarding telephone connections to new commercial buildings.

Improving modifications were made to the 440-volt power supply transfer equipment in the Richland exchange to obtain more positive indication of existence of regular and emergency voltages.

Completed transfer of Civil Defense siren control circuits from open wire and drop wire back of Sanford Avenue to new and reliable open wire construction along Thayer Drive north to Duportail.

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COMMERCIAL TELEPHONE OPERATIONS (Continued)

Established a new procedure for repairing telephone cable terminals that will result in the salvage of some cable terminals that would otherwise be useless for further service.

Commenced taking inventories of outside telephone Plant in Richland to aid Plant Accounting Unit in their program for application of the "FCC Uniform System of Accounts".

RADIO SYSTEM OPERATIONS

G. R. McKinney conferred with R. B. McGahee of the Transportation Section on plans to move the railroad dispatching radio control equipment from Riverland to the new dispatching office in the 3000 area and furnished estimate of the cost of installing a radio station in the roundhouse office at Riverland.

In addition to the normal routine maintenance of all radio equipment on the plant, the following additional jobs were performed: Seven mobile transmitter-receiver sets were removed from automobiles and reinstalled in other vehicles. Also, special public address equipment was temporarily installed in the Desert Inn for Mr. Johnson's August 3, 1954 meeting. Assembled radio receiving and tape-recording equipment in a cabinet-type rack for the Audio-Visual Unit.

Tested all radio equipment in the mobile Civil Defense Control Center prior to the Civil Defense exercise, "Operation Flood-Out".

OVERTIME

	<u>Exempt</u>	<u>Non-Exempt</u>
Total Manhours Budgeted	40	280.0
Emergency Telephone Maintenance		2.0
Emergency Radio Maintenance		9.1
Emergency Shift Coverage		11.3
Planned Telephone Moves	8	24.0
Planned Telephone Maintenance		.6
Planned Radio Work		.2
Business Office Clerical Work		16.0
Directory Preparation	8	32.0
	<u>16</u>	<u>95.2</u>
TOTAL		111.2

The total actual overtime worked is considerably less than the budgeted time for the following reasons: Emergency shift coverage was much less than expected. No coverage of Business Office vacations was necessary and planned telephone moves was much lighter than expected.

ABSENTEEISM

	<u>Mandays</u>	
	<u>Exempt</u>	<u>Non-Exempt</u>
Scheduled to Work	242	1430
Absent Due to Personal Illness		288.0
Absent for All Other Reasons		80.7
TOTAL ABSENCE		<u>368.7</u>

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ABSENTEEISM (Continued)

Percent Female Absenteeism	3.75%
Percent Male Absenteeism	2.3 %
Percent Total Absenteeism	2.75%

PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
General Unit	1	1
Radio Unit	1	4
Plant Telephone Unit	4	25
Commercial Telephone Unit	3	15
Business Office	1	5
Operations Unit	1	15
	<u>11</u>	<u>65</u>
TOTAL		76

The temporary reduction in 1 exempt employee was due to resignation of Paul R. Baldinger on July 31. Position will be filled in September.

STATISTICAL DATA

	<u>At 20th of August</u>	<u>Change from Previous Month</u>	<u>Change from Year Ago</u>
Residential Subscribers	6062	- 1	/410
Business Subscribers	483	- 1	/ 3
Paystation Telephones	67	- 1	/ 2
Official Subscribers:			
Richland Exchange	995	- 4	/ 23
North Richland Exchange	261	- 1	/ 6
Process Area Exchanges	1812	-16	/187

New Service Requests Received During the Month:

For Residential Service	95
For Business Service	6
TOTAL	<u>101</u>

Backlog of Service Requests:

For New Residential Telephones	236	<u>TOTAL</u>
For New Business Telephones	2	238
For Residential Outside Moves	29	
For Business Outside Moves	1	30

Service Orders Processed:

In Connection with Residential and Business Service	417
In Connection with Official Service	484
TOTAL	<u>901</u>

STATISTICAL DATA (Continued)

Facilities - Installed, In Service and Available:

	Exchange Lines			Party Lines Available
	Installed	In Service	Available	
Richland	4050	3991	59	347
North Richland	600	512	88	67
Process Areas	2050	1718	332	--
	<u>6700</u>	<u>6221</u>	<u>479</u>	<u>414</u>

Radio Stations:

	At 20th of August *	Change from Previous Month*	Change from Year Ago
Fixed Stations	35	0	79
Mobile Stations	149	- 1	76
	<u>184</u>	<u>- 1</u>	<u>155</u>

* The total for last month should have been same as shown for this month. Error was due to not counting all stations in Civil Defense control centers.

E. A. Staples
 Manager,
 TELEPHONE SECTION

ES Staples:pab

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September 3, 1954

ELECTRICAL UTILITY SECTION

MONTHLY REPORT

August, 1954

GENERAL

The Section's total work force of eighty-six on August 1 had increased to eighty-seven at month's end by the assignment of a replacement draftsman.

Plant Electrical Power Demand Statistics:

Probable Time of August Peak Demand . .	10:00 a.m.-11:00 a.m., August 11
Demand Peak for August	115,000
Comparative Demand Peak in July	114,943 KW
Billing Demand	116,767 KW
Date Billing Demand Est.	May 28

Overtime hours during the month were 2.7% of total hours worked, however, overtime hours instigated by Section needs were only 1.04% of total hours worked.

It is notable that the attendance of the Section was approximately 99.2% for the month.

The Electrical Utility Section was a major contributor to the 200-E Area injury reduction award for July. This is the third time 200-E Area has received this award during the past twelve months.

MAINTENANCE AND OPERATION

Relatively severe lightning storms occurred over the BPA System as well as locally during the month. Several surges on the 230 KV System were reflected to the HW System. One strike in 200-E Area destroyed lightning arrestors on a 2300 V circuit and put some 65 street and fence lights out of service. No production losses resulted.

On August 3, a desert fire just east of 212-R Area burned some scrap poles. Loss approximately \$15.00. The fire was apparently originated by a care-less smoker.

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SYSTEM EXPANSION AND PLANNING

- August 8, 12:45 p.m. The electrical power to 100-KW was cut-over from the temporary 66 KV testing station to the permanent 230 KV Station source.
- August 11 The newly installed transformers at the 313 Building Addition (CA-514) were energized.
- August 14 The primary disconnect switch and incoming cable was installed in the permanent position. This tie-in work was a deferred part of Project C-406.
- August 31 The second 230KV/13.8KV transformer in 151-KW was energized.

O Magee
ELECTRICAL UTILITY SECTION

O Magee:nlg

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POWER STATISTICS
ELECTRICAL UTILITY SECTION
FOR MONTH ENDING AUGUST 31, 1954

	ENERGY - MW HRS.		MAXIMUM DEMAND-KW		LOAD FACTOR-%	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	28720	30310	48700	49300	79.3	82.6
A-4 Out (100-D)	16160	16980	24700	24800	87.9	92.0
A-5 Out (100-E)	10760	9950	16200	16000	89.3	83.6
A-6 Out (100-F)	8960	8760	12700	13000	94.8	90.6
A-7 Out (100-K)	-	1488	-	15360	-	13.0
A-8 Out (200 Area)	5350	5780	9200	9500	78.2	81.8
TOTAL OUT	69950	73268	111500**	127960**	84.3	77.0
MIDWAY IN	70523	73940	108000*	123200*	87.8	80.6
115 KV System						
BB1S3 (Tie)	1647	1602	3195	3195*	69.3	67.4
Richland	7758	8136	16000*	17280*	65.2	63.3
BB3-S4 Out (300 Area)	1824	1984	3440	3840**	71.3	69.4
TOTAL OUT	11229	11722	22635**	24315**	66.7	64.8
66 KV System						
B9-S11 Out (100-K)	1650	1242	3000	3000	73.9	55.6
B7-S10 Out (W. Bluffs)	303	243	990	765	41.1	42.7
Hanford Out	28	25	300**	300**	12.5	11.2
TOTAL OUT	***1981	***1510	4290**	4065**	62.1	49.9
HANFORD IN	2375	1713(1)	11000*	10100*(2)	29.0	22.8
Project Total						
230 KV Out	69950	73268	111500**	127960**	84.3	77.0
115 KV Out	11229	11722	22635**	24315**	66.7	64.8
66 KV Out	1981	1510	4290**	4065**	62.1	49.9
TOTAL OUT	83160	86500	138425**	156340**	80.7	74.4
230 KV In	70523	73940	108000*	123200*	87.8	80.6
115 KV In	11229	11722	22635**	24315**	66.7	64.8
66 KV In	2375	1713	11000**	10100**	29.0	22.8
TOTAL IN	84127	87375	141635	157615	79.8	74.5

*Denotes Coincidental Demand Average Power Factor - 230 KV System 90.0
 **Denotes Non-Coincidental Demand
 ***Not adjusted for 100-K test power
 (1) Includes 154 MWH of 100-K test power
 (2) Hanford demand of 10,100 KW is estimated as 6300 KW test power and 3800 KW regular

Note: Test power metering was cut over from 66 KV (Hanford) to 230 KV source on August 7, 1954.

PLANT AUXILIARY OPERATIONS DEPARTMENT
OPERATIONS ANALYSIS SECTION

MONTHLY REPORT - AUGUST, 1954

Personnel Statistics

Following is the month end summary of personnel:

Operations Analysis Section

<u>Unit</u>	<u>As of 7-31-54</u>			<u>As of 8-31-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
General	1	1	2	1	1	2	0	0	0
Applied Mathematics	18	5	23	19	4	23	/1	-1	0
Computing	6	43	49	6	43	49	0	0	0
Graphics	1	14	15	1	15	16	0	/1	/1
Procedures	12	2	14	12	3	15	0	/1	/1
TOTAL	38	65	103	39	66	105	/1	/1	/2

Applied Mathematics Unit

	<u>As of 7-31-54</u>			<u>As of 8-31-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	2	3	1	2	3	0	0	0
Statistical Analysis	8	0	8	8	0	8	0	0	0
Mathematical Analysis	2	0	2	2	0	2	0	0	0
Numerical Analysis	7	3*	10	8	2*	10	/1	-1	0
TOTAL	18	5	23	19	4	23	/1	-1	0

* One rotational trainee.

D. O. Banks was placed on military leave on August 31, and P. M. Anselone returned from a leave of absence and was reactivated on August 30, both from the Mathematical Analysis group. F. J. Gruenberger was added to the roll effective August 31 as a member of the Numerical Analysis Function. One technical graduate was promoted to Junior Operations Analyst on August 1 and assigned to the Numerical Analysis Function. D. E. Gowan, of Numerical Analysis, resigned voluntarily on August 31 to attend Theological Seminary.

A trip was made by L. W. Smith on August 17-20 to the University of California Radiation Laboratory, Livermore, California, and to the Rand Corporation, Santa Monica, California, to investigate the availability of large computers and computer programs in connection with the Production Scheduling Operations Research Program.

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Computing Unit

	<u>As of 7-31-54</u>			<u>As of 8-31-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	0	1	1	0	1	0	0	0
Audit and Control	1	5	6	1	5	6	0	0	0
Key Punching	1	18	19	1	18	19	0	0	0
Machine Processing	3	20	23	3	20	23	0	0	0
TOTAL	6	43	49	6	43	49	0	0	0

One tabulating machine operator was hired during the month and one tabulating machine operator was transferred out of the department.

Graphics Unit

	<u>As of 7-31-54</u>			<u>As of 8-31-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	1	2	1	2	3	0	/1	/1
Illustrators	0	11	11	0	11	11	0	0	0
Graphic Designers	0	2	2	0	2	2	0	0	0
TOTAL	1	14	15	1	15	16	0	/1	/1

One field clerk was added to the unit during the month.

Procedures Unit

	<u>As of 7-31-54</u>			<u>As of 8-31-54</u>			<u>Net Change</u>		
	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>	<u>Ex</u>	<u>Non-Ex</u>	<u>Total</u>
Staff	1	1	2	1	1	2	0	0	0
Clerical	0	1	1	0	2	2	0	/1	/1
Operations Analysts	11	0	11	11	0	11	0	0	0
TOTAL	12	2	14	12	3	15	0	/1	/1

One general clerk returned to work from an illness leave of absence during the month.

[REDACTED]

FOR THE MANUFACTURING DEPARTMENT

An analysis of data taken during the last half of 1952 when some shapes were analyzed by two different methods pointed out that there exists essentially no correlation between the measurement methods used. This lack of correlation indicates that the basic variation of true plutonium content is negligible compared with the inherent variation of the measurement methods used to determine plutonium content. As a result of this analysis, it has been pointed out that as long as the process average is maintained at a level in the neighborhood of the average observed for 1952, then for all practical purposes all shapes produced will have a percentage plutonium content above the lower specification limit. (Letter: "Variation in Pu Content of Shapes," to D. F. Shepard.)

A meeting was held with personnel of the Analytical Control Sub-Section of the Separations Section to discuss the feasibility of reducing the number of determinations presently made on the samples submitted to the laboratories. Since the major part of such duplicate determinations reflect only the ability of the analyst to repeat a measurement and do not constitute a true independent measurement, it is felt that replacing the duplicate determination system by a single determination system with occasional independent check analyses will not endanger the control of the laboratory and definitely could lead to the establishment of more sound precision statements to be associated with the various types of analyses made by the laboratories. At the meeting, it was requested that an investigation be made to determine from a statistical standpoint the best procedures to maintain laboratory control and to minimize the variance of analyses for a fixed total cost.

At the request of the Analytical Control Sub-Section, recent nitrate shipper-receiver differences were analyzed to establish whether or not there has been any change in the situation since the analysis made on 1952 data. The results of the current analysis indicate that no significant change has taken place since 1952. There exists a random variation superimposed on long-term trends. The random component of the variation can be reasonably explained by the precisions of the measurement methods used. However, no satisfactory explanation has been found for the long-term trends.

Analysis preliminary to the reorificing of D-reactor is presently being carried out. Two sets of data were processed to yield individual tube powers and power factors, and tube plugging indices. This information will be used in establishing an optimum orifice pattern.

The Canning Unit of the Metal Preparation Section has recently become concerned with the increased number of canned assemblies rejected because the temperature of the canning bath was not within written specifications. A request was received to determine if excessive variation occurred in the calibration or reading of the thermocouples used for either the recording or the standard test units and to make any recommendations about these or any other possible sources of variation which might become apparent from the study. One set of data was analyzed but was not of sufficient detail to provide answers to the pertinent questions. It was agreed that more data, collected under more controlled circumstances, would be furnished for future analysis.

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Routine computational work for the Manufacturing Department consisted of three panellit base reports each for C-reactor, B-reactor, and D-reactor. At present, four reactors are being serviced by this type of report: the three mentioned above, and F-reactor. The procedures for processing and transmitting the data have worked out quite satisfactorily, and there are indications that the data from DR and H-reactors will be processed in similar fashion in the near future.

The study of the flow of production data in the 100 Areas is nearing completion. Flow charts are being drawn to display various flows and to point out "loose ends" that need to be "tucked in." As the 100 Area study is nearing completion, more concentration is being placed on the study of the flow of production data in the 200 West Area.

Construction of the overall Redox Model was completed by the Graphics Unit this month. Actual work accomplished during August included fabrication and assembly of the silo column connectors, vertical piping and general outside architectural details. Although the model is ready for delivery to the Separations Section the model will remain in the 700 Area until after it has been displayed at the special meetings scheduled at the end of September.

Five drawings illustrating heat losses in power furnaces were completed for Plant Engineering and have been submitted to Printing for publication.

Nine charts and schematic drawings were prepared for the Reactor Section and will be published in document HW-32088 titled "Interim Report - Evaluation of Poison Column Control - Facility."

Additional graphics services for the Manufacturing Department included hand lettering job performance merit citations; preparation of photo copy for a manual on the Purex Facility; and preparation of control charts.

For the Manufacturing Department 3 routine IBM reports and 8 non-routine jobs were completed for a total of 11 IBM service requests.

FOR THE ENGINEERING DEPARTMENT

Progress Report 1 of the Reactor Fuel Elements Operations Research Program will be issued shortly. This report deals with the statistical distribution theory underlying the slug rupture problem and the development of uniform testing procedures to be used on a plant-wide basis. Work has begun on the next phase of the over-all program, namely, a thorough statistical examination of past data in order to evaluate a number of variables on fuel element pile failures.

Experimental data pertaining to the bond strength of hot pressed slugs were analyzed for the Fuel Examination Group of the Fuel Technology Sub-Section. This experiment had been designed to determine the optimum preparation conditions based on the criterion of bond strength performance. The data indicated that the experimental error involved was so great that, if any set of optimum conditions did exist within the range of values studied, it could not be detected without refining experimental techniques to decrease the experimental error. (Secret Rough Draft: "Bond Strength Experiment," to W. E. Foust).

Analyses of a preliminary experiment to determine the important testing conditions which affect the brittleness of zirconium alloys have been established. The results of this study will make it possible to conduct a more controlled experiment to test the effects on brittleness of different metal preparatinn methods. Zirconium alloys have properties which may result in process tubes superior to those currently used. However, brittleness will first have to be reduced. A carefully controlled experiment, based on the results obtained under different testing schemes from the preliminary studies, is being designed to test the effects of different metal treatments on brittleness. An oral report was made to a member of the Product Metallurgy Group of the Applied Research Sub-Section.

A number of resonance parameter curves relating to experiments with thorium oxide, natural uranium, and J slugs had been fitted to experimental data. The least squares techniques had not been used in fitting these curves, but the resulting estimates were for the most part essentially equal to least squares estimates. The Theoretical Physics Unit of the Applied Research Sub-Section requested estimates of the variances associated with the parameters involved. These variance estimates, together with the least squares estimates of the parameters which were found as a by-product of the variance estimation, were reported orally to a member of the above group. Also, a general family of heat transfer curves involving two parameters was furnished to a member of the Theoretical Physics Unit as requested. The problem consisted in determining the successive values of one parameter such that the function attained its maximum value at six given values of the second parameter.

Procedures are presently being written for the routine processing of counter data from exponential pile experiments. In these experiments, indium or gold foils are placed in various positions in the pile, exposed for a certain period of time, and then placed in ion chambers for counting. From the observed number of counts, it is possible to infer the saturated (long-term) activity of the foil, hence the flux at a certain position in the pile. The computation will consist of converting counter readings to saturated activities and averaging these activities over a give position in the pile. On the basis of certain statistical techniques, bad measurements will be eliminated, and a new average computed. It is expected that the data processing will be carried out on the card-programmed-calculator on a daily basis.

Computational work is continuing on the problem of determining Hanford lattice parameters from exponential pile data. In its present form, the problem consists of fitting a theoretical curve to buckling data obtained for a number of cell sizes. An iteration method is being used to determine the parameters which appear nonlinearly in the theoretical expression. To date, curves have been fitted to both wet cell and dry cell data, and a curve is presently being fitted to the combined wet and dry lattice data.

Work is proceeding on the estimation of parameters, and the variances associated with these estimates, in the buckling experiment previously reported. The computational difficulties that had been encountered were overcome by fixing one of the four parameters involved and estimating the remaining parameters. This was permissible from a physical viewpoint because the value of this parameter was pretty well

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known in advance, and the main interest lay in the estimation of the remaining parameters together with precision statements about them. Future work will involve fitting similar curves through additional experimental data. This work is being done for the Exponential Physics Group of the Applied Research Sub-Section.

The initial attempt to approximate total plutonium and plutonium-240 concentrations by simple functions of flux and time of exposure was moderately successful. The expression for totalplutonium was accurate to at least one per cent, and hence acceptable for present purposes. The expression for Pu-240, however, which is a more rapidly varying function, was in error by as much as 4%. Hence, an attempt was made to isolate in each of these expressions the terms which contributed most to the actual concentration. As a result of this attempt, two new expressions, one for total plutonium concentration and one for plutonium-240 concentration, have been established. As before, each of these expressions involve nine parameters, which will be estimated by the method of least squares. Two independent determinations of these parameters will be made, using two different values of the neutron capture cross section of neptunium-239.

Work has been resumed on the numerical solution of a set of nonlinear differential equations expressing the concentration of uranium and plutonium isotopes as a function of exposure. The problem was reformulated to include an additional isotope, and new constants have been supplied. A satisfactory method of integrating these equations was devised earlier, and will be used to solve the problem in its present form.

Work is proceeding on the calculation of unsteady state slug temperatures for the Heat Transfer Group. The calculation is lengthy, involving the determination of the significant roots of a transcendental equation containing Bessel functions. The work is about two-thirds complete. In addition, calculation of temperatures in a partially insulated slug was also carried out for the Heat Transfer group. The calculation involved solving six simultaneous linear algebraic equations, which was done by standard methods.

The tabulation of first collision densities has been completed. These densities will be used in transport theory calculations for obtaining pile parameters such as blackness and thermal utilization. The tables were prepared on the card-programmed-calculator, and subjected to a rigorous differencing scheme to check their accuracy. This was necessary because these functions will be used in calculating multiple collision densities. Planning for this calculation is presently being done. Among the functions required for this calculation are the K_j functions for which a card table was prepared earlier. Since the K_j functions appear in such a manner as to make it impractical to use the card table, curves are being fitted to some 5 or 6 of the necessary functions.

A new formulation of Wilkin's integral equation has been received and is being programmed for machine solution. The solution to this equation yields the velocity distribution of neutrons in a graphite moderated reactor. Of particular interest in the present problem is the way in which various amounts of neutron absorbing materials cause the neutron velocity distribution to depart from the Maxwellian distribution. The present formulation is intended to eliminate the earlier difficulties arising from the extreme range of numbers encountered in the numerical work. In addition, a number of valuable checks have been incorporated to indicate the accuracy and suitability of the computational methods used.

Further empirical corrosion data relating to Production Test 519 have been received from the Pile Coolant Studies Group of the Pile Technology Sub-Section. These data will be analyzed in order to attempt to determine what effects temperature, power, and time have on corrosion. The computations necessary for the statistical analysis are now being performed.

A somewhat complicated exponential type function involving two parameters was fitted through experimental data at the request of the Pile Coolant Studies Group. The complications arose from the fact that one unknown parameter was expressed as one term in the denominator of a fraction after the logarithmic transformation had been made. However, since this was known to be comparatively small, this fraction could be rewritten as the sum of two fractions with the unknown in the numerator, neglecting all remaining terms which were very nearly zero. Estimates of the variances of the parameter estimates were also calculated and submitted to a member of the above group.

Analysis of corrosion data to indicate which combination of slug jacket alloy and process tube alloy would result in the least corrosive activity has been completed for the Counting & Corrosion Group of the Fuel Technology Sub-Section. The nonorthogonality of the data required the inversion of a 17 x 17 matrix in order to estimate the effects of varying water conditions on the results. (Secret Rough Draft: "Estimated Corrosive Rates of 37 Alloy-Couple Combination," to C. Groot).

After a recess of several months brought about by the development of new laboratory equipment, data is again arriving from the Engineering Department for the routine problem of finding the corrected distribution of intensity across an X-ray diffraction line. This problem arises in the study of the crystal structure of irradiated materials, and involves solving an integral equation which contains experimentally determined functions. This has been accomplished by means of numerical harmonic analysis.

Numerical work was started on a new formulation of the problem of pressure drop and water quality variation along a process tube. The new work is similar in many respects to that done earlier. In particular, it was possible to use almost all of the empirical curves derived earlier for the variation of steam properties with pressure. An additional assumption, that of critical flow, simplified the problem somewhat in that an outlet pressure could be specified, and pressures along the tube could be found by a one-step trial and error method. Parameters being varied in this problem include power level, water flow, and outlet pressure. To date, five cases have been run successfully. Five additional cases, having different convergence properties, will be run when a better iteration method is devised. The work is part of a study of minimum water requirements to prevent unstable boiling in a process tube.

An explanation of the statistical properties affecting the rate of flow of liquid in a column consisting of constrictions of random sizes within the column was reported orally to the Chemical Engineering Development Group of the Separations Technology Sub-Section.

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Data on Redox stack emissions is presently being analyzed for the Process Engineering Sub-Section of the Design Section. The data consists of millirad readings of ruthenium particles taken during the past several months at stations located at specific distances and directions within a radius of 12000 feet from the Redox stack. On June 1, the sampling area covered at a station was increased from one square meter to a circle of forty feet diameter. As a consequence, considerable work has been done to determine what effect this sampling change should have on the readings. The primary aim of the analysis is to determine the random variation of these readings, so that significant increases can be ascertained. The direction, distance, and migration effects are also being investigated.

Routine computational work for the Engineering Department consisted of JQ charge data reduction, Bluenose data reductions, and Group Nine Metal Studies calculations for April. Work is continuing on the conversion of Group Nine Metal Studies to a more comprehensive study to be known as the Power and Exposure Study. Data for the month of June has been collected under this new study and is now ready for machine processing. Frequency distributions involving this data were also run this month. The distributions were made on exposure and exposure forecast for each zone, metal lot, and pile.

Under the new classified document control system the first cycle of inventory lists was completed within the allotted 30 day period. Every holder of classified documents received a listing of his holdings which he was required to certify. In the future each holder of documents will receive an inventory listing for certification once a month.

A proper control of the offsite classified documents is contingent on the building of a coding system to convert their numbers to numbers that resemble the numbering on HAPO documents. Such a plan is now in the process of being developed. The plan calls for the coding to be done automatically by IBM equipment.

A series of visual aids were prepared for the Project Section to use in their 234-5 Project Review Meeting. Graphics was informed that the material prepared was of considerable value towards making the review highly successful. As a result, future project reviews are to be treated accordingly. Raw material has been submitted and Graphics is now preparing visual aids for the Purex Project Review to be held in October. Information is forthcoming on the 105-K Project Review to be held in the near future.

Graphics continued work in the development of detailed cut-a-way perspective drawings of Purex Equipment. Illustrations in this series completed to date are of the Concentrator - Condenser, the Pulse-Column and Pulse Generator, the Sampler and the Ventilation System. Perspective projection and line work have been completed on the Centrifuge unit and it is scheduled for completion in the near future.

Work on the 105-C Examination Facilities illustrations of equipment has been set aside for higher priority work.

Additional Graphics services for the Engineering Department included preparation of seven plates for document HW-32661 titled "Test Slugs Exposed to Steam"; preparation of drawings and charts for document HW-31929 titled "Promotion of Chemical Reaction in Gas-Graphite Systems by Gamma Radiation"; completion of illustrations for document HW-31813 titled "Review of Process Tube Distribution Measurements"; photo mounting and touch-up for document HW-31619; preparation of standard format, sample graphs and photographs for a document HW-27116 titled "Preparing Formal Reports"; and photo-mounting and touch-up for document HW-32369.

30 routine IBM reports and 28 non-routine IBM jobs were completed for the Engineering Department for a total of 58 IBM service requests.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

The average numbers of people traveling to the outer areas by bus have been computed for the Transportation Section to enable them to assign the loading locations for the different areas in the new transportation facility in such a fashion as to minimize congestion.

The first progress report on the Transportation Operations Research program containing significant recommendations is in preparation.

The Telephone Operations Research Program has been completed. The final phase of the program was conducted to determine how many leased lines the plant should rent for long-distance service to those cities for which leased lines are already provided in order to minimize the total cost of toll and leased-line usage. The findings of the study will be presented in Progress Report 3 which is being prepared.

Study of store orders issued by central stores and area stores has been completed as part of the Inventory Control Operations Research Program. From a statistical sampling and analysis of the store order issue file, the dominance of central stores was demonstrated. Even for delivery points within the barricade, central stores supplies a major share of the issues. From the same sampling, the value of the median store order was compared with the cost incurred in processing individual orders. The findings of the study and their implications will be narrated in Progress Report 3 which is forthcoming.

Consideration is presently being given to an interim manual inventory control procedure to be used while awaiting the possibility of a mechanical procedure. In order to provide an objective method for assistance in selecting the optimum purchase quantity and reorder point, a number of mathematical models have been given consideration. However, the most comprehensive models involve the solution of quite complicated simultaneous equations and were therefore rejected as being too elaborate to permit economical and practical application at this time. As a consequence, a modified approach was selected which is considered sufficiently realistic to provide a guide to appreciable improvements in inventory control, although it ignores the interaction between purchase quantity and reorder point. The method of implementing this approach for the field is now being considered, and it appears likely that nomographs can be provided to facilitate the computation of purchase quantities and reorder points.

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The IBM system developed for the distribution of safety awards was completed during August. This system covered the selection, purchase and distribution of the awards together with adequate controls. This reduced the time-lag between the award date and the distribution of awards. It also reduced the amount of clerical help necessary for processing.

For the Plant Auxiliary Operations Department 14 routine IBM machine reports and 3 non-routine jobs were completed for a total of 17 IBM service requests.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

Machine procedures are being written for the routine processing of data from the Calibration Units of the Radiological Sciences Department. This Unit is responsible for the maintenance and calibration of a large number of radiation monitoring instruments. To simplify the record keeping on these instruments, it was decided to utilize punched card methods. Data on instrument inventory, calibration, repair, and usage will be recorded to the Computing Unit, where new mark-sense cards will be prepared, and routine reports issued as data is accumulated.

The first step in the conversion of the Regional Survey data processing problem to punched-card methods has been completed. This step consisted of establishing a numerical coding system for some 1,000 locations in the Hanford area where samples are taken. These locations include the reactor areas, separation areas, 300 area, intermediate locations, perimeter locations, nearby residential locations, and remote locations. A master card file has been set up, and listings of the file made, both in numerical order and alphabetic order. These listings are presently being used in the field.

Analyses have continued on the thyroid damage and concentration of radioactive iodine in the body tissues of sheep fed different levels of I^{131} . The data have been collected by the Experimental Animal Farm Unit of the Biology Section over a four-year period.

An oral report was made to a member of the Physics Group of the Biophysics Section on the best method for obtaining a weighted average and precision statement on the weighted average when the values to be averaged are originally obtained with varying degrees of precision.

Routine computational work for the Radiological Sciences Department consisted of weather and wind studies calculations, sheep thyroid and radioanalysis calculations, and aquatic biology calculations.

The Graphics Unit entered an entirely new field this month in the development of material to be used in a television demonstration at the A.V. M. A. Convention in Seattle. The work was prepared for use by the Head of the Toxicology Unit and other leading veterinarians in their lecture on "The Role of the Veterinarian in Atomic Bomb Fall Out". Contacts were made by Graphics with experienced personnel in the field of TV presentation in order to develop the material to projection specification. Twenty-seven large 30" x 40" illustrations and tables were prepared. Strong contrasting tones and rendering techniques were used and all white backgrounds

were toned down. A light pastel shade of green was used for tone down in order to retard light reflectivity and projection glare. Evidence of the success of the presentation was received in commendations from members of the speaker's panel stating that the visual reception was excellent.

Five routine IBM reports and 2 non-routine jobs were completed for the Radiological Sciences Department for a total of 7 IBM service requests.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

The further analysis of attitude survey data pertinent to employees in the Employee and Public Relations Department has been completed. The attitudes of employees in separate personnel classes within sections were analyzed for those sections which made up the department at the time of the survey. It was possible to analyze the attitudes of personnel classes within units for the Health and Safety Section. Results based on statistical comparisons of average item and category scores obtained from the questionnaires and a summary of comments written on the blanks provided by the questionnaires comprise the report. (Letter: "Attitude Survey Results -- Employee and Public Relations Department," to C. N. Gross). This report completes a series of reports for departments and major sections requesting further analysis of the attitude survey data on their employees. For each section or department, a group formed by a breakdown according to organizational group and personnel class was analyzed separately if a minimum of five questionnaires were returned by employees in that group. The total of all groups analyzed represents ninety per cent of the plant population.

At the request of Personnel Practices, information was supplied on employee attitudes toward the Suggestion System as reflected on the 1953 attitude survey questionnaires. Tables containing average item scores on the item "The Suggestion System works well" were prepared. The first table gives these scores for each personnel class within departments and major sections. For nonexempt production and service employees, additional tables containing these scores by sub-sections or units within section (and by areas within the Reactor Section) were supplied. Statistical comparisons were performed on the scores within each of these additional tables to indicate appreciable differences in the attitudes of similar groups toward this item. A list of all written comments pertaining to the Suggestion System was also included. (Letter: "Attitudes Toward the Suggestion System," to G. D. Barr).

Assistance was given to the Suggestion System for the establishment of a follow-up procedure for active suggestions. A procedure was established using existing recordings, yet improving the method of reporting. One clerk can now prepare the monthly report in less time than previously required by two clerks.

At the request of the Personnel Policies Unit, the possibility of developing a procedure for recording and analyzing the military status of HAPO personnel was studied. The information presently available in the manpower cards (punched cards) is essentially what is needed. With minor revisions this information will satisfy the requirements.

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Graphics services for the Employee and Public Relations Department included preparation of organization charts for the new directory; making arrangements and assisting in the production of moving pictures of the Purex Model; preparation of title blocks for movie projection; posting of current data to "Salary Distribution" charts; preparation of signs for training purposes; and hand lettering PMS certificates and place cards.

For the Employee and Public Relations Department 40 routine IBM reports and 1 non-routine jobs were completed for a total of 41 IBM service requests.

FOR THE FINANCIAL DEPARTMENT

The second phase of the long range plan for improving the IBM Weekly Payroll system is currently underway. The installation date is for processing the payroll for the week ending September 12.

Included in this phase are the preparation of new IBM internal operating procedures, new control panels for the IBM equipment, and new report forms. The results expected from the new procedures are improved reports, simplified processing, and the elimination of operations through the utilization of newer equipment. The bank reconciliation procedure is also being revised for installation concurrently with the revised payroll procedure. An interim procedure was devised whereby deposit slips were to be issued to local banks for the week ending August 22. These were in lieu of the checks previously deposited.

The Exempt Payroll and Bond Purchase IBM procedure were revised to change the control from organization number to pay number. The changes also necessitated the rewiring of the IBM control panels.

A special Salary Survey report was prepared for Payroll. This report was for Exempt College Graduate Index personnel.

A request for broad sweeping changes in the Work Order distribution system was received. Work has been begun on scoping the problem with November 1, 1954 being set as the tentative date for the installation of revisions.

Work continued during August on the development of a machine system for the recording of property records for Plant Accounting. Specific problems discussed what information should be recorded about a unit of equipment, what code structure should be used for the recording, when and how should established items be converted, and when should new items be picked up on the records. In connection with these questions, tentative forms have been designed for IBM cards, reports and records.

The original water-calibration data have been received for Redox tanks H07 and E-12, and work to fit calibration curves to these data using statistical techniques has been started. There exist several questions concerning these data which will have to be answered by the people who originally recorded it before the work of fitting the curves can be concluded. A meeting of the interested parties is now being arranged.

The Purex Hot Semi-Works will start up in the near future. To convert radio assay count measurements to grams, an "F" factor vs. MWD/ton curve will be required for that operation. Since the Purex Hot Semi-Works will process material of approximately the same exposure level as that which is currently being processed through Redox, the desired curve will be obtained using empirical "F" factor data from recent Redox runs.

Graphics prepared a series of visual aids requested by representatives of Financial and Engineering on "Power Study" data. This material was developed on a rush basis for use in a group meeting of Northwest Utility officials.

For the Financial Department 532 routine IBM machine reports and 17 non-routine jobs were completed for a total of 549 service requests. In addition, 26053 paychecks and 26053 earnings statements were prepared and 25992 cancelled paychecks were reconciled.

FOR THE ATOMIC ENERGY COMMISSION

The recalculation of the entire collection of Hanford Release data has been completed. This calculation involved extensive use of the card-programmed-calculator, and was carried out on a high-priority basis. In addition, two routine reports were issued this month.

Graphics services for the Atomic Energy Commission consisted of the layout and inking of the annual budget and functional AEC organization charts; preparation of procedure flow charts; and completion of a flow chart titled "Modifications to Fixed Price Construction Contracts".

For the Atomic Energy Commission two routine reports were prepared by IBM.

SUMMARY

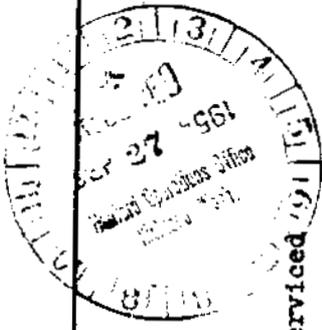
During the month of August, 60 statistical, mathematical, procedural, and graphical problems were completed, and as of August 31, a backlog of 213 problems were on hand. In addition 626 routine IBM reports and 59 non-routine IBM jobs were completed for a total of 685 IBM service requests; 26,053 paychecks, 26,053 earnings statements were prepared, and 25,992 cancelled paychecks were reconciled.

A total of 95 new forms were designed, 340 orders for forms were received of which 3 were rejected and 337 approved for a total of 1,049,725 copies.

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	Percent of Services Rendered					Operations Analysis Section
	Units					
	Mathematics	Procedures	Computing	Graphics		
Department Serviced						
Manufacturing	13	0	5	16	8	
Engineering	25	42	31	48	33	
Plant Auxiliary Operations	3	4	4	9	5	
TOTAL OPERATING DEPARTMENTS	41	46	40	73	46	
Radiological Sciences	5	0	1	3	2	
Employee & Public Relations	3	5	1	5	3	
Financial	2	20	54	0	32	
TOTAL STAFF DEPARTMENTS	10	25	56	8	37	
Administrative and General	36	29	0	12	11	
A. E. C.	13	0	4	7	6	
TOTAL	100	100	100	100	100	100



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