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MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

JULY 1953

MAY 21 1992

HANFORD
51632

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Compiled By
DEPARTMENT MANAGERS

August 20, 1953

CLASSIFICATION REVIEW FOR
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By *RH R...*
Date *5-15-73*
U.S. AEC Division of Classification

RICHLAND, WASHINGTON

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

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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

JULY 1953

GENERAL SUMMARY

Production Operations

The startup of the fourth canning line on July 6 was a major step in achieving a production level which was a record performance and was five percent over the forecast. Use of the melt plant as a production facility was discontinued on July 15.

Reactor input production for the month of July exceeded the previous record by 12 percent, while the monthly forecast was surpassed by 8.9 percent. There was one slug failure during the month. This was a regular metal, Group 8 piece, and occurred at H pile. The new Ball 3X facilities were placed in automatic operation at all reactors, and the earthquake detector installations were tied into the automatic scram circuits in the reactors during the month.

Redox production for the month established a new record and was 135 percent of forecast. Production at the TBP plant was 88 percent of forecast, and UO₃ plant production was 18 percent over forecast. Waste metal removal was completed in tanks 102-C and 105-U.

Engineering and Technology

The Radiometallurgy Building was turned over to the General Electric Company on June 29. The first work on irradiated materials has been performed and installation of equipment is in progress. Approximately 2,000 slugs were canned with Tru-line cans and well-type, Tru-line caps. Four tube charges were made in the F pile on July 17, and the remainder are scheduled to be charged during August.

Design progress on Project CA-512-R, 100-K Reactor Facilities, was advanced to 95.1% completion.

Eighteen informal radiation incidents, 6 Class I, and 4 Class II incidents, were recorded. Excessive releases of radioiodine from the Redox plant continued.

Personnel and Services

An analysis of expenditures for plant and equipment at Hanford, representing expenditures under the du Pont contract as well as those made by the General Electric Company since it assumed its responsibilities on September 1, 1946, disclosed that the Government's capital investment as of June 30, 1953, was \$736,020,000. The completion of currently planned projects, including Program X, will bring the total to an estimated \$1,066,000,000.

Major Injury No. 97, making eight for the year to date, occurred in the 100-F Area and involved a power operator who sustained a dislocated right thumb.

Employee separation rate decreased from 1.57% in June to 1.01% in July. Sickness absenteeism was 1.17% as compared with 1.51% in June while total absenteeism was 1.72% as compared with 2.23% in June.

The total number of housing applications pending is 528.

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A-1

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STAFF

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

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HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
JULY 31, 1953

	<u>EXEMPT</u>		<u>OTHERS</u>		<u>TOTAL</u>	
	<u>7-31-53</u>	<u>6-30-53</u>	<u>7-31-53</u>	<u>6-30-53</u>	<u>7-31-53</u>	<u>6-30-53</u>
<u>Engineering Department</u>						
General	17	17	82	80	99	97
Design	161	161	38	38	199	199
Project	243	236	323	311	566	547
<u>Technical Section</u>						
General	8	8	3	3	11	11
Applied Research	120	120	61	54	181	174
Separations Technology	133	110	45	24	178	134
Laboratory Engineering	1	48	-	56	1	104
Pile Technology	105	104	70	70	175	174
Fuel Technology	75	59	74	51	149	110
Advance Technology	10	9	1	1	11	10
<u>Manufacturing Department</u>						
General	16	16	7	7	23	23
Reactor	249	247	1 030	1 012	1 279	1 259
Separations	304	308	1 198	1 200	1 502	1 508
Metal Preparation	92	92	421	424	513	516
<u>Plant Auxiliary Operations Department</u>						
General	1	1	-	-	1	1
Electrical Distribution & Telephone	31	32	138	140	169	172
Transportation	44	46	465	481	509	527
Purchasing & Stores	49	48	241	240	290	288
<u>Plant Protection</u>						
Patrol & Security	61	61	462	468	523	529
Safety & Fire	43	43	111	108	154	151
Office Services	23	23	302	305	325	328
Administration Main. Service	11	11	51	50	62	61
Statistical & Computing	40	39	61	59	101	98
<u>Community Operations & Real Estate Department</u>	99	101	364	347	463	448
<u>Financial Department</u>						
General	4	4	7	8	11	12
Accounting	45	45	197	195	242	240
Payroll & Auditing	25	25	54	57	79	82
<u>Employee & Public Relations Department</u>	47	48	169	171	216	219
<u>Radiochemical Sciences Department</u>						
General	5	4	3	3	8	7
Records & Standards	26	27	137	138	163	165
Biophysics	59	60	58	58	117	118
Biology	40	42	34	36	74	78
Engineering	3	-	-	-	3	-
<u>Medical Department</u>	40	39	208	215	248	254
<u>CAF</u>	3	3	2	2	5	5
<u>Total</u>	<u>12</u>	<u>12</u>	<u>28</u>	<u>29</u>	<u>40</u>	<u>41</u>
Total	<u>2 245</u>	<u>2 249</u>	<u>6 445</u>	<u>6 441</u>	<u>8 690</u>	<u>8 690</u>

AREA PERSONNEL DISTRIBUTION
JULY 31, 1953

	100-B	100-D	100-F	100-H	101	100-X	200-E	200-W	300	700-1100-3000	
	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area And	
<u>Engineering Department</u>										<u>Plant General</u>	<u>Total</u>
Exempt	53	71	2	13	14	25	40	70	252	333	873
Other	25	37	2	45	3	16	52	27	217	273	697
Total	78	108	4	58	17	41	92	97	469	606	1 570
<u>Manufacturing Department</u>											
Exempt	85	59	43	64	-	7	7	280	90	26	661
Other	252	277	380	159	-	-	113	1 069	392	13	2 656
Total	337	336	423	223	-	7	120	1 349	483	39	3 317
<u>Plant Auxiliary Operations Department</u>											
Exempt	22	9	7	8	4	5	22	20	15	191	303
Other	60	64	106	57	11	45	91	193	112	1 092	1 831
Total	82	73	113	65	15	50	113	213	127	1 283	2 134
<u>Community Operations & Real Estate Dept.</u>											
Exempt	-	1	-	-	-	-	-	-	-	98	99
Other	-	-	-	-	-	-	-	-	-	364	364
Total	-	1	-	-	-	-	-	-	-	462	463
<u>Financial Department</u>											
Exempt	-	-	-	1	-	-	-	1	1	71	74
Other	-	-	2	1	-	-	2	1	-	252	258
Total	-	-	2	2	-	-	2	2	1	323	332
<u>Employee & Public Relations Department</u>											
Exempt	-	-	-	-	-	-	-	-	-	47	47
Other	9	5	5	4	1	-	10	3	36	96	169
Total	9	5	5	4	1	-	10	3	36	143	216
<u>Radiological Sciences Department</u>											
Exempt	1	-	42	-	-	-	2	17	58	13	133
Other	6	-	35	-	-	-	5	19	154	13	232
Total	7	-	77	-	-	-	7	36	212	26	365

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MANUFACTURING DEPARTMENT

JULY, 1953

METAL PREPARATION SECTION

The net production for the month was 215 tons which is a record performance and was five percent over the forecast. The startup of the fourth canning line on July 6 was a major step in achieving this production level. The month's production consisted of 203 tons of 8-inch material and 12 tons of 4-inch. The overall canning yield increased to 73 percent as a result of lowered rejection rates due to non-seating and poor bonding.

The melt plant operation was discontinued as a facility on July 15, 1953 with the casting of the past production billet.

Lead dip canning of all material commenced on July 27 on a production test basis.

There was one 8-inch slug autoclave failure during the month with none on 4-inch slugs.

REACTOR SECTION

The input production for the month of July exceeded the previous record by 12 percent. The monthly forecast was surpassed by 8.9 percent. The production achievement resulted from a very high overall time operated efficiency and the increased power level at H reactor. The established maximum operating level at H reactor was increased 125 MW during July (maximum level included 18 MW of "C" metal burnout) as a result of operating under the "trip before boiling" philosophy.

The P-10 input production at the DR reactor was

There was one slug failure during the month. This was a regular metal, Group 8 piece, and occurred at H pile. A total of 23.5 hours outage time was chargeable to this rupture.

The new Ball 3X facilities were placed in automatic operation at all reactors. Also, the earthquake detector installations were tied into the automatic scram circuits in the reactors during the month.

During July, nine reactor scrams occurred involving outage time of 2.9 hours. Of major interest was the scram caused by a lead disc plugging a cone screen at C reactor. The ninth scram involved the dropping of the third safety balls at D reactor, which was caused by the failure of a resistor in the "R" relay coil circuit. The outage for the recovery of the balls was 64.3 hours.

SEPARATIONS SECTION

The Redox production for the month established a new record and was 135 percent of the forecast. A new record of 158 tons of uranium was produced. A total of

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DECLASSIFIEDSEPARATIONS SECTION (Continued)

20 runs was started in the T plant and the production was 67 percent of the forecast.

The Redox plant operated at a 5.1 ton per day rate. The standard rate for the extraction batteries was 6 tons per operating day until July 24, when the rate was increased to 7 tons per day. Operating difficulties experienced included the sticking of 1A and 1S feed control valves, and foaming in D-4 condensate concentrator. Since head-end scavenging operations were not possible due to centrifuge difficulties, it was necessary to continue operating with three uranium and three plutonium cycles throughout the month. At month end the plant was shut down for extensive equipment replacement, column flushing, and miscellaneous repairs.

The TBP plant produced 212 tons of UNH which was 88 percent of forecast. The plant operated at a 6.8 ton per day rate, with an efficiency of 88 percent. Feed rates varied for both lines, from 3 to 6 tons per day, being dependent on decontamination performance and waste losses. Continued buildup of contaminated solids in the columns and vessels which necessitated frequent and extensive line flushes made sustained line rates practically impossible. Attempts to process "green" feed (minimum 2.5 years old) resulted in poor performance.

Generally, the sluicing operation operation in the various tank farms was very good over the month. One Nagle pump failed on July 13 in 106-C and one Byron-Jackson failed on July 5 in 101-T. Waste metal removal was completed in tanks 102-C and 105-U.

The UO_3 plant production was 18 percent over forecast with a record production of 388 tons. A maximum production rate of 17.5 tons of uranium was achieved for a 24-hour period. The average daily operating rate for the month was 12.2 tons.

The East Area evaporator was shut down for repairs on July 9 after completion of the re-evaporation of first cycle bottoms. The West evaporator is currently evaporating TBP waste and is obtaining a 50 percent reduction.

The 234-5 facility made the commitment.

GENERAL

A review of the Fiscal Year 1954 coal contract bids resulted in the rejection of the low bid submitted. Previous evaluation tests on this specific coal proved that accepting the bid and burning this coal would have resulted in higher cost per pound of steam produced. The cost for the year, utilizing the above coal, would be \$465,000 more than utilizing the coal offered by the second low bidder. The re-bids brought in a new low bidder offering a high quality coal. The cost per million BTU on the re-bid was 2-3/4 percent lower than the cost per million BTU on the initial bid. This year's coal contract, for the first time, will contain a rejection clause which will enable the Manufacturing Department to reject any coal which does not perform satisfactorily under our operating conditions.

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GENERAL (Continued)

Personnel

Total on roll July 1, 1953	3307
Accessions	39*
Separations	28*
Total on roll July 31, 1953	3318

*Does not include intra-department transfers.

John A. Gross

for C. N. GROSS, MANAGER

MANUFACTURING DEPARTMENT

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MANUFACTURING DEPARTMENTPATENT REPORT SUMMARY
FOR
MONTH OF JULY, 1953

Richland, Washington
August 11, 1953

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

INVENTOR

NONE

TITLE

C. N. Gross

for C. N. GROSS, MANAGER

MANUFACTURING DEPARTMENT

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Section 9 verified by SF Accountability Section

V. D. Donike

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

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HW-28906

Richland, Washington
August 11, 1953

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
JULY 1953

I. RESPONSIBILITY

Responsibilities of the Metal Preparation Section remained unchanged.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	<u>July</u>	<u>June</u>	<u>Year To Date</u>
Acceptable Pieces Canned (4")(Tons) Gross	14	37	155
Acceptable Pieces Canned (4")(Tons) Net	12	37	150
Canning Yield (4")(%)	69.8	67.6	64.5
Acceptable Pieces Canned (8")(Tons) Gross	205	124	1039
Acceptable Pieces Canned (8")(Tons) Net	203	122	1027
Canning Yield (8")(%)	74.6	69.2	70.7
Total Acceptable Pieces Canned (Tons)Gross	219	161	1194
Total Acceptable Pieces Canned (Tons)Net	215	159	1177
Acceptable Pieces Canned (4" and 8") (% of forecast)	105	98	103
Autoclave Frequency (4")(No./M)	.00	.00	.02
Autoclave Frequency (8")(No./M)	.02	.00	.02

1. Statistics (Continued)

	<u>July</u>	<u>June</u>	<u>Year To Date</u>
Briquettes Produced (Tons)	0	1	85
Chip Recovery Yield (%)	0	19.4	84.8
Billets Produced (Tons)	12	32	299
Melt Plant Billet Yield (%)	86.6	87.4	85.9
Melt Plant Solid Yield (%)	96.6	97.3	95.9
Oxide Burned (Weight out tons)	5	3	36
Poison Canned (Number Pieces)	0	0	4450
Chemical 68-56 Canned (Number Pieces)	0	0	0
Chemical 10-66 Canned (Number Pieces)	264	0	1713
"J" Slugs Canned (Number Pieces)	16	3441	12120
"N" Slugs Canned (Number Pieces)	2628	4760	16636
Special Requests (Man Hours)	1457	1233	10531
305 Routine Tests (Man Hours)	159	92	948
305 Special Tests (Man Hours)	736	1458	7655
Average Steam Generated (M lbs/hr)	16.4	16.8	
Maximum Steam Generated (M lbs/hr)	52.0	43.0	
Total Steam Generated (M lbs)	12200	12300	
Coal Consumed (Tons)	824	867	
Sanitary Water from 3000 Area (million gals.)	46.6	38.7	
Total Water Average Rate (gpm)	1044	896	
Chlorine Residual	.32	.42	

2. Activities

The net production of acceptable slugs was 215 tons (a new high) of which 94% were eight-inch. The combined canning yield increased 5%, resulting primarily from reductions in non-seating and braze width rejects for eight-inch pieces and reductions in non-seating, AlSi and poor bond rejects for four-inch pieces. .

A fourth canning line was started on July 6, 1953.

One eight-inch autoclave failure during the month was believed to have been caused by a defective can.

The melt plant operation was discontinued on July 15, 1953. The remainder of the month was devoted to cleaning up the melt plant in preparation for transfer to the Engineering Department.

Work was started during the month to prepare used bronze crucibles and melt plant insulation for shipment off-site for uranium recovery.

Acceptance testing of a shipment of caps by statistical sampling methods was initiated this month. The use of such a sampling plan permits a quicker evaluation of the condition of the shipment and permits suffi-

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2. Activities (Continued)

cient time for corrective action to be taken if necessary, before the material is scheduled for production use.

During the month a noticeable increase in corrosion during autoclave testing was noted. The nature of the corrosion pits was similar to those experienced approximately a year ago when mercury was suspected as the cause. Careful examination of the entire canning and autoclave areas failed to reveal detectable presence of mercury. After exhaustive investigation it was felt that the major cause of this difficulty may have been due to insufficient cleaning of autoclave baskets and liners prior to loading and testing.

It has been previously reported that addition of small amounts of aluminum to the tin bath had reduced the incidence of poor bond rejects by 50%. Continued investigation indicates that over longer periods this improvement is not apparent. Laboratory analyses are being made to determine if this practice is profitable from the standpoint of effecting continuous tin recovery.

3. Special Operations

A total of 2628 lithium-aluminum alloy target slugs were canned with an over-all yield of 80%. Target slug fabrication is approximately 95% complete and it is anticipated that this program will be completed in August.

There remains to be canned in August, 642 enriched uranium-aluminum alloy fuel slugs which have been reduced in diameter by sizing. These will be used as replacements for pile failures and will complete the P-10 program.

Lead dip canning of eight-inch beta heat treated uranium slugs under provisions of PT-313-105-25M was started on July 27. There are approximately 190 tons of material available for this test and it is scheduled for completion in August.

4. Schedule Variance

Acceptable slug production exceeded forecast by 5% as a result of improved canning yields and the production of a higher percentage of eight-inch slugs than was planned.

B. Equipment Experience

1. Operating Continuity

Lost production time increased about 2% over the previous month, mainly due to eleven furnace failures.

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B. Equipment Experience (Continued)**2. Inspections, Maintenance and Replacements**

Boilers number 2 and 4 were inspected by a Traveler's Insurance Company inspector and found in good condition. The twenty autoclaves in building 314 were also inspected and found to be in good condition.

C. Improvement Experience**1. Production Tests**

PT-313-105-10M - "Fabrication and Irradiation of Triple Dip Slugs Canned in an AlSi Bath with Impurity Levels Above Normal" (HW-26860). Tests on this material were completed by the Engineering Department during the month. Of approximately 3900 slugs canned with a canning yield of 74%, about 3000 were shipped to Reactor. Except for a somewhat high frost test rejection rate, canning performance of this material was normal.

PT-313-105-16M - "Evaluation of Diversey 514 as an Etchant in the Aluminum Component Cleaning Process" (HW-27550). Process specifications have been revised to allow use of Diversey 514 and it will be used as etchant when the present supply of phosphoric acid is exhausted.

PT-313-105-19M - "Irradiation of Triple Dip Canned Slugs from Rods Rolled at Fernald" (HW-26851). Canning under this production test was temporarily discontinued during the month. About 225,000 slugs have been canned to date with normal canning yields. About 120,000 pieces have been shipped to Reactor for pile loading.

PT-313-105-24M - "Pile Evaluation of Tru-Line Cans and Caps" (HW-28040). About 2000 slugs were fabricated under this test during the month with a yield of about 73%. Difficulty was experienced due to lack of special canning tools for this operation. As facing is required before and after welding, production delays were experienced. Testing was also impaired as these slugs do not fit existing frost test trays or autoclave baskets.

PT-313-105-25M - "Lead Dip Canning and Irradiation of Uranium Slugs Machined from Salt Bath Heat Treated Fernald Rolled Rods" (HW-28149). Early in the month it was found necessary to make several revisions to the ultrasonic transformation testing equipment. Canning under this test started on July 27, 1953. An excessive number of braze line rejects were detected in the form of small voids or gas bubbles. Based on evaluation by the Engineering Department, braze inspection standards were revised to accept such pieces as this appears to be peculiar to the lead dip canning process. Frost test rejects on this material are running about 12% as compared to approximately 2% on triple dip canned material. Overall canning yield to date is approximately 73%.

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C. Improvement Experience (Continued)

2. Process Tests and Revisions

MMP-313-2 - "Cap Boss and Facing Index" (HW-27844).

Approximately 1200 pieces were canned under this test during the month. Production rates were comparable to normal processing. Weld bead width and penetration were good in all cases.

MMP-313-3 - "Slug Recovery by the Use of 50% Caustic" (HW-28818).

Satisfactory cleaning of rejected slugs was obtained by the use of a 15% caustic and 13% sodium nitrate solution for dissolution of the aluminum jacket and immersion in a 50% caustic solution for removal of the bonding layer. This method has the advantages of increasing equipment capacity by requiring a shorter time cycle; apparently reduces uranium dissolution, reduces the danger inherent in hydro-fluoric acid treatment, and should be more economical. The process will be tried during the next month on a production basis.

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 no inventions or discoveries were made during the period covered by this report.

D. Events Influencing Costs

1. Labor Variance

Yield improvement of finished slugs is expected to decrease direct labor costs slightly.

2. Material Variance

The cost of process materials decreased significantly in July. This variance is primarily attributed to yield improvement and the abnormal cost in June resulting from excessing of 30,000 Scoville cans which were not suitable for process use. In addition protective clothing and other miscellaneous supplies previously carried as a part of the process materials account were transferred to other I.M.E. and applied material accounts.

3. Other

Lower equipment maintenance requirements reduced other costs slightly over the June figure. Delayed billing for furnace parts increased applied material costs considerably over the actual July expense.

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DECLASSIFIED**E. Plant Development and Expansion****1. Project Status**

Project CA-514 - "Expansion of 300 Area Production Facilities". The total authorized funds (\$600,000) for AE and AEM functions to be performed by the General Electric Company remained unchanged during this period.

Although scoping of the 313 production facilities was previously reported as complete, a realistic forecast of slug requirements for the Reactor Section has indicated the nominal production capacity should be increased approximately 76.5%. The equipment list has been revised accordingly and Project Engineering is preparing a revised estimate. Detailed design of 313 process facilities is approximately 49% complete, and construction 15% complete. The contractor is proceeding with excavations for building footings and foundations. The concrete retaining wall around the unloading dock has been poured and the new railroad spur is being installed.

Construction of the new operations change house is approximately 72% complete. The building frame and roof are complete and work is proceeding on interior construction and finishing.

Since the Technical Section will vacate all space now occupied in the 3706 building upon completion of the Works Laboratory, it is planned to renovate this building rather than construct a new administration building. Preliminary space layouts and estimates are being prepared by Project Engineering.

The scoping of all other non-process facilities is complete and detailed design approximately 30% complete. Design is essentially complete on the 3701-L gate house addition, parking lot expansion and the roads and walkways from the gate house to the 303 Area.

2. Plant Engineering

Based on economic studies the wood container being used by Fernald to ship bare slugs to Hanford appears to be the most desirable for handling and storage purposes. Plans and arrangements have been completed to test the feasibility of mechanically feeding the slugs from the wooden containers into the baskets at slug pickle station.

Tests to determine the practicability of pumping molten metal instead of using ladles in the canning operation were concluded. Since the results indicated that the pumping is feasible, less hazardous and more economical, recommendations have been made to purchase the required pumping equipment.

A reduction in the consumption of methanol for can and cap drying is expected through the addition of a tank ahead of the present process tank.

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2. Plant Engineering (Continued)

This will permit the use of expended methanol as a preliminary rinse, thereby reducing the rate of water carry-over into the second tank and extend the usage of the solution. An annual savings of about \$7,500 is expected from applying this procedure at present production rates.

A model of the clamping type basket for the pneumatic canning jacks has been undergoing test on a canning line during the month. Through the use of this basket the can-sleeve assemblies are released only during the load and unload periods of the assembly cycle, thus insuring a minimum variance in the preheat and submerge phases of the process cycle.

Two proposals for a machine to stamp, face and form the cap on canned slugs have been prepared for consideration in the expansion program.

F. Significant Reports Issued1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-28561	Monthly Report, Process Sub-Section, Metal Preparation Section, June, 1953	E.W. O'Rourke	7-1-53
HW-28599	Metal Preparation Section Evaluation of Fernald Material	S.M. Gill	7-3-53

2. Non-Routine

HW-28637	Cracking of Welds in Aluminum and its Alloys	L.T. Hagie	7-7-53
HW-28645	Permanent Uranium Content Factor for Tin Dross	T.G. Lambert	7-7-53
HW-28670	Interim Report Number 4 on P-10 Slug Production, July 1, 1953	H.G. Henry	7-1-53
HW-28776	Trip Report-Review of Quality Control at Alcoa Research Laboratory, Seventh Annual Quality Control Convention, and Savannah River Project	L.T. Hagie	7-20-53
HW-28782	Results of Process Test MP-313-2 - Boss Depth as Index for Facing Operation	T.G. Lambert	7-21-53
HW-28810	General Analytical Control Program I Analytical Results	W.G. Hudson	7-24-53

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DECLASSIFIED2. Non-Routine (Continued)

HW-28811	Trip Report, July 5 to 9, 1953 Manufacturing Department Discussion with National Lead Company of Ohio, Feed Materials Production Center, Fernald, Ohio	S.M. Gill	7-24-53
HW-28818	Process Test MMP-313-3 Slug Recovery by the Use of 50% Caustic	D.S. Dixon	7-24-53
HW-28819	Interim Report on Canning AlSi Cooling Curves, Thermal Analysis and Effects of Tin Content.	D.S. Dixon	7-24-53
HW-28664	Project CA-514 - Change in Scope. In- corporation of Radiographic Weld End Examination	J.W. Nageley	7-28-53
HW-28835	Project CA-514 - Process Equipment Requirements.	J.W. Nageley	7-28-53
HW-28763	Tentative Production Schedules, 300 Area "X" Program, Revision I	J.W. Nageley	7-20-53

III. PERSONNELA. Organization

No change.

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	4	4	0
Operations	208	207	- 1
Power & Maintenance	252	250	- 2
Process	29	29	0
Plant Engineering	21	20	- 1
Radiation Monitoring	<u>3</u>	<u>3</u>	<u>0</u>
Section Total	517	513	- 4

C. Safety Experience

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

A small zirconium fire occurred in a lathe chip pan in the 3717 shop with no damage resulting.

D. Radiation Experience

The badge film of an operator assigned to slug pickle operation indicated an exposure of 320 mrep for a one week period. He wore his personnel meters in an unapproved manner and the film badge hung between the slugs causing an artificially high film result. The operators have been re-instructed in proper wearing of personnel meters and the installation of transformation testing equipment at this work location has decreased the potential for exposure.

A six hour training course for exempt personnel on "Principles and Methods of Radiological Protection", was started during the month. Each of the four lectures will be given four times in order to cover the majority of supervision in the Metal Preparation Section. The course will take four months to complete.

Two dogs reported to be swimming in the waste ponds were pursued by Security Patrol and captured in North Richland. Survey of the dogs and patrolmen failed to detect evidence of contamination.

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

S. M. Gill visited the National Lead Company of Ohio to discuss slug manufacturing problems.

2. Information Meetings

The subject of indirect costs accrued by servicing organizations was discussed with exempt and non-exempt employees of the Power & Maintenance Sub-Section on July 7 and 9, 1953.

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WITH DELETIONS**

Richland, Washington
August 11, 1953

MANUFACTURING DEPARTMENT
REACTOR SECTION
JULY, 1953

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

July was the highest production month on record for the Reactor Section and resulted in exceeding the Diamond Jubilee production goal. Input production for plutonium exceeded the previous record, established in May, 1953, by 12.0 percent, forecast by 8.9 percent and June production by 14.1 percent.

This production achievement resulted primarily from higher time operated efficiency, 91.7 percent in July compared to 83.8 percent in June, and increased power levels during operation. Reactor output production was 101.0 percent of forecast

The established maximum operating level of H Reactor was increased 125 MW during July (maximum level includes 18 MW of "C" metal burnout) primarily as a result of operation with maximum pannellit protection.

There was one slug failure (4-inch, Group 8) during the month, at H Reactor. Also, one process tube at B Reactor failed at the rear van stone flange. Investigation of another water leak at B Reactor revealed an improperly installed nozzle. Outage time due to the slug rupture and water leaks was 23.5 and 56.5 hours, respectively.

DECLASSIFIED**A. Operating Experience (Continued)**

During the month, the new Ball 3X facilities were placed on automatic operation at all reactors. Subsequently, D Reactor was shut down when the balls dropped into the VSR channels, apparently due to failure of a resistor in the Ball 3X electrical circuit (see Activities, below).

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

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 (%)	91.8	99.9	82.4	91.3	90.1	94.8	91.7
Reactor Outage Time (Hrs.)							
Plutonium Production	60.8	0.9	98.9	54.1	70.9	38.7	324.3
Special Irradiations and Tests	-	-	32.0	11.0	3.0	-	46.0
Total	60.8	0.9	130.9	65.1	73.9	38.7	370.3
Reactor Unscheduled							
Outage Time (Hrs.)	60.8	0.9	64.9	0.6	-	38.7	165.9
Metal Discharged (Tons)	13.8	-	28.6	17.5	27.2	31.8	119
Water Quality (ppm Iron)							
Raw Water - Average	0.12	0.11	0.10	0.14	0.09	0.12	-
Raw Water - Maximum	0.17	0.14	0.14	0.20	0.14	0.18	-
Process Water - Average	0.019	0.008	0.007	0.006	0.007	0.011	-
Process Water - Maximum	0.032	0.018	0.014	0.014	0.014	0.023	-
Water Pumped (MM gals)							
Bldg. 190 to reactor	1636	3320	1912	1832	1637	2223	12560
Bldg. 182 to 200 Areas	32	-	375	-	-	-	407
Bldg. 181	5716		4868		1971	2583	15138
Steam Generated (MM lbs.)	133		212		118	109	572
Coal Consumed (Tons)	8184		14101		7687	7135	37107

2. Activities

The Ball 3X facilities were placed on automatic operation at all reactors during July. The only outage attributable to this action was at D Reactor on July 18 when the 3X balls, vertical rods and horizontal rods scrambled. A thorough investigation revealed the probable cause to be failure of a resistor in the "R" relay coil circuit. To prevent future difficulties from this cause, a heavy duty industrial type relay was installed in place of the existing relays at B, D, DR and F Reactors. Corrective action will be taken at H Reactor at an early date, either through replacing this relay or completion of electrical circuit modifications which eliminate the relay. This particular relay is not a part of C Reactor system.

DECLASSIFIED**2. Activities (Continued)**

A 64.3 hours outage was required for ball recovery in connection with the above incident. Inspection of two VSR channels revealed no apparent damage to the graphite as a result of the simultaneous dropping of both rods and balls. Operational data subsequent to the outage has indicated a 35 to 65 inhour reactivity loss in the top far quadrant of the reactor. This may possibly be due to residual balls but will require further investigation before this fact is definitely established.

The earthquake detector installations have been placed in the automatic scram circuits at all reactors. This action was taken at B Reactor late in June and at the other reactors early in July.

The facilities for charge-discharge of poison columns during operation (PT-105-4-MR) were placed in operation at B Reactor. During the month, the equipment was successfully used on two poison startups and in making several other flattening adjustments. This resulted in an estimated production gain of 350 MWD during the month, which is equivalent to approximately one-third of the cost of the installation.

A scheduled outage at F Reactor, begun on July 16, was extended approximately 35 hours when the charge in tube 3282-F was found to be stuck. Forces up to 14,000 lbs. were required for removal of the charge. Attempts to remove the tube were unsuccessful and it was set up as an air tube.

The contract for supplying coal to HAP0 expired June 30, 1953, resulting in discontinuance of coal receipts pending contract re-negotiation. At the end of July, the 100 Areas coal stack represented approximately five months supply. Shipments are expected to be resumed around the middle of August.

The use of activated silica in the alum water treatment process was discontinued at C Water Plant on July 8 and the D and DR Water Plants on July 16 as a result of improved raw water quality. Similar action was not taken at F Water Plant, the only other plant using activated silica, because of experimental work which is in progress.

Irradiation of P-10 material at DR Reactor continued during the month. One additional P-10 tube was charged bringing the total number of tubes to the scheduled 1076. To compensate for reactivity losses which have occurred in connection with this program, 17 dummy columns were charged with regular uranium and four with "J" slugs (uranium 235 - aluminum alloy slugs used in the regular P-10 loading). These 21 tubes plus two previously charged uranium columns were placed on trip-before-boiling limits to preclude production losses which would have resulted from high outlet water temperatures.

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

DECLASSIFIED2. Activities (Continued)

	<u>Tubes Charged</u>	<u>Tubes Discharged</u>	<u>Casks Shipped</u>
Chemical 10-66	6	2	0
Chemical 72-60	0	4	0
RALA	0	0	0
Production Tests	<u>10</u>	<u>25</u>	<u>11</u>
Total	16	31	11

B. Equipment Experience

During July, nine reactor scrams occurred. Eight of these were panellit scrams, one of which was caused from cone screen plugging with a lead disc. This represents considerable improvement over the past several month's experience with panellit scrams. The other was the Ball 3X scram at D Reactor, reported above under "Activities". Total outage time due to the panellit scrams was 2.9 hours.

No. 2 horizontal rod at B Reactor, previously reported out of service for repair of a leaking thimble, was returned to service following thimble replacement.

Investigation of the Building 105-D effluent line leak reported last month revealed that the 60-inch concrete effluent line had cracked and settled at the point where the line enters the cushion chamber wall. The six-inch tile line carrying horizontal rod water was also found to be leaking approximately four feet from the wall. The cracked effluent line was repaired with a packed compression joint and the rod water line is to be replaced during a subsequent outage.

An exterior inspection of the six original Building 184 chimneys in 100-B, D and F Areas has been completed by representatives of Custodis Construction Company. Although their final report has not been received, the necessity of minor repairs has been indicated. These repairs have been initiated in 100-D Area and will be continued within the limit of currently available funds.

Vibration of Building 190-C basement piping has been experienced since startup of these facilities in November, 1952. This vibration has resulted recently in an appreciable amount of maintenance being required to repair such items as pipe nipples, pipe hangers, valve wheels and supporting brackets which apparently are failing due to metal fatigue. On July 8, the cooling water supply line serving Nos. 8 and 9 process pump units failed making it necessary to meet the water demand with eight units instead of the normal nine for a two-hour period while emergency repairs were made. Current work by Minor Construction forces is expected to correct this vibration problem.

A representative of Travelers' Insurance Company inspected one boiler in each 100 Area Power House and completed inspection of the remaining 100 Area power building pressure vessels.

C. Improvement Experience

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

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C. Improvement Experience (Continued)

- PT-105-4-MR (Evaluation of Poison Column Control Facility)
See item above under "Operating Experience".
- PT-105-513-E (100 Areas Process Water Quality Evaluation Tests)
A normal seasonal improvement in river water quality occurred during July which permitted discontinuing the use of activated silica in the alum water treatment process. However, silica is still in use at the F Water Plant for experimental reasons.
- PT-105-531-A (Enrichment at H Pile)
This test continued satisfactorily during the month.
- PT-105-533-A (Local Controlled Increase in C Pile Tube Powers)
Currently, the tube power limit is 600 kw per tube except in the "bumper zone" of approximately 180 tubes where the limit is 700 kw per tube. It is expected that experimental data will permit increasing these limits within the next month or so.
- PT-105-534-A (D Pile Operation with Maximum Panellit Monitor Protection)
PT-MR-105-12 (Operation of H Reactor with Maximum Protection from Panellit System)
Operation of D and H Reactors continued very satisfactorily under these tests. An increase in the established maximum operating level at H Reactor of 125 MW was achieved during July.
- PT-MR-105-7 (The Effect of the Iron Content of Process Water Produced by the Ferric Sulfate Process on Over-all Economics of Pile Operation at 100-H Area)
Direct correlation between the iron content of process water and film formation in the process tubes continued to be obtained. However, at higher power levels it has not been possible to control the rate of film formation within acceptable limits without frequent full power purging.
- PT-MR-105-10 (Filter Capacity Test - 100-B Area)
An average filter flow rate of 5,300 gpm per unit was maintained from July 22 to month end at B Water Plant under this test. This represents a new record rate.
- PT-MR-105-14 (Unit Cost Reduction by the Use of Supplemental Orifices)
Twenty-four tubes are operating satisfactorily at month end with secondary orifices installed which permit alteration of process tube water flow without panellit gauge changes.

A new manual, "Process Standards - Reactor" - HW-28522, was issued in skeleton form. When complete, this manual will replace "Reactor Section Operating

C. Improvement Experience (Continued)

Standards" - HW-17565. However, it currently contains only those additional standards not covered in document HW-17565 which were necessary to conform with the recently approved Engineering Department Process Specifications. A list of these new limits is contained in document HW-28921.

There were no inventions or discoveries reported by Reactor Section personnel during July.

D. Events Influencing Costs

A change in the method of liquidating HAPO railroad costs resulted in reducing coal movement charges from \$0.70 per ton to \$0.45 per ton effective July 1. This will decrease Reactor Section coal costs approximately \$9,000 per month based on current consumption.

The Reactor Section force increased 21 employees during July. The majority of these new employees are required in connection with performance of unusual maintenance work.

The increase in reactor production during July and a decrease in unusual maintenance charges is expected to reduce the Reactor Section irradiation unit cost by approximately 12 percent compared with June. This is expected to be a new unit cost record.

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 E. P. Lee, dated July 20, 1953.

CA-431 (100-C Plant)

Installation of the automatic back wash system at Building 183-C was completed and the facilities were placed in operation. Minor Construction forces also began work on several construction items at Building 105-C.

CG-438

(Ball 3X Facilities for B, D, F, DR and H Piles)

The operation of these facilities is reported above under "Operating Experience". Revised drawings for modification of the Ball 3X electrical circuits, have been issued to the field and plans are being made to alter the circuitry as permitted by reactor outages. Major modifications to be made are alteration of the low water pressure circuit to provide two completely independent systems and installation of heavy duty hopper door solenoid coils.

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1. Project Status (Continued)

- CA-512 (100-K Facilities)
Reactor design is approximately 92 percent complete and Water Plant design 74 percent. Over-all project construction is estimated at 20 percent at KW Reactor, erection of structural steel supports for the building superstructure and installation of Transite walls is in progress. The process block remains at the -2-1/2 foot level. At KE Reactor, major building shielding walls have been poured to the 52 foot level.
- CG-495 (Outlet Tube Temperature Monitor Thermocouple Replacement - 100-B, D, F and DR Areas)
CG-536 (Painting High Tanks - 105-B, D and F)
These projects were completed during July.
- RDS-D-10 (Reactor and Water Plant Design Development)
RDS-D-11 The documents HW-28493 and HW-28494 defining the FY 1954 programs for these studies were reviewed. Working arrangements between the Plant Engineering and Process Sub-Sections are being developed.

2. Plant Engineering

A number of engineering and development studies were active in the Reactor Section during July. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in documents HW-28902 and HW-28921. Several items of interest are reported below.

Work on the study of boiler performance in the 100 Areas was directed toward preparation of a report covering the study to date.

A noise level survey at 100-Area power facilities was initiated.

Data are being accumulated to determine the reactor production losses which are currently caused by process tube cone screen plugging. The feasibility of using larger mesh cone screens is also being studied.

Initial investigation of a method to reduce startup reactivity transients by temporary helium addition to the reactor atmosphere has been completed and a production test is being prepared.

F. Significant Reports1. Routine

Monthly operating reports issued for June were:

HW-28576-A

Reactor Section

EP Lee

7-10-53

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1. Routine (Continued)

HW-28607	Operations Sub-Section	JH Warren	7-3-53
HW-28593	Process Sub-Section	RO Mehann	7-1-53
HW-28571	Plant Engineering Sub-Section	FAR Stainken	7-1-53
HW-28600	Radiation Monitoring Sub-Section	PC Jerman	7-2-53
--	Maintenance Sub-Section	EE Weyerts	7-3-53
--	Power Sub-Section	JC McLaughlin	7-2-53

Other routine reports issued during July were:

HW-28589	"Production Summary - June, 1953"	ET O'Sullivan	7-7-53
HW-28808	"Monthly Progress Report - Projects CA-431 and CA-512, July, 1953"	HT Wells	7-23-53
--	"Reactor Section Process and Cost Improvement Report, Apr. to June, 1953"	EP Lee	7-3-53
HW-28601	"Reactor Section Radiation Mon- itoring Technical Report for June, 1953"	PC Jerman	7-2-53

2. Non-Routine

HW-28522	"Process Standards - Reactor - Manu- facturing Department"	RO Mehann	July, 1953
HW-28709	"The Feasibility of a Crash Dis- charge of the Hanford Reactors Following a Disaster at Grand Coulee Dam"	FAR Stainken	7-14-53
HW-28510	"Final Report MR-105-6, Reactor Slug and Process Tube Examination"	KW Hess	7-3-53
HW-28784	"Process Test MR-105-15, Produc- tion Increases by the Use of Venturi Orifices"	JE Robb	7-28-53
HW-28846	"Prevention of Inlet Van Stone Flange Corrosion, DR & H Reactors"	RO Mehann	7-27-53
HW-28764	"Alum-Activated Silica Facilities"	RO Mehann	7-20-53
--	"Electrical Power Cost at HAPO"	RD Crosier	7-14-53
--	"Modification to 105-D Power Level Calculator"	RS Hammond	7-7-53
--	"Comparison Test: Throttling Action of Hoke Dual Valve Assembly and Pro- totype Toggle Valve for CA-512-R" (These valves are under consideration for 100-K Area reactor panellits)	TM Clement	7-1-53
--	"Performance Test for Second Prototype Panellit Gauges for CA-512-R"	TM Clement	7-31-53

III. PERSONNELA. Organization

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

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	<u>Beginning of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	3	3	0
Operations	266	268	2
Maintenance	446	462	16
Plant Engineering	26	27	1
Power	417	419	2
Process	39	39	0
Radiation Monitoring	61	61	0
Total	1258	1279	21

Changes during July consisted of 3 terminations, 5 new hires, 2 deactivations, 2 reactivations, 4 transfers out, and 23 transfers into the Section. The relatively large increase in the Maintenance Sub-Section force was primarily due to procurement of Mechanical Unit personnel to perform unusual maintenance work.

C. Safety Experience

A major injury and a sub-major injury occurred in the Section during July. The major injury, No. 97, occurred at Building 183-F on July 4 when a Power operator dislocated his thumb while moving a conveyor cover and was hospitalized for corrective action. The sub-major injury, No. 240, occurred at Building 189-D on July 14 when a mechanic fractured his toe while moving a pump.

One near-serious accident, No. 53-16, was investigated during the month. This incident resulted from failure of a turbine governor shaft at Building 105-DR which broke and caused governor parts to be hurled around the fan room.

D. Radiation Experience

There were two Class I and one Class II Radiation Incidents during July. The Class II incident, No. 19, involved overexposure of an Operations employee when irradiated dummies were handled without proper monitoring in the discharge area at H Reactor.

The Class I incidents, Nos. 75 and 76, occurred at Building 108-B and F Reactor, respectively. No. 75 involved a Reactor Section Mechanical Unit employee who punctured his left hand while performing work on P-10 extraction equipment. Urinalysis indicated a deposition of 3.6 millicuries of tritium oxide in his body. Further study of permissible limits may result in this incident being reclassified. No. 76 involved exposure of approximately 150 mrep to two Operations employees on the F Reactor wash

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D. Radiation Experience (Continued)

pad while sorting dummies with a radiation detection instrument which was not functioning properly. Investigations of the above three incidents are contained in documents HW-28876, HW-28839 and HW-28936, respective to the order discussed.

The activity of effluent water discharged into the Columbia River exceeded the normal daily limit of 360 mrep in only three instances during July. These were at DR Reactor. The maximum 24-hour dose was 370 mrep.

E. Personnel Activities

At month end, 24 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 18 of these are on assignment under the rotational training program.

Employee communication continued to receive special emphasis during the month. Eight major meetings were attended by groups of up to 50 employees. Five of these were a continuation of the previously reported series of meetings for Section non-exempt personnel in which the expansion program and production activities were discussed; two were Process Sub-Section sponsored exempt employee meetings on the subjects "Work of the Technical Section Mechanical Development Group" and "Separations Section Processes," and one was a Plant Engineering Sub-Section sponsored meeting for exempt employees on the subject "Contracts and Sub-Contracts".

Several other informational type programs or meetings were held for more specific groups during the month. All Section secretarial employees participated in the HAPO training program currently being presented by the Training and Development group of the Employee Relations Section. Also, electricians and operating personnel are receiving instructions on such subjects as 100-C Area equipment and the Ball 3X System.

Fourteen KAPL operator trainees and two Navy medical corpsmen began training assignments of four to eight weeks in the Operations and Radiation Monitoring Sub-Sections, respectively. These employees are preparing for assignments in connection with the SIR Project.

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Richland, Washington
August 11, 1953

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
JULY, 1953

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	<u>July</u>		<u>June</u>	
	<u>Normal</u>	<u>Acid Wash</u>	<u>Normal</u>	<u>Acid Wash</u>
Charges started in Canyon Bldgs.	20	1	38	0
Charges completed in Conc. Bldgs.	20	0	40	0
Special charges - Conc. Bldgs.		40		24
Charges completed-Isolation Bldg.	263	0	162	0
Average Waste Losses, %		2.3		2.2
Special charges-Isolation Bldg.		41		73
Material balance, %		99.8		99.7
Yield through Process, %		97.6		97.5
Average cooling time (days)		53		65
Minimum cooling time (days)		45		55

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SECURITY INFORMATION

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Separations Section

b. Redox Operations

	<u>July</u>	<u>June</u>
Equivalent charges started	205.2	148
Charges completed	221.1	136.4
Tons Uranium delivered to storage	157.6	102.9
Average Production Rate per operating day, Tons	6.0	5.1
Average Daily Operating Rate for the month, Tons	5.1	3.4
Average yield, %		
Uranium	97.7	98.8
Plutonium	99.0	100.7
Total Waste Loss, %		
Uranium	1.23	0.98
Plutonium	1.26	1.05
Average cooling time, days	73	80
Minimum cooling time, days	69	73
Percent down time	16	33

c. 234-5 Operations

	<u>July</u>	<u>June</u>
Batches completed through Task II	239	324
Runs completed through Task III	220	169
Reduction yield, RM	95.5	95.4
Waste Disposal, units	5.7	2.8

d. UO₃ Operations

	<u>July</u>	<u>June</u>	<u>To Date</u>
Uranium drummed, Tons	388	323	3013
Uranium shipped, Tons	395	331	2978
Average cooling time, days (Redox)	80	92	
Minimum cooling time, days (Redox)	76	81	
Waste Loss, %	0.06	1.19	

e. TBP Operations

	<u>July</u>	<u>June</u>	<u>To Date</u>
Tons received from Metal Removal	223	277	1670
Tons shipped to UO ₃ Plant	212	255	1582
Average Production Rate per operating day, Tons	7.67	10.1	
Average Daily Operating Rate for the month, Tons	6.83	8.51	
Average yield, %	94.73	93.77	

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Separations Section

HW-28906

e. TBP Operations (Continued)

	<u>July</u>	<u>June</u>
Total Waste Loss, %	4.43	4.36
Ratio Waste Volume returned to Volume removed	1.22	1.07
Percent Down Time	11	7.8

f. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped, gpm	1 569	7 594
Filtered water pumped, gpm	460	1 147
Steam generated, lbs/hr	22 153	150 205
Maximum steam generated, lbs/hr	58 000	192 000
Total steam generated, M lbs.	16 482	111 753
Coal consumed, tons (est.)	1 077	7 750

g. Waste Storage

	<u>Equivalent Tons U</u>
Metal Waste reserve storage capacity - T Plant	102
1st Cycle reserve storage capacity - T Plant	319
Metal Waste reserve storage capacity - B Plant	145
1st Cycle reserve storage capacity - B Plant	4
Redox Waste reserve storage capacity	621

2. Activities

a. Redox Processing

The Redox Plant operated at an average rate of 5.1 tons per day producing a record 157.6 tons of uranium for the month. The standard rate for the extraction batteries was 6 tons per operating day until July 24, when the rate was increased to 7 tons per day.

Head-end fission product scavenging operations were not possible during July due to centrifuge difficulties, and it was necessary to operate with three uranium and three plutonium cycles to insure product decontamination.

Operating difficulties experienced included intermittent sticking of the 1-A and 1-S feed control valves, which resulted in shutdowns of short duration on July 7 and July 10. Foaming in the D-4 condensate concentrator also resulted in down time on July 7 and July 13. A scheduled shutdown of 22 hours on July 17 was required for column flushes, installation of a new 1AF jumper, and installation of a D-4 by-pass jumper. The latter item allows continuous jetting of the D-5 overflow, and thus eliminates the troublesome condensate evaporation step which had restricted high rates due to D-4 foaming.

a. Redox Processing (Continued)

Following the July 17 shutdown, operations continued at an uninterrupted 6 tons/day rate until July 24 when the rate was increased to 7 tons/day. This increase was achieved by further concentrating the feed to the 2-D and 3-D columns which allowed a higher feed rate in tons of uranium per day without increasing the volume velocities in the columns. Erratic 1-A column operation, attributed to a solids build-up from non-scavenged feed, necessitated a column flush on July 26. Prior to this flush, four batches of uranium product were produced which did not meet the gamma specification, and they are being held in lag storage for blending with low activity material.

On July 29, the plant was shutdown for the balance of the month to replace the centrifuge, make column and vessel flushes, and make miscellaneous repairs.

b. TBP Processing

The TBP Plant operated at an average rate of 6.8 tons per day at 88.2% efficiency. Feed rates for both lines varied between 3.0 and 6.0 tons per day and were dependent on decontamination performance and waste losses. Sustained rates were not possible due to an apparent build-up of contaminated solids in the columns and process vessels which necessitated frequent and extensive line flushes. One batch of RCU required rework due to poor decontamination. Results of processing 5 tons of 101-BX feed material (minimum cooling age of 2.5 years) on a single cycle test basis were inconclusive due to the generally poor operating performance experienced during this period.

c. UO₃ Processing

Plant operations were normal and production was essentially current with feed supplied by Redox and TBP Plants. A maximum production rate of 17.5 tons of uranium was achieved for one 24-hour period. Radiation levels encountered during pot unloading have increased slightly due to the higher gamma activity of feed material.

d. Waste Metal Removal

Adequate supplies of feed were provided the TBP Plant by the tank farms with UR and TXR Farms producing approximately 90% of the feed material. One of the original open impeller type Nagle pumps (#15) in Tank 106-C failed on July 13. Although in service for 18 months, it had accrued only 375 hours operating time. The first Byron-Jackson (Nagle substitute) pump failed on July 5 after only 73 hours operating time. Examination indicated bearing seizure was the cause of failure in this test unit. The CR Farm was non-productive until July 26 due to slurry accumulator pump troubles and the Nagle pump failure. BXR Farm experienced numerous hose failures and clogging of the 001 sluice pump which reduced production to a minimum.

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d. Waste Metal Removal (Continued)

Waste metal removal was completed in Tanks 102-C and 105-U, and tank 103-TY is currently receiving TBP waste solutions.

e. 231 Building Processing

Isolation Building production was a record high with 304 runs being completed in July. Essentially no equipment or process difficulties were experienced, and all shipping commitments were fulfilled.

f. 234-5 Processing

The July commitment of final shapes was processed in the 234-5 Building RMA Line, and was delivered to the AEC. The rehydrofluorination and casting rejection rates continued to be relatively high. Equipment and operational changes aimed at reducing these rates are being closely followed.

3. Special Operations

a. Waste Evaporation

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

<u>Evaporator</u>	<u>Gallons Feed</u>	<u>Gallons Sludge</u>	<u>Gallons Condensate</u>	<u>% Volume Reduction</u>
242-T	354 794	191 813	162 981	45.9
242-B	119 315	54 923	64 392	54.0

The 242-B waste evaporator was shut down on July 9 with the completion of first cycle bottoms re-evaporation. Evaporation of TBP wastes will begin after the completion of necessary maintenance work. Feed for 242-T was TBP wastes from Tank 109-TX.

b. B Plant Stand-by

Internal acid and water flushes of the Concentration Building equipment were completed on July 23 with 3.4% of a standard run being recovered and processed in T Plant as recycle. External cleaning of the equipment and decontamination of the cells will continue.

c. Pu Recovery - 234-5

The equivalent of 18.2 bottles of product was processed in metal recovery during July, and the equivalent of 25.1 bottles of product was transferred to the Concentration and Isolation Buildings for re-processing.

Processing of the backlog of RG Line scrap metal material (flash and trim, hood sweepings, etc.) and scrap metal from Hood 200 of the RMA Line was completed with a recovery of 82% of the charged weight.

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d. Nitric Acid Recovery - UO_3

The chloride build-up on the furnace off-gas tower absorption plates has recently necessitated increasing the purging frequency from twice weekly to four times daily, and has resulted in a slight reduction in the over-all concentration of recovered nitric acid. This condition stems from the recent reduction of RCU nitric acid concentration which apparently prevents chloride removal before the calcination operation.

4. Schedule Variance

Redox plutonium and uranium production were both records with 135% and 117% respectively of the amount forecasted.

T Plant produced only 67% of forecast due to a shortage of metal resulting from the Redox record production. The combined plutonium production of the two plants was 126% of the July forecast.

The TBP Plant experienced decontamination and waste loss difficulties which resulted in its achieving only 88% of the forecast production.

The UO_3 Plant produced 118% of the July forecast.

The 234-5 Building produced

B. Equipment Experience

1. Operating Continuity

Redox down time of 117 hours was essentially due to a faulty 1-A column feed control valve and D-4 condensate concentrator foaming. Equipment changes made on July 17 corrected these difficulties.

The A Line in TBP Plant was down 98 hours due primarily to the need for line and vessel flushing in an attempt to improve operating performance. Replacement of a faulty Hammel-Dahl feed control valve and a flooded RA system resulting from an operating error contributed to the total down time.

The B Line down time of 54 hours can be attributed to the need for line and vessel flushing in an attempt to improve operating performance.

A total of 658 hours was lost at 241-CR since there was no operable spare to replace the sluice pump transferred to 241-BXR in June.

A total of 289 hours was lost at 241-BXR due to numerous hose failures and clogging of the 001 sluice pump.

Failure of the Byron-Jackson sludge pump on July 5 was responsible for a major portion of the 68 hours lost time at 241-TXR.

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HW-28906

1. Operating Continuity (Continued)

Changing operations between the various tanks was the cause for the 32 hours lost time in 241-UR.

2. Inspection, Maintenance and Replacement

a. Silver Reactors - Redox

The A-3 and B-3 silver reactors were regenerated during the month when I^{131} evolution from the 291-S stack increased to a maximum of 27 curies during one 24-hour period. Emission returned to normal after the regeneration operations.

b. H-7 Agitator - Redox

Condensate in the gallery wall receptacle has caused two electrical failures to the agitator within two months. The source of the condensate has not been located.

c. Redox Centrifuge

Repairs and testing were completed for the spare centrifuge and replacement of the H-2 centrifuge was accomplished on July 31.

d. Byron-Jackson Pump Failure - 241-TXR

Byron-Jackson pump #33 in tank 101-T failed on July 5 after only 73 hours of operation, and Nagle Pump #25 was installed as a replacement. Examinations verified that bearing seizure was the cause of failure. A Byron-Jackson representative is witnessing dismantlement and inspection of the pump before repairs are attempted.

e. Nagle Pump Failure - 241-CR

One of the old open impeller Nagle pumps (#15) failed in Tank 106-C on July 12 due to a short circuit caused by moisture accumulation. Johnston pump #31 was installed as a replacement on July 30.

f. Sluice Nozzle Failures - 241-UR and BXR

Two sluice nozzle failures were experienced at each tank farm. Three of the failures were due to ruptures while the fourth was apparently due to plugging and this unit will be salvaged.

g. Diversion Box Catch Tank - 155-TX

Routine electrode readings of the catch tank at 155-TX diversion box disclosed that the tank had failed. Leakage of nitric acid apparently had corroded the bottom of the tank to such an extent that material was draining to the ground. Replacement will be made with stainless steel tanks.

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h. Waste Evaporator - 242-B

Testing of the evaporator coils disclosed serious leaks in two coils such that postponement of TBP waste evaporation start-up is required until the coils can be replaced.

i. Waste Line Failures - T Plant

A leak was detected in the unencased cell drainage waste line connecting the canyon to the TX Farm. Two other ruptured waste lines were detected during subsequent testing operations. Operations were suspended for seven days until jumper changes established a new route to the 361 cribs.

j. X-12 Fibreglass Filter - UO_3

The X-12 off-gas fibreglass filter ruptured on July 30, and low level uranium contamination was spread over a wide area to the rear of the plant. The filter was changed two additional times during the month.

C. Improvement Experience1. Process Tests and Revisionsa. Revised Dissolving Procedure - Redox

Rotometers for controlled acid addition to C-2 and A-2 dissolvers were installed and have permitted further testing of this method of dissolving. Preliminary data from "C" dissolver indicates that both the acid consumption and the time cycle can be reduced by approximately 20%. One test (run FDR-D-29) in C-2 was carried from the initial heating period past the peak of reaction in 15 minutes without use of cooling water on the pot coils and with very satisfactory control of vacuum.

b. 1-B Reduction - Redox

On July 3 the 1-B column extractant stream was reduced from 70% to 50% of flowsheet to permit increased capacity in the 1-C column. No significant change in fission product distribution has been observed and contamination of the 1-B product stream with uranium has been well below the specification limit. It is estimated that the change should permit an increase in 1-C column capacity of approximately 4%.

c. Pu Cycle Flowsheet Changes - Redox

On July 1 the 3AS:3AF ratio was reduced from 1.5:1 to 1:1 (while maintaining the column L/V at 1.3) to reduce chemical consumption, waste storage costs and to provide for additional capacity in the 3-A column. There has been no apparent drop in 3-A column decontamination and no emulsification troubles have been experienced.

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DECLASSIFIEDc. Pu Cycle Flowsheet Changes - Redox (Continued)

On July 22 the 2-A column scrub flow was reduced from 30 to 20 (relative to LAF=100) with corresponding changes in the other 2nd and 3rd Pu cycle cold streams to maintain the same aqueous to organic flow ratios. The mechanical and decontamination characteristics of the 2-A column have continued to be satisfactory so it is believed that further reductions in 2-A scrub may be possible.

d. Increased 2DF and 3DF Concentration - Redox

On July 23 and 24 the concentration of the 3D and 2D column feed was raised from 60% to approximately 69% UNH to permit more economical operation and higher capacity. The change in concentration permits a 25% reduction in 2D and 3D scrub stream consumption and an increase in capacity to approximately 7.3 T/D. The columns were operated at a 7 T/D rate until July 29 and gave satisfactory results from the standpoint of decontamination and mechanical stability.

e. D-4 By-Pass - Redox

Installation of the D-4 evaporator by-pass was completed on July 16 and by-passing of the process condensate has proceeded successfully since that time. The jet is currently operated on a cycle of approximately 40 minutes, and plans are to make the jetting operation automatic.

f. Waste Metal Removal and Blending

In an attempt to provide more uniformly consistent feed material to TBP, sluicing techniques were altered somewhat in July. All sluicing in 101-TX and 105-U was conducted by using water as a sluicing medium. During blending, supernate from 103-T and 108-U was added to the blends being made with the slurry. This method of operation produced a feed with a more uniform composition than had ever been previously obtained. Additional blending of this type will be made at 241-T.

g. Reduction of Casting Operation Anneal Period - 234-52. Inventions or Discoveries

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

D. Events Influencing Costs**SECRET**

1. Labor Variance

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

2. Material Variancea. Redox Flowsheet Changes

Joint efforts of the Process Technology group of the Separations Technology Sub-Section and the Redox Process Control group resulted in several flowsheet changes influencing cost. The changes and their economic effect can be summarized as follows:

<u>Process Change</u>	<u>Savings in Essential Materials and Waste Volume Reduction, \$/Ton U</u>
3AS Reduction	\$ 24.00 per ton
2AS Reduction	42.00 per ton
2DF Concentration Increase	103.00 per ton
3DF Concentration Increase	103.00 per ton

b. D-4 Evaporator By-Pass - Redox

By-passing of the D-4 evaporator has resulted in steam and raw water savings of approximately \$29.00 per ton U.

c. Revised Dissolving Procedure - Redox

The use of the semi-continuous process for dissolving has resulted in a 20% reduction in acid consumption for a savings of \$22.00 per ton U.

3. Othera. Elimination and Reduction of Analytical Determinations

Substitution of chart readings for laboratory determinations of TBP pooled waste specific gravity and reduced determination requirements for other process samples has resulted in annual savings of ca. \$3,500.

E. Plant Development and Expansion1. Project Status

The Revised Project Proposal for reactivation of the P-10 Facilities was approved by the AEC, and a work authority was issued by the Engineering Department. Work progressed rapidly on rehabilitation of the metal line with installation and relocation of equipment continuing slightly behind schedule due to the delay in approval of the project, lack of complete design, and delays in procurement of materials.

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1. Project Status (Continued)

Installation was started on 241-S Tank Farm condenser modifications required to permit self concentration of Redox wastes.

A change is being made in the Purex canyon concentrator design to insure against explosion hazards and to allow for remote tube bundle replacement because of anticipated high corrosion rates.

Site preparation for the Recuplex Project was completed and construction is now in progress.

The Redox "Interim Phase II Expansion Program", the Redox Waste Tie-Line to U Farm, and the 241-SX Waste Tank Farm are all on schedule.

A study was made of ANN consumption rates under proposed Redox Phase II flowsheet conditions and a recommendation issued to eliminate one of the two 300,000 gallon storage tanks to be provided for this project. Estimated savings are \$100,000.

2. Plant Engineering

Cost Standards at varying production rates were completed for each facility with material, labor, analytical, and power costs being engineered and the remainder being based on historical records.

Standard costs for June production were computed and compared to actual costs by facility and product. Variance reports were prepared and issued for use within the Separations Section.

F. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>
HW-28914	Separations Section - Operations Monthly Report	V. R. Chapman
HW-28913	Separations Section - 234-5 Operations Monthly Report	V. R. Chapman
HW-28922	Separations Section - Process Monthly Report	W. N. Mobley
HW-28931	Separations Section - Radiation Monitoring Monthly Report	A. R. Keene
Restricted	Separations Section - Power and Maintenance Monthly Report	R. T. Jessen
HW-28721	Separations Process Committee Minutes	O. F. Beaulieu

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1. Routine (Continued)

HW-28877	Separations Section - Plant Engineering Monthly Report	C. P. Cabell
HW-28915	Essential Materials - Operations Sub-Section Separations Section	J. P. McBride
HW-28953	Separations Section - P-10 Extraction Unit Monthly Report	O. V. Smiset

2. Non-Routine

HW-28755	Isolation Process Test Program Authorization	W. G. Browne
HW-28676	Metal Fabrication Test Program Authorization	E. G. Pierick
HW-28655	Evaluation of the RMA Line Reduction Yield Basis and the Reduction Process	C. L. Brown
HW-28093	Production Test 235-10 Evaluation of Larger Batch Reductions of Plutonium Tetrafluoride	E. G. Pierick
HW-28588	Radiation Incident, Class I, No. 71	W. G. Westover
HW-28662	Radiation Incident, Class I, No. 72	J. P. Corley
HW-28638	Radiation Incident, Class I, No. 73	D. R. Koberg
HW-28680	Radiation Incident, Class I, No. 74	J. P. Corley
HW-28639	Radiation Incident, Class II, No. 18	A. R. Keene
HW-28854	Radiation Incident, Class II, No. 20	A. R. Keene
HW-28116	Approximation of Energy of Radiation from 240-S-151 Diversion Box	G. L. Helgeson
HW-28868	Notes on Isotope Correction Factor - Material Balance	C. G. Hough
HW-28790	Basic Information for Labor Standards, Waste Metal Recovery, P.E. Report No. 73	R. H. Chesworth
HW-28791	Basic Information for Material Standards, Waste Metal Recovery, P.E. Report No. 74	R. H. Chesworth
HW-28788	Six Months' Post Acceptance Report, T Plant Process Ventilation Improvement	R. S. Himmelright

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2. Non-Routine (Continued)

HW-28792	Six Months' Post Acceptance Report, Project C-198 and Project C-413, 234-5 Building and Expansion of 234-5 Capacity, Respectively	R. S. Himmelright
P.E. Report #77	Chemical Handling for Recuplex	J. E. Fouts
P.E. Report #78	Use of Chemcoat-R for Control of Contamination	J. P. Derouin
P.E. Report #72	Steam Standards, Boiler House, 284-W	C. R. Anderson & F. A. Wonn
Restricted	Survey of Task II Equipment Problems	F. T. Keenan
Restricted	Radiological Safety Experience with RM Line Operation, 234-5 Building	F. T. Keenan & W. G. Westover
HW-28586	234-5 Building Production Capacity	F. T. Keenan & E. G. Pierick
Restricted	Tooling RM Line for Models 110 and 130	F. T. Keenan
HW-28712	Separations Section, Waste Status Summary	D. McDonald by G. K. Carpenter

III. PERSONNEL

A. Organization

There were no organizational changes in the Separations Section in July.

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Section General	5	5	0
Operations Sub-Section	613	608	- 5
Power & Maintenance Sub-Section	571	571	0
Process Sub-Section	200	198	- 2
Radiation Monitoring Sub-Section	73	73	0
Plant Engineering Sub-Section	32	31	- 1
P-10 Extraction Unit	<u>15</u>	<u>17</u>	<u>2</u>
Section Total	1509	1503	- 6

C. Safety Experience

There were no major or sub-major injuries in the Separations Section in July; however, a minor wrist tendon injury dating back to September, 1952,

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C. Safety Experience (Continued)

which involved a General Clerk in the Power and Maintenance Sub-Section, has required surgery and the injury classification has been changed to a lost time case.

The organizational framework for the 1953 Separations Safety Stampede has been completed with E. T. Walsh as General Chairman. The stampede dates are September 1 through October 31, with the award presentation scheduled for November 6.

D. Radiation Experience

In P-10, there was one Class I Radiation Incident (#75) which involved an employee who sustained a contaminated injury in conjunction with other skin contamination.

Two Class II radiation incidents occurred which resulted in (1) a localized exposure probably above the permissible limit to a Process Sub-Section laboratory employee and (2) internal deposition of UO_3 slightly above the permissible limit to an Operations Sub-Section exempt employee during the course of a routine filter bag replacement in the 224-U Building. There were three Class I radiation incidents which included (1) exceeding of batch size in 224-T, (2) unauthorized entry into a canyon cell, and (3) failure of a process waste line resulting in widespread ground contamination with process waste.

Some progress was made on decontamination of the south operating pipe and sample galleries and the craneway in the Redox Plant. Preliminary smoke-test studies in the Redox canyon indicated a serious weakness in the ventilation of the canyon when cell blocks are removed. This deficient ventilation coupled with frequent cell work has resulted in widespread high level surface contamination up to 25 rep/hr on crane and craneway surfaces.

Almost simultaneous failure of the A-3 and B-3 silver reactors resulted in the liberation of 27 curies of I^{131} during one 24-hour period. Following regeneration of both reactors, the emission rate averaged 1.1 curies per day. The monthly average was 3.5 curies per day.

E. Personnel Activities

1. Non-Exempt Information Meetings

The third of the scheduled series of information meetings for non-exempt personnel was held on July 17 with a total attendance of 125.

Informal information meetings, both on and off the job, were continued within the various Sub-Sections.

2. G.E. Supervisory Selection Program

Selection of candidates from two Sub-Sections is currently in progress and evaluation will be made in August.

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3. Conference Leading Training

On July 9 sixteen Separations personnel completed the Conference Leading Training course conducted by Training and Development personnel.

4. Laboratory Technical Personnel

Five lecture courses were held during the month with a total attendance of 146.

5. Radiation Monitoring Training for Power and Maintenance Personnel

Five lectures on the subject content were presented to Power and Maintenance exempt personnel with a total attendance of 15 shift men.

6. Emergency-Disaster Training

Organization of rescue training groups in the various plants is currently in progress with training scheduled to begin in the near future.

7. Visitations

P. R. McMurray visited the American Machine and Foundry Company in New York on July 6 and 7 to discuss proposed decanning facilities for P-10 operations.

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HW-28906

ENGINEERING DEPARTMENT

JULY 1953

TECHNICAL SECTION

The increase in flux of an exponential pile obtained by loading with a layer of enriched slugs was less than hoped for; it appears that to achieve the desired increase by a factor 10 an unreasonable amount of uranium-235 would be required. Consequently, other methods of increasing the flux will be considered.

Buckling measurements have been completed on the dry 6-3/16 inch lattice with 1.176-inch-diameter solid slugs.

Three in-line analytical instruments have been installed in the A line of the Metal Recovery Plant for continuous monitoring of (1) uranium in feed, (2) uranium in waste, and (3) gamma activity in product solution. The first two are working well; the third has been troubled by deposition of ruthenium activity.

It now appears possible to determine total uranium in J-slugs non-destructively by means of gamma ray absorption. This is of importance to accountability problems.

Nickel and cobalt ferrocyanides appear even better than copper ferrocyanide for scavenging of Metal Recovery waste prior to cribbing. The cesium DF is higher, the tolerable pH is higher and the precipitate settles better. Recovery of pure radiocesium from the scavenging agent appears to be a real possibility. By means of an ion exchange resin treatment near 100% recovery was achieved.

A method has been developed for making a round, reproducible weld closure of unbonded, aluminum jacketed uranium specimens for special production tests. Autoclave evaluation of a number of assemblies will follow shortly.

The Radiometallurgy Building was turned over to the General Electric Company on June 29. The first work on irradiated materials has been performed and installation of equipment is in progress.

X-ray examination of a specimen subjected to more than 1000 MWD/T exposure showed no change in crystal structure indicating that recovery of damage occurred at the operative pile temperatures. This behavior is in agreement with previous examination of specimens subjected to lesser total exposures.

A series of uranium fuel elements, which were thermally cycled under temperature conditions simulating those that would exist within a pile, have been examined. The two elements whose core had been treated to 730° C showed a

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definitely altered macrostructure in the center of the element; however, no voids or unusual orientation effects were found associated with this altered core structure. Those elements whose core temperature did not exceed the alpha to beta transformation temperature showed no change in structure or orientation as a result of cycling.

Only one slug failure (group 8) occurred during July. One column of Eisenhower slugs will be examined during early August, along with one column from the C Pile "hot spot" (700 KW/Tube) test. If slugs and tubes appear normal, the level at C, including the hot spot, will be increased about 100 MW.

Production operation with reduced trip ranges on Panellits continued to be satisfactory during July. At D Pile, approximately 30 percent helium was required to maintain the graphite temperature below limits.

An experimental Venturi which can be directly substituted for the orifice in H or DR tube nozzles has been designed and tested. Flow increases up to 7 percent higher than with a 0.313 orifice have been obtained at standard header pressure.

For the majority of the month, the Redox Plant was operated with three uranium and three plutonium cycles. By-passing of the second uranium cycle was not possible since the necessary head-end Zr-Nb scavenging could not be accomplished because of H-2 Centrifuge plow failure. Operation at 6 tons/day instantaneous rate was sustained for extended periods and Uranium Cycle flow-sheet modifications being at month-end gave 7.0 to 7.5 tons/day. Capacity tests of second and third Plutonium Cycles indicated satisfactory column performance at 10 tons of uranium per day.

Operation of the Metal Recovery plant on a 4 to 7.5-year aged feed was continued under essentially HW#4 Flowsheet conditions. Tank farm feed preparation procedures were modified by use of direct transfer and water rather than supernate slucing to lower the phosphate to uranium ratio. Uranium processed by the solvent extraction batteries was 97 percent of nominal design of which 2.8 percent was rework uranium. Column performance during the month was less satisfactory. Recent tests indicate organic quality as the chief difficulty. The RCU steam stripper performance further demonstrated the decreased uranium losses effected by the improved entrainment separation. During the month, calcination operations produced UO_3 containing 125 percent of processing design capacity uranium, 58 percent from TBP-source and 42 percent from Redox. Metallic impurity averaged 188 parts per million parts of uranium compared to 270 for June and 432 for May; the improvement stemming from the use of low-acid RCU feed for the primary concentrators started in June.

After shakedown operational testing of the Purex Prototype Facilities, process testing of the columns was begun with "cold" uranium. Maintenance work scheduled during the recent Hot Semiworks shutdown period has been completed. Operations have resumed though delayed past schedule by the

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necessity of replacing the critical hot feed pump.

Two ultrasonic test units have been put in use on the Metal Preparation production line for determination of satisfactory crystal transformation of slugs. At month end, approximately 20,000 slugs from rods beta heat treated at Fernald had been tested prior to load dip canning. About 60 slugs have been rejected by the test units as inadequately transformed. The cause of the incomplete transformation is being investigated.

Approximately 2,000 slugs were canned with Tru-line cans and well-type, Tru-line caps. Four tube charges were made in the F Pile on July 17. The remainder are scheduled to be charged during August. Canning of an additional 10,000 slugs will proceed upon delivery of additional Tru-line cans and caps from ALCOA.

DESIGN SECTION

Direct Engineering effort of the Section for July was distributed approximately 66% to the expansion program, 16% to other design projects and 18% to research and development studies.

Design progress on Project CA-512-R, 100-K Reactor Facilities was advanced 3.8% during July to 95.1% complete. Fabrication of the model of the 100-K process unit is proceeding with excellent progress being made. It was decided to replace the front face orifices with venturi tubes in the central zones and double orifices in the fringe zones.

Detail design of the 200 Area Expansion Program, Project CA-513, continued. The Purex Waste Facility advanced 13% during the month to 50% complete; the Purex Outside Facilities design advanced 2% during the month to 88% complete; the design of the Metal Conversion Plant expansion advanced 1% during the month to 98% complete.

The scope of the Purex concentrators was revised to specify remotely removable tube bundles of the bayonet or canister type to minimize replacement costs and down time due to tube failures. Approval was received from the AEC for fabrication of a representative scale model of the 202-A Process Building. The work will be done by the Graphics Unit and is scheduled to be complete by October 1, 1953.

Detailed design work on the 300 Area Expansion Program, Project CA-514, exclusive of the addition to the 313 Building structure and services, which are being done by an A-E, was advanced 10% during the month to approximately 52% complete. Design activities were concentrated on the 313 Building process equipment and remodeling of the existing structure.

Detailed design of the Recuplex installation, Project CG-496, is approximately 95% complete, an advance of 5% during the month. The transfer line system between Task I and the hoods was simplified and was made possible

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by a modification of requirements by the Technical Section and Manufacturing Department.

Design work on Project CG-549, the Activation of Task I, Building 234-5 is approximately 14% complete, an advance of 4% during the month. A drawing schedule of 94 drawings was prepared and issued. Estimated design completion date is January 15, 1954.

Detail design on Reactivation of P-10 Facilities, Project CG-550, advanced 30% during the month to 65% complete. Thirty-one drawings were issued for approval and 55 have been issued for comment, out of 97 required drawings.

Design work on Project CG-551, Expansion of Building 234-5 Facilities was advanced to approximately 10% during the month. Revision of the Project Proposal is in progress.

Design work on the Hot Semi-works Conversion advanced to approximately 9% complete. Design effort was primarily applied to following scoping being performed by the Technical Section and to the preparation of advance ordering of materials. About 60 drawings will be required by the Design Section.

Research and development work on preliminary scoping of Reactor Plant Modifications for increased production was started. A study stage proposal requesting \$100,000 for the initiation of project design work was submitted to the A & B Committee on July 21, 1953.

PROJECT SECTION

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox Production Plant, 1%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.8%; CG-438, Ball Third Safety System, overall, 96%; CG-496, Recuplex, 19%; CA-506, Repairs to 100 Areas Retention Basins, overall, 99%; CA-512, 100-K Area Facilities - Water Plants, KW, 26%, KE, 18%, Reactor Buildings, 105-KW, 17%, KE, 10.7%; CA-513, Purex Facility, Part "A," 5.7%, Part "B," 38%, Part "C," 99%; CA-514, 300 Area Expansion, overall, 7%.

Procurement difficulties on three orders threaten delay in the K Area construction program: To date, acceptable process tubes have not been produced by the vendor; the procurement of limonite with current vendor has been cancelled because of failure to meet specification; as yet, a purchase order for procurement of the horizontal safety rod drives has not been awarded.

The five-week dispute between Blaw-Knox and the Plumbers' Union was concluded the week ending July 10, 1953. Blaw-Knox agreed to reinstate the four previously discharged foremen and to use expeditors while hauling piping materials. A jurisdictional dispute between carpenters and Sheetmetal Workers caused a work stoppage by seven Sheetmetal Workers on July 2. Even though the local union called the strike a "wildcat," it spread to include all Kaiser Sheetmetal Workers. The union returned the strikers to

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work on July 8, 1953. One phase of the jurisdictional dispute between millwrights and machinists in 2101 Building was temporarily settled during early July by assigning the changing of cutters to millwrights and allowing machinists to stand by. Following a walkout, picket lines, and more negotiation by millwrights, work was resumed on July 29.

In the 100-K Area Water Plants, concrete and form work was continued in the 181-KE, 165-KW, and 190-KW Buildings. Installation of flash mixers was started in the 183-KW Filter Plant. The fabrication of biological shielding crates for the new Reactors is proceeding at the rate of two per week. There is possibility of considerable delay because of slow procurement of process tubing, limonite ore, and thermal shield blocks. The contractor is also having difficulty in leveling the base membrane plates because of extreme variations in temperature.

Graphite milling began on July 29, more than a month later than originally scheduled. The hardness of this new graphite reduces production through the Sunstrand mills to about 1/3 of that realized in milling of graphite for the 100-C Reactor. Progress toward completion of the 2101 Building structure and the installation of equipment was very slow.

The concrete floor pad for 202-A Building was essentially complete. The contractor is completing monolithic structural sections at the rate of two per day. The lump sum portion of the railroad was completed and accepted. Temporary construction for Purex was almost completed. Construction for UO₃ Expansion progressed to 38% complete. Material for the Recuplex Facilities is being prepared for shipment to the fabricator, and the first order for Purex Vessels was placed. For the Redox Capacity Increase, Phase II, architectural engineer design was 48% complete, and G-E design 46% complete. Design of the Redox Tank Farm, 241-SX, remained at 93%, and overall construction was 4.7% complete.

ORGANIZATION & PERSONNEL

Total on Roll, July 1, 1953	1,555
Accessions	36
Separations	<u>22</u>
Total on Roll, July 31, 1953	1,569

P. H. Beaton
for
A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SUB-SECTION

JULY 1953

During the month the following major contract activities were handled:

1. During July the Commission was requested to modify a directive covering moving picture production to agree more nearly with the contemplated production of training films, and also to allow the negotiation of a contract with a single film processing company rather than advertising for bids. As of July 31, the Commission has not answered General Electric's letter or modified the directive, but action is expected in this matter during August.
2. A lease agreement covering the rental of short movie subjects for the Safety and Fire Protection Unit has been approved and will be sent to the Lessor for signature in the near future.
3. General Electric's recommendation of award of a contract for printing of the Richland telephone directory by the General Telephone Directory Company of Long Beach, California, was sent to the Commission early in July. Justification for separating the commercial and residential directory from the Plant directory was forwarded to the Commission in response to their request for such justification. The question of publishing two directories is being studied by the Commission, but as yet no approval or comment has been received from them.
4. Special Agreement No. G-28 between the General Electric Co. and Industrial X-Ray, Incorporated, covering X-ray services in connection with a downcomer being fabricated at the Bremerton Navy Yard, was executed by the contractor on July 24, 1953, and work under this contract started immediately. Conformed copies of the contract were issued July 28, 1953.
5. Special Agreement No. G-30 between General Electric Company and Charles Bruning, Inc. covering the quarterly servicing of whiteprinting reproduction equipment was executed by General Electric and sent to the subcontractor for signature July 29.
6. Special Agreement No. G-31 between General Electric Company and Abadan-Spokane covering the quarterly servicing of Ozalid reproduction equipment was written and is in the Finance Department for approval prior to execution by General Electric.

As a result of a review of the current activities of Classified Files, agreement was reached between the Departments concerned on proposed functions and responsibilities of Classified Files. The principal changes to be effected are as follows:

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1. Destruction of reproducibles of classified documents will be performed by the reproducing agency in the future.
2. The mail activities presently performed by Classified Files in connection with registered delivery mail and delivery of unpackaged classified documents will be relinquished to central plant mail activity.
3. Responsibility for correcting or changing classified documents will be the authors' in the future.
4. Centralized control of classified photographs will be transferred to the Photo House as soon as the photographic activities are moved inside the 700 Area perimeter.
5. Destruction of classified scrap will no longer be handled by Classified Files; this function will be handled instead by patrol.
6. The current audit and inventory program will be reduced to provide:
(1) The required annual inventory of Research and Development Reports classified secret; (2) making such inventories of non-Research and Development Reports as time and staff permit.

It is anticipated that a substantial reduction in the size of the Classified Files staff can be accomplished as a result of these changes.

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PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JULY, 1953

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SECURITY INFORMATION

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R. W. Lockhart visited here July 9 through 17, from Knolls Atomic Power Laboratory, Schenectady, New York, in order to obtain some appreciation of the problems of running experiments or tests in operating piles.

N. E. Huston, W. K. McCarty, and O. R. Smith visited here from North American Aviation, Inc., Downey, California, July 20 through 23, to obtain information on reactor safety project and to attend a meeting on the reactor safety project.

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

D. R. Smith visited here July 21 through 23, from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, for consultations on the Neutrino Program.

W. E. Cawley visited the Huntington Rubber Mills in Portland, Oregon, July 10, to discuss rubber fabrication techniques.

M. Lewis attended the Gordon Research Conference on Corrosion in New London, New Hampshire, July 18 through 23.

J. F. Music and W. C. Riley visited Battelle Memorial Institute in Columbus, Ohio, July 9 and 10, for technical consultations on properties of irradiated graphite.

J. M. Skarpelos visited Washington Power Filter Plant in Clarkston, Washington, July 22 and 23, to observe start-up of silicator unit.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	<u>June</u>	<u>July</u>
Administrative	4	4
Pile Engineering	81	82
Pile Materials	66	65
Special Irradiations	<u>24</u>	<u>24</u>
Total	175	175

Pile Engineering: One Physicist was hired in.

Pile Materials: One Junior Engineer transferred to Separations Technology Sub-Section.

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PROCESS TECHNOLOGYPower Level Limits

Power levels were limited by both vapor binding, tube outlet temperature and graphite limits except at C and DR Piles. C Pile was operated during the month at a fixed maximum power per tube as part of the program to explore the possible slug rupture dangers of increased local power generation rates. DR Pile was operated at a fixed maximum power per tube because of the DR-10 special loadings of fuel and target slugs; however, almost the maximum allowable percentage of helium was required to control the graphite temperatures. B and F Piles, operating on excess header pressure limits, were limited by vapor binding with graphite temperatures controlled by relatively small additions of helium. H Pile, which is on the trip before boiling basis, was limited by tube outlet temperatures in the center and graphite temperatures in the fringe even with 30 per cent helium addition. D Pile, operating under production test conditions was limited by outlet temperatures.

Slug Rupture Experience for July

One slug rupture occurred during July. This was a side failure of a Group 8 Metal piece in the central zone at H Pile.

To date this year there have been 18 uranium slug ruptures in Hanford piles as compared with 95 for the same period in 1952. However, the fact that the rate of metal through-put has increased substantially discloses a present 1953 rupture rate approximately one-tenth that for the first seven months of 1952.

The performance of the Group 9 Metal continues to show improvement over the Group 8 Metal with a present rupture rate less than one-fourth the rate for the best Group 8.

The rupture experience to date at C Pile indicates that there are no gross effects due to the present high tube powers.

Zone Charging of Reject Slugs

The results of a study made to investigate the possibility of relaxing the inspection criteria for slugs charged in the low temperature, low power regions of the process tubes are presented in HW-28669, "Zone Charging of Reject Slugs". It is recommended that a secondary inspection of slugs be considered for specified types of rejects when charged in the front eighth of the process tube.

Higher Specific Power Operation

Production Test 105-532-A-2: Increased specific slug powers are being obtained by the irradiation of uranium slugs enriched to 1.75 per cent U²³⁵. Operation was routine during the month with maximum slug powers varying between 50 to 55 kw/foot of uranium, an equivalent tube output of 770 to 850

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were these slugs the maximum power slugs in a tube with cosine distribution of slug powers. At these powers, end-cap boiling is calculated to have taken place for the last three months. One of three tubes is to be discharged for inspection early in August.

Production Test 105-533-A: The effects of increased tube powers localized in a central region of about 100 tubes in C Pile are being investigated by changes in the poison arrangement. Fifty tubes are now being operated at from 10 to 17 per cent above the 600 kw per tube limit outside the experimental zone. The slugs and process tube which have been operating at highest power will be inspected on the next outage.

The inspection of the slugs and process tube from the highest pilot zone tube and of the enriched slugs and the corresponding section of process tube will determine the feasibility of increasing the tube power limit at C Pile.

Operation with Maximum Panellit Pressure Protection

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

An experimental Venturi which can be directly substituted for the orifice in H or DR tube nozzles has been designed and tested. Flow increases up to seven per cent higher than with a 0.313 orifice have been obtained at standard header pressure.

PILE PHYSICS

Pile Enrichment

Four enriched columns utilizing J pieces alternated with aluminum dummies have been charged into the DR Pile to compensate for depletion in the current P-10 program loading. Most of the aluminum dummy columns within the loading were charged with natural uranium at the same time to provide sufficient excess reactivity for compensating depletion during the next operating interval. A reactivity test on the proposed J dummy loading pattern performed in the test pile by the Experimental Physics Sub-Unit indicated a column strength approximately two-thirds that of a C column.

Approval by the Atomic Energy Commission for enrichment of C Pile is still pending. The enriched material charged at start-up, to augment C Pile reactivity, is due to be discharged in the next few weeks. Failure either to replace these columns or to proceed with full enrichment of C Pile will have an adverse effect on flattening efficiency.

Pile Control Studies

The relaxation method if being employed to achieve a more exact solution of the safety control capacity of the 29-rod piles in case of a cold, dry,

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Pile Technology Sub-Section

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xenon-free condition. This method is being undertaken following results from the enrichment calculations, described previously, which indicate the available control in a 29-rod pile is barely sufficient for an unenriched pile.

Soram Transient Studies

Work on evaluation control capacity by analysis of soram transients continued during the month. Soram transients were recorded in the test pile for both the horizontal rod and the vertical rod with different initial rising periods. These preliminary tests are being used to check the reliability of the instruments and to attempt to reproduce similar test pile measurements performed previously. Further test pile measurements and data analysis are contemplated before the attempt is made to use similar techniques in the production piles.

Exposure Calculations

Tables of factors for U²³⁵ burnout, U²³⁶ buildup, and Pu²³⁹ buildup in "E" metal slugs (uranium enriched to 1.75 per cent U²³⁵) were completed for SF accountability use. The factors were based on an assumed cosine distribution of the flux from front-to-back and on the basis of exposure to a flux equivalent to that incident on the surrounding natural uranium columns.

The total iodine content of irradiated uranium just prior to chemical processing was calculated. In waste disposal and radiation monitoring the amount of stable as well as unstable iodine isotopes are of interest. Calculations are being made to determine the total fission product activity due to the zirconium-niobium chain as a function of column exposure rates.

The heat generation rate of a 1.27-inch diameter slug of natural uranium relative to that of a standard 1.37-inch diameter slug exposed to an equivalent flux was calculated for the Heat Transfer Sub-Unit.

SHIELDING STUDIES

Attenuation Measurements

Considerable effort is being spent investigating the dependence of shield effectiveness on the iron-hydrogen ratio of the shield. This information is important for designing the optimum shield from the standpoint of both shield economy and shielding effectiveness and for predicting the effects of thermal and radiation damage.

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Neutron attenuation measurements have been initiated in magnetite concrete under Supplement C of Development Test 105-434-P. Both bare and cadmium-covered gold foils are being used in order to obtain thermal flux measurements in one exposure interval. Fast neutron data will be obtained during the next operating period.

Conventionally poured magnetite-limonite slabs were placed in the large oven at 189-F to be heated to 100 C for approximately two months. Iron masonite slabs are to be modified structurally to increase the iron to hydrogen ratio prior to further attenuation measurements.

Operation of the C File Bulk Shielding Facility is expected to start within the next two months. A development test covering the initial operation and calibration of the facility is being prepared. "Project Neutrino" experimental equipment and associated shielding is to be removed from the X-2 level soon.

Detection Techniques

Absolute counting has not been required in attenuation measurements but is required in order to describe the data in terms of absolute flux levels. A literature survey has been undertaken to compile available information on absolute beta counting.

Exposures of sulfur and sulfur compounds were made in the E Test Hole in order to compare chemical yield data with observed beta counting rates of phosphorous 32. Initial data showed a wide spread; more and larger samples will be similarly treated in an attempt to obtain consistent results.

Gamma counting of gold foils used for thermal neutron detection is being considered because of the appreciable effect on beta counting rates from small differences in foil thickness. A shelf attachment is being constructed for scintillation counting which has similar geometry to the mica window GM tube assembly and which will accept the same aluminum slide sample holders. A gain stabilizer circuit developed by the Experimental Physics Sub-Unit is to be added to the circuitry in the near future.

Radiation and Thermal Damage Studies

Three experiments are being initiated which should provide a considerable amount of additional information showing the effects on masonite of radiation and thermal exposures. The first will be exposure of a five-foot stack of masonite squares over a region of varying flux in the water-cooled Y Test Facility at H File. The second experiment will consist of exposing a number of masonite samples to various temperatures in a helium atmosphere. Charring of samples previously exposed to high temperatures in air has prevented evaluation of the postulated thermal deterioration constant. The third experiment will be a combination temperature and gamma radiation exposure. Good data have previously been obtained on gamma exposure effects alone which appear to behave in the postulated manner.

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Measurements have started at C Pile under Production Test 105-543-A, issued during the month, to observe the effects on masonite temperature of displacing natural uranium slugs into the front shield. The effect of the air gap between the biological and thermal side shields will also be a part of this study on masonite temperatures.

Data on the compressive strength of concrete as a function of heating to temperatures of 100 C, 150 C, and 200 C have been obtained over an interval of approximately 100 days. These data indicate that although definite losses in compressive strength occur at elevated temperatures, an equilibrium strength is approached after extended exposure to a given temperature. The iron limonite concrete and limonite magnetite concrete show comparable long-term effects; however, the changes in compressive strength observed during the first few days at elevated temperatures were not consistent between the two concretes. Both sets of samples were first cured in water for 28 days; however, during the first few days at elevated temperatures there is a competing reaction between thermal damage and accelerated curing.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

The experimental prototype of the scintillating crystal gamma ray spectrometer slug rupture detection system, which was developed as a replacement for the inadequate beta monitoring systems in the full pile effluent monitoring application, continued to operate routinely at the H Pile. The prototype installation is routinely monitoring effluent from the near side of nine cross-headers and is performing essentially as 25 per cent of a full H Pile installation. It is planned to continue prototype operation to (1) gain continuing operational experience regarding component stability, (2) provide experience for Instrument Maintenance with this equipment, (3) facilitate testing of design refinements, and (4) provide added pile protection with the equipment presently available. The H Pile installation continues to indicate the presence of further ruptures, probably in the enriched uranium-aluminum alloy C slugs, in the process tubes associated with crossheader No. five.

Discussion with Reactor and Design Section personnel have firmed the approach to be taken in replacing the existing beta systems with gamma monitoring installations. The effluent monitoring system replacement at all piles except KE and KW will be effected through a single project; the proposal is now being prepared. In addition, the H Pile installation will be expedited to completion in advance of the mass replacement effort to give earlier protection at that pile and to give detailed experience with problems of design and equipment procurement which will assist in accomplishing the remaining installations. Detailed technical liaison with Design and Reactor Section personnel has been established and is expected to continue through all phases of this effort.

An operating manual for the prototype gamma monitor has now been completed in rough draft form. This manual describes the operation of all components in detail and is expected to provide the information required by plant forces to accomplish system maintenance on a routine basis. This manual will also apply to full pile monitoring system maintenance with but minor modifications.

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Neutron Distribution in a Hanford Lattice Cell

The limited experimental time available in the test pile drastically curtailed the programmed efforts to determine the distribution of neutrons in lattice cells containing fuel elements varying in size and enrichments. Components have been designed and fabricated to permit neutron distribution measurements in natural uranium slugs, Eisenhower slugs, i.e., uranium containing two and one-half times the normal U²³⁵ concentration, and through the graphite portion of the lattice as soon as test pile time can be made available.

Preparation of a formal report describing the distributions of fission and plutonium producing reactions in the standard Hanford lattice is continuing. Detailed intercalibration of the uranium detectors has substantially reduced the relatively small uncertainty associated with these measurements which previously existed.

Radio-Isotope Analysis

A knowledge of gamma radiation resulting from the neutron irradiation of pile materials is of importance to Technical and Manufacturing programs in that radiation levels dictate design and operational criteria regarding the handling of irradiated materials and, in some cases, influence strongly the mode and cost of irradiation. Gamma ray spectroscopy is a particularly flexible and powerful tool in this type of study and is being used to the maximum extent feasible.

Several samples of irradiated OSF graphite have been studied in an attempt to isolate the gamma emitting impurities. The major portion of the induced gamma activities in these samples have been demonstrated to result from surface contamination rather than volume contained impurities. Irradiations specifically designed to circumvent the contamination problem are scheduled.

The elemental purity of the basic aluminum and lithium used in the fabrication of the lithium-aluminum alloy slugs for the DR-10 program is apparently less than that realized in the fabrication of similar material for the H-10 program. Process shielding and operational procedures in P-10 separations were adequate for the less radioactive H-10 material but may require extensive modification to cope with the low purity DR-10 material. A joint effort with Special Irradiations Sub-Unit has been initiated to identify the offending impurities. The data now available indicate that the DR-10 material contains a higher abundance (about three-fold) of low energy gamma emitters as well as appreciable quantities of higher energy components not found in the H-10 material.

Efforts to isolate the impurities in bismuth and 2S aluminum are continuing.

Instrument Development

Dumont type 6292 photomultiplier tubes are being tested as replacements for RCA 5819 tubes in the scintillating crystal gamma spectrometers. The standard Harshaw sodium iodide canned crystal coupled with a Dumont photomultiplier yielded a resolution of 8.5 per cent as measured with the Cs¹³⁷

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photoline which is to be compared with an average of ten per cent for the RCA tubes. Tests are now under way to determine the operating characteristics and to investigate the long time stability of the Dumont tubes.

The Oak Ridge model of a pile period monitoring circuit has been obtained, slightly modified, and is now being constructed for performance testing. A gamma compensated ionization chamber has been obtained for use in the period monitoring circuit to provide the gamma independent response required to monitor adequately low power levels in a pile possessing a history of high power level operation. The adequate performance of this instrumentation will contribute substantially to increased safety of Hanford pile operation.

Fast Neutron Flux Monitoring

The initial measurements of the distribution of fast neutrons in the Hanford lattice using threshold detectors were lost as a result of the cooling system failure in D Test Facility at F Pile. A series of measurements to determine the fast neutron distribution through the pile fringe and reflector regions was initiated utilizing the E Test Facility at F Pile. It is believed that meaningful information can be extracted via the threshold detector technique even though the basic data describing the behavior of the reaction cross section with energy are not very accurate or detailed in most cases.

Several nuclear emulsion exposures have been made in the test pile to explore the potential of this technique of spectrum measurement and to gain experience in working with emulsions. Facilities are not presently available to permit accurate and detailed work using this technique to proceed beyond the exploratory stage.

Automatic Tube Outlet Water Temperature Recording Facilities

The Flexowriter automatic tube outlet water temperature recording facilities installed at H Pile in support of the enrichment program operated routinely as did the improved Flexowriter facilities installed at B Pile. The latter facilities are prototype facilities for installations at the remaining areas which are sponsored by Reactor Section. The Flexowriter facilities at C Pile have been installed although specifications have not yet been met by the vendor in several particulars.

The contemplated operation of the Hanford piles with exit water temperatures in excess of 100 C will require modification of the Flexowriter recording system to permit three digit temperature recording. The necessary modifications to equipment are now being designed. A formal report describing the Flexowriter system development and operation has been prepared.

Test Pile - Routine Tests

Regular slug testing proceeded routinely during the month. Twelve lots of Fernald billet eggs were tested yielding TDS values ranging from 13 to 17. Three of the 12 lots of lithium-aluminum alloy slugs tested were rejected as not conforming to specification.

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Test Pile - Graphite Testing

Reactivity measurements were completed on 32 heats of TS-GRF material produced under contract G-5 with two heats allocated red, two allocated blue and the remainder allocated green. One heat of GRF graphite produced by Speer was tested to yield a quality quite comparable to the average National Carbon production material.

Test Pile - Special Tests

Measurements were made of the reactivity associated with the use of a column alternately containing enriched uranium-aluminum alloy (J metal) and solid aluminum slugs in a 105 Pile fringe enrichment application. This loading is approximately 30 per cent less reactive than a C metal loading of equivalent length.

HEAT TRANSFER

Tube Flow Studies

It has been recommended by Technical Section that an additional process tube flow monitoring system be installed on each pile to supplement the Panellit system. Extensive studies have been conducted to determine the instrument most suitable for this purpose. The investigation has been narrowed to three instruments; a Panellit gage, a Meletron pressure switch, and a Mercoid differential pressure switch.

The on-pile test of Meletron switches has continued sporadically with two significant developments. First, it has been found that the electrical resistances of the switch components varies with several different factors. This variable resistance would necessitate some modification of the electrical circuit if Meletrons were used as the safety system to supplement the Panellits. In addition, this resistance factor is preventing the insertion of the switches into the pile safety circuit for testing purposes. Second, the pressure fluctuation dampeners which were used with the Meletrons and which became clogged with oil have been removed. The difficulties associated with these problems are being overcome, and additional testing should be resumed soon.

On-pile testing of the Mercoid switches has also continued. The most significant information gained from this test is that several minor design modifications would be required before these switches could be used in a pile safety system.

Tests have been conducted on the full-scale mock-up which show that the pressures in the outlet Parker fittings of the old piles are below those in the adjacent crossheadings. This pressure differential causes boiling in the fittings when the tube outlet temperatures exceed a value on the order of 65 C. Consequently, it appears that such boiling may exist in the fittings of many pile process tubes now and attempts are being made to verify this belief. The steam formation does not cause unstable flow conditions below outlet temperatures of 100 C or higher, but it could lead to serious corrosion of the fittings. Further studies will be made and the results will be published subsequently.

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Preliminary, experimental measurements have been made at the B and H Piles to determine the pile heat output following a scram. The initial results indicate that the output is greater for the first several seconds than indicated by calculations based on theoretical considerations. Since the consideration is important from the standpoint of pile cooling following an electrical outage, further tests will be made.

Fuel Element Studies

Four more slugs were thermally cycled to axial temperatures near or above the beta transformation point (about 665 C). Previously, it has been reported that a dimensional change was observed on slugs cycled above the point. The purpose of testing these four slugs was to determine whether the dimensional change was the result of exceeding 665 C or whether the change was due to some other effect. Consequently, two of the slugs were cycled to about 650 C axial temperature and the other two were cycled to about 725 C. The results indicated that the dimensional changes for the slugs cycled below the transformation point were about 50 per cent to 75 per cent as great as those for the slugs cycled above the point. Thus, all of the preliminary data obtained to date indicate that there is no radical effect as a result of thermal cycling to temperatures above the transformation point.

The effect of end pressure on the dimensional changes of the cycled slugs was also investigated. It was found that, over the range from 1200 to 2500 pounds end force, end pressure had little effect.

The four specimens previously cycled "above" the beta point were split, polished, etched, and photographed by personnel of the Metallurgy Unit. The examination confirmed that three of the slugs had been taken above the point, but confirmation on the fourth could not be obtained. The specimen which had been taken to an axial temperature of about 740 C had been transformed over about a one-half inch core at the axis.

In order that the slugs can be cycled to higher temperatures and that they can be held at the high temperatures for longer periods of time, additional current generating capacity must be obtained. Consequently, a project proposal authorizing the installation of additional equipment in the 189-D Building is being prepared in co-operation with Project Engineering personnel. It is anticipated that this equipment may be available in about seven months.

Preparations are being made to install a thermocouple slug in the F Pile during the August shutdown. This slug will have two couples mounted on the surface and one at the end cap. The corrosion test of a prototype has been proceeding very satisfactorily and no excessive corrosion has been noted.

An investigation is being made to determine the changes in water flow through a tube due to variations in the allowable tolerances of slug diameters, tube diameters, and rib heights. Preliminary calculations indicate that the flow from one tube to another might differ up to ten per cent for a constant tube pressure drop. These data will be of importance in explaining why the flow rates are not constant from tube to tube in the pile and possibly in correlating corrosion data.

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Calculations are being made to establish basic design criteria for hollow slugs cooled both internally and externally.

Graphite and Other Studies

"Calculated Temperature Distributions in a Graphite Lattice - Report No. 1", S. R. Fields, HW-28725, July 15, 1953, was issued. The report presents calculations made in an effort to postulate the graphite temperature distribution for gas atmospheres of 100 per cent CO₂ and 86 per cent CO₂ - 14 per cent He. The purposes of the report are to (1) summarize the difficulties involved in graphite temperature calculations, (2) emphasize the need for additional data on pile conditions, and (3) present preliminary results. It is anticipated that the latter will prove beneficial even though the accuracy of the calculation is relatively low.

As a part of the investigation to determine the effect of higher tube outlet temperatures on the outlet piping, the pressure at the top of the D Pile downcomer was measured. It was found that this pressure was about 12 psi absolute. Thus, steam will be formed in the downcomer at temperatures below 100 C. The complete significance of that fact has not been evaluated as yet. However, it would appear possible that excessive corrosion of the downcomer could occur if the water temperatures were high enough to cause boiling.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

Charging studies this month have been limited to a determination of the effect of cocked slugs on flow resistance, or pressure drop, through the tube. By misaligning the charging machine, it was possible to get a column of slugs which were nearly all cocked. Measurements indicated such gross cocking caused flow reduction of approximately ten per cent. The magnitude of this flow reduction is large enough to warrant further study and verification.

Horizontal Rod Studies

Fabrication of the modified horizontal rod is continuing at the B Area shops and will be completed soon. The pressing equipment for making the control tubes is being assembled and the control tubes will be ready when the rod shell is complete. Some difficulty has been encountered with the round, polished section of the rod which will pass through the seal. It was found that this portion of the rod was not within roundness specifications and serious scratching has resulted.

An experimental program is being undertaken by the Metallurgy Section at KAPL to evaluate the possibility of extruding control tubes which will be clad inside and out with 2S aluminum. The "meat" of this sandwich tube would be a mixture of Al and B₄C.

The experimental washer seal undergoing tests at 105=C Pile has continued to leak at approximately 2.5 cubic feet per hour. It is believed that this

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leak is the result of fouling in the seal by the lubricant which is normally used with the sphincter seals and which was not completely removed when the washer seal was installed. An inspection will be made at the next outage to determine the exact cause.

Vertical Rod Studies

Testing of the proposed segmental metallic ring seals has been terminated because of the poor performance demonstrated. Serious galling was experienced when the simulated rod section was cycled through the prototype seals.

Testing of minor components of the vertical safety rod system for K Pile is in progress at the White Bluffs Test Tower. The major components will be installed and tested as they arrive.

Supplemental Control

Testing of the "Ink" system is still being held up because of lack of reactivity at the DR Pile. Several leaks were discovered in the system which must be repaired before testing can resume. It appears that the control solution, potassium tetra-borate, is prone to leak through screwed fittings.

Process Tube Pressure Limits

Preliminary tests have been run to determine the bursting strength of irradiated process tubes. Comparisons have been made with new tubing and it has been found that very little difference exists. New DR, and H type tubing burst at approximately 1800 psi while sections of tubing from the pile burst at from 1400 to 1600 psi. The difference is attributed mainly to scratches which the tube received when it was removed from the pile. These tests will be extended to include samples of tubing from all parts of the piles to check the effects of varying degrees of irradiation and corrosion.

Materials Testing Reactor Test Facility

The responsibility for making the scope studies and sketches for the proposed Materials Testing Reactor Test Facility has been assigned to the Mechanical Development Sub-Unit. This facility will make possible irradiation of Hanford fuel elements in fluxes several times greater than possible here. Preliminary studies have been made by the sponsors of the facility and are now being reviewed.

Lattice Test Reactor

Two engineers from the Mechanical Development Sub-Unit have been assigned to work with Applied Research personnel on development of components for the Lattice Test Reactor. Preliminary studies of the proposed control systems are being made prior to start of actual design.

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SPECIAL IRRADIATIONS

The in-pile assembly for studying the effects of radiation on boron carbide control rod and shield components for SIR (KAPL 114) is ready for charging in C Pile. The rate of generation of fission gases from a small sample of U235 (KAPL 108) has decreased. The p-type germanium crystals bombarded by fission fragments (KAPL 115) continues to generate small electrical currents and operate in a stable manner. Although all creep samples in the experimental assembly for studying the creep rate of fuel pins for SIR (KAPL 105) have ruptured, this experiment will be continued to obtain data pertaining to the in-pile performance of the heater used in this assembly. The performance of this heater to date has been significant.

Gamma irradiation of materials for the GEL 100 program have been discontinued. Experimental studies by personnel from the Los Alamos Scientific Laboratory directed toward the detection of the neutrino have been discontinued on the X-2 level at C Pile. These may be resumed in another location at C Pile at a later date. Probable detection of the neutrino has been reported. Out of pile studies pertaining to the creep of zirconium (WAPD 111) are in progress at B Pile. The assembly incorporating the creep sample will be charged when these studies are completed.

Data obtained to date indicate the DR-10 slugs will be definitely more radioactive than the P-10 slugs. It has been established that long half-life materials whose amounts cannot be established analytically without great difficulty will contribute significantly to this higher activity.

The thermocouple slug in F Pile continues to operate. A general decrease in the temperatures indicated by the thermocouples in this slug is attributed mainly to insulation failure.

A new magazine facility is being fabricated for F Pile. The initial temperature distribution studies in the magazine facility at DR Pile are nearing completion.

Isotope production and irradiation of materials for off-site and Hanford programs continue.

GRAPHITE STUDIESRadiation Induced Reactions

As part of the program to investigate the effect of radiation on the chemical reactions of graphite and various gases, a series of samples was exposed to the intense gamma flux created by the spent fuel elements of the Materials Testing Reactor at Arco. A total of twelve samples, three samples of four different systems, were exposed for a period of 15 weeks between March 23 and July 7 in the canal at the Materials Testing Reactor. A special rack was fabricated which contained the spent fuel elements as well as the gas samples. At the end of each operating cycle, about three weeks in duration, the spent fuel elements in the rack are replaced by freshly discharged elements. During the three week period, the gamma flux

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decays from about 10^7 to 10^6 r/hr. The following systems were exposed: (1) carbon dioxide plus graphite, (2) carbon dioxide, helium, and graphite, (3) oxygen plus graphite, and (4) pure carbon monoxide. Each system was loaded at approximately one-half atmosphere pressure, and in the case of where graphite was involved, the graphite samples were individually weighed. Of the four systems, only the pure carbon monoxide system showed any appreciable change in pressure. Visual examinations of all three samples of this system showed a granular solid had been formed. Pressure measurements show a decrease in pressure of approximately 70 per cent. This is greater than any previously exposed samples either in pile exposure or cyclotron exposure. Analyses of the residual gases and of the solid will be obtained. In addition, thermal decomposition runs will be made on the solid residue.

Pressure measurements on the systems containing graphite showed no appreciable change with exposure. However, in each system, a considerable weight loss in the graphite samples was observed. Weight losses of almost 0.03 grams was observed for the oxygen graphite system. This amounts to about a 0.075 per cent loss. Weight losses for carbon dioxide-graphite and carbon dioxide, helium-graphite systems were about the same, amounting to about 0.05 per cent loss.

Analyses of the residual gases will be made on these systems.

It is evident from these preliminary measurements that gamma flux contributes heavily to the gas reaction involving components of the pile gas and graphite.

Radiation Distortion and Graphite Density

The graphite density is one of the most important characteristics of a graphite moderator. In consideration of possible future trends toward the use of higher density material, it is necessary to determine if an increase in density causes an increased physical distortion. A series of samples for density from 1.45 to 1.84 gm/cc are being tested for graphite damage. The preliminary results based upon an exposure of about 700 MD/CT indicate that an increased density does not necessarily cause an increased distortion.

K Pile Graphites

The physical distortion of TS-GBF graphite has been examined for samples of about 1300 MD/CT exposure. This is the highest exposure obtained to date on the TS-GBF graphite which will be used in the K Piles. The higher exposure points are in general agreement with those which were expected on the basis of certain empirical relations which have been developed to describe graphite behavior. In particular, the behavior of the parallel cut graphite indicated a saturation of expansion in agreement with the prediction from the empirical relations.

CS-GBF graphite of exposure of about 2100 MD/CT in a water cool test facility has been examined for irradiation damage changes. The physical distortion is again in agreement with that predicted by the empirical relations. Specifically, a contraction of about 0.3 per cent was obtained by the parallel samples. No saturation was obtained for the thermal conductivity.

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Discharges from both hot and water cooled test holes indicate that AGHT graphite which will be used in the fabrication of KW Pile filler blocks shows radiation damage characteristics similar to those for CSF graphite. In both cases, however, the thermal conductivity of the AGHT material remained higher than CSF graphite samples of the same exposure.

Thermal Conductivity of Gases

Experimental information has been obtained for the thermal conductivity of helium-carbon dioxide mixtures at 100 C throughout the entire composition range. The results check with previously calculated values to within ten per cent. As far as can be determined, no systematic variation exists between the calculated values and the experimentally determined values.

As reported previously, excellent agreement has been found between the corrected calculated values and the experimentally determined values at 0 C for all binary mixtures of helium, neon, nitrogen, and carbon dioxide. This information in connection with the agreement with calculation found at 100 C for carbon dioxide-helium mixtures indicates that calculation of thermal conductivity by the method of Wasseljew may be entirely suitable. Further work is in progress to test this tentative conclusion.

Stored Energy

The Twin Crucible Calorimeter for the determination of annealing spectra of stored energy has been developed so that the limit of determination has been extended from 800 C to 900 C. It is now possible to obtain annealing spectra to this temperature with the same accuracy as previously possible to the lower one. Work is in progress to extend the limiting temperatures to at least 1000 C.

Total stored energy data have been obtained for samples of disordered carbons which have had total exposure in a Hanford Cold Test Hole of about 500 MD/CT. The carbons included a carbon black and a polymer carbon. X-ray examination of the unirradiated material showed the polymer carbon to be more disordered in terms of smaller crystallites than was the case for the carbon black.

The total stored energy build-up due to irradiation was found to be about ten per cent higher for the polymer carbon than for the carbon black and about 30 per cent higher for the polymer carbon than for normal pile graphite such as CSF material. An important difference also exists between the annealing spectra of the polymer carbon and of CSF graphite. Examination of these spectra show that for the normal pile graphite, the stored energy peak at about 200 C has built up in a fashion consistent with past experience. On the other hand, the polymer carbon showed no build up of a 200 C annealing peak and the carbon black material showed a relatively small 200 C peak. These findings can be of importance not only to a better understanding of radiation damage to graphite, but in the design of new graphites to be used in future piles.

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WATER PLANT DEVELOPMENT

Flow Laboratory Studies

Operation of the five in-pile water quality tests at 105-D Flow Laboratory continued. Examination of slugs exposed for two months to water with caustic pH adjustment showed no appreciable differences in corrosion properties between caustic and lime containing water. Also, weight losses in caustic treated water with 2.0 and 0.2 ppm dichromate were approximately equal. Slightly higher corrosion rates were measured in water without pH adjustment. This observation is in contradiction to all previous data showing decreasing corrosion with decreasing pH. The discrepancy is believed due to excessive film formation occurring during the first month of the test. In-pile tests with all of the above experimental-type waters are continuing and are scheduled for completion in October.

Experimental investigation was begun to determine the feasibility of using unfiltered river water as a pile coolant. Studies are being made of the aluminum corrosion effects of raw water at pH's of 8.0 and 7.5 and at dichromate concentrations of two and five ppm. Temperatures up to 95 C are being investigated at present.

The C-type horizontal rod corrosion test was completed this month. The data are being evaluated and plans are under way to examine one or more rods in C Pile during the September outage. The diatomaceous earth filter was under repair during the month and no experimental runs were made. The K-type model downcomer test continued using the newly-installed larger orifice and minimum approach section vaning.

Scope drawings of the 100-K Flow Laboratory were issued for comments, minor revisions made, and approval obtained from the Design Committee. Work is now progressing on the detailed drawings which are scheduled to be completed by November, 1953.

Water Quality Evaluation Studies

Production test operation of the areas using the alum-activated silica water treatment process continued. Improvements in raw water quality obviated use of activated silica during the month. Minor revisions to the alum process specifications were made; it is expected that the specifications will be issued shortly.

The DR Plant Test to determine chlorine requirements continued. Slight algae growth was noted on the half of the plant not using chlorine. No unusual film effects were noted.

A total of 57 front tube examinations were made, including tubes at D, DR, and F. It appears that all barnacles are in a dormant state; there has been no significant change in about four months. At D Area considerable build-up of corrosion product was observed around the cone screens.

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Assistance was given to Fuel Technology personnel assigned to the slug air-weighing apparatus. The backlog of unweighed slugs was appreciably reduced and information was obtained on corrosion rates in the following qualities of water: alum treated water with and without dichromate, ferric sulfate treated water without dichromate, alum treated water at pH 7.0 and 7.3, lime-free water with dichromate, and caustic pH-adjusted water with 2.0 and 0.2 ppm dichromate. Analysis of the above data is in progress.

Recirculation Studies

The one tube in-pile experiment at 100-H Area operated satisfactorily during the month. The flow of cooling water to the heat exchangers was doubled to prevent the recirculation tube from limiting the pile power level.

The out-of-pile tests were resumed at 100-F Area continuing the recirculation run with 25 ppm total solids. Work has begun on the construction of a small high temperature and pressure recirculation system. The purpose of this facility will be to study slug corrosion and film formation rates in the range of 300 - 350 F. The system pressure will be sufficient to suppress boiling. Results from the cold recirculation test showed that aluminum corrosion rates in deionized water can be appreciably reduced by the addition of dichromate ion.

Further progress has been made in the economic considerations of recirculation. Estimated cost figures have revealed that recirculation would be uneconomical at low tube outlet temperatures. It is believed that future work in recirculation should be directed towards tube outlet temperatures in the vicinity of 200 C.

Water Plant Capacity Studies

Work is continuing on the determination of optimum methods of water plant expansion to provide the higher process flow required for pile power level increases. Replacement of present 190 secondary pumps appears to be a feasible method of increasing water flow and pressure to the piles. The new pumps and motors would be sized to carry 95 per cent or more of the pumping load, thus reducing steam costs appreciably.

A test was made to determine the hydraulic flow limits of the D Filter Plant. A half-plant flow of 37,500 GPM was obtained. It appears that with minor revisions to the flow system, about 40,000 GPM can be pumped through each half of the plant.

An analysis of downcomer flow capacities shows that these components will limit pile cooling water flow at rates considerably below those now anticipated. Methods of removing downcomer flow limitations are under study.

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PILE COOLANT STUDIES

In-Pile Corrosion Studies

The fourth test under Production Test 105-510-E to determine the effects of pile irradiation on corrosion of aluminum was started at H Pile on July 18, 1953. This test is being run at a water temperature of 90 C. The aluminum coupons and spacers used were subjected to various known degrees of cold-work and annealing so that information can also be obtained as to the effects of irradiation on metallurgical properties of aluminum.

Process Tube Examinations

A total of nine process tubes, three from C and six from D were examined during the month. The only evidence of corrosion found from these examinations was a slight pitting and overall attack at a slug junction located between ten and 18 feet in from the rear Van Stone flange. Maximum depth of the general attack was 1.4 mils. A total of seven tubes were transported to the 108-B Cave during the month.

The outside surfaces of two anodized tubes, 3378-F and 1967-F that had been removed from F Pile were examined in the storage basin. The anodized coating appeared to be still intact. No evidence of in-pile corrosion of these tubes were rated.

A viewing tray and a storage tray for use in the basin facilities at D Area were fabricated and installed. The tube labeling device operated satisfactorily in tests made at D and F Piles.

Flow Laboratory Tests

The modifications of the 50-tube mock-up are 75 per cent completed. These modifications include the addition of two pumps to increase the water flow and a heat exchanger to supply heated water to five tubes in the mock-up.

Impingement tests at velocities at 100 feet per second for 42 hours using dichromate-free, alum water gave severe pitting of 2S aluminum with and without an air trap in the water line.

Tests were started to determine corrosion rates of slugs that have been autoclaved for varying periods of time.

Slugs that have a water soluble glue coating over the slug jacket to protect the jacket from being scratched while charging are now being tested in the flow laboratory.

Corrosion and Film Formation Tests

Fabrication and construction of an internally heated corrosion tube assembly is 80 per cent completed. This apparatus will be used to obtain solution potential and corrosion rate data of 2S and 72S aluminum under simulated pile heat transfer conditions.

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The fabrication of an assembly to determine corrosion rates and film formation characteristics at elevated temperatures under simulated pile heat transfer conditions is 90 per cent completed. It will be possible to obtain water temperature up to 150 C with this test apparatus.

A test was started to determine the effect of an electrical flux on the corrosion of 2S aluminum in dichromate-free alum water.

Visual and metallurgical examinations of a gun barrel from C Pile having a dark blue diffraction film eight inches long around the inner most end, were made. Observations revealed nothing that could account for this blue film. A badly pitted front Van Stone flange was found on tube 3282-F. The flange has been submitted for cross sectioning to obtain a measure of pit depths.

Development tests were begun to evaluate a device for rapid corrosion rate measurements based on the electrical resistance of a fine wire.

Process Water Studies

The results of a survey, made in conjunction with Water Plant Development personnel, to determine the feasibility of using raw river water for pile cooling were reported in HW-28467, "Columbia River Water as a Pile Coolant".

Electron micrographs confirmed the difference in size previously found between particles desposited from alum treated water and ferrifloc treated water - particles from alum water being ten to 20 times larger than those from ferrifloc water. Confirmation was also obtained as to differences in size of particles deposited before and after pH adjustment with lime. Prior to lime addition particle sizes ranged from 0.01 - 0.05 μ in diameter; after lime addition the particle sizes ranged from 1 to 3 μ in diameter.

Pile Tests

In view of the success of the recent full power purges held at H Pile under the new purging specification, it was concluded that the tests proposed in HW-28750 and HW-28798 are not necessary at this time.

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.

Signed: R. B. Richards

R. B. Richards
Manager, Pile Technology

RBR:mvt

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SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

JULY, 1953

VISITORS AND TRIPS

D. R. Smith visited here from Los Alamos Scientific Laboratories, Los Alamos, New Mexico, July 21, for W-1 Contract count difference consultation.

J. Urban and J. R. Tinker visited here from DuPont Company, Wilmington, Delaware, July 15 and 17, to discuss 234-5 process recovery and off-site shipping specifications and Savannah River Plant Consultations.

G. R. Tatum and A. W. Travena visited here from Vitro Corporation, New York. New York, July 16, to learn semi-works methods as employed in 321 Building.

SECURITY INFORMATION

W. T. Foote visited here from the Atomic Energy Commission, July 16, for consultation on 321 Building equipment and methods.

E. L. Hudgins visited here from New Brunswick Laboratory of the Atomic Energy Commission, July 9, to discuss Redox process questions in general.

ORGANIZATION AND PERSONNEL

Personnel totals are as follows:

	<u>June</u>	<u>July</u>
Administrative	2	2
Chemical Development	85	89
Plant Processes	54	54
P-10 Process Studies	6	9
Analytical Laboratories	-	45
Total	147	199

Chemical Development: One Technical Graduate - Rotational was transferred in from Fuel Technology, three Technical Graduates - Rotational were transferred in from Employee and Public Relations - Technical Personnel, one Chemical Engineer was transferred from Applied Research, one Chemical Engineer was transferred in from Plant Processes Unit, one Technical Graduate - Rotational was transferred to Radiological Sciences - Bio Physics Control and one Chemist was transferred to Employee and Public Relations - Technical Personnel.

Plant Processes: One Supervisor was transferred in from Analytical Laboratories, and one Chemical Engineer was transferred to the Chemical Development Unit.

P-10 Process Studies: Two Junior Engineers were transferred in from Fuel Technology and one Junior Engineer was transferred in from Pile Technology.

Analytical Laboratories: The Analytical Laboratories Sub-Unit of forty-five people was transferred in from Laboratory and Engineering Facilities.

PUREX DEVELOPMENT

Purex Plant Design Liaison

A decision was made during the month to revise the design of the Purex concentrators to provide for replaceable heat exchange tubes and greater heating surface. The departure of the new design away from that originally scoped was given impetus by continued corrosion failures of heating surfaces in existing operating units, and the desirability of operating these concentrators at lower temperatures for process reasons.

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DECLASSIFIEDChemical Engineering Development

Prototype Pulse Column Tests - After shakedown operational testing of the Purex Prototype Facilities, with uranium-bearing solutions as well as with water-and-solvent systems, and completion of such auxiliary equipment modifications and maintenance items as appeared needed, the process testing of the columns was begun with "cold" uranium. The highlights of the findings of the first run are as follows:

1. A 0.1 per cent uranium loss was obtained with the prototype HA Column at a ten-ton U/day processing rate, employing 150 per cent of the Purex Chemical Flowsheet HW #2 HAX:HAF (solvent-to-feed) flow ratio (i.e., approximately twice the theoretical minimum, or "pinching", value). The pulse column used was a full-scale model of the HA Column specified for the Purex Plant (in Document HW-26492). The 13.5-foot high, 24-inch diameter extraction section was divided into four quadrants by crossed vertical baffles inserted between each pair of adjacent perforated plates. The pulse amplitude used was 0.88 inch and the frequency 60 cycles per minute.
2. An approximately 0.1 per cent uranium loss was obtained in the 27-inch diameter HC Column with a 17.8-foot high plate section with dual-face (Kel-F NW-25 plastic-undercoated stainless-steel) perforated plates with 1/8-inch holes, 23 per cent free area, two-inch plate spacing. This column corresponds to the early design for the Purex Plant HC Column, described in HW-26492, and was superseded by the 34-inch diameter all-plastic perforated-plate design developed later and specified in Document HW-27955. A ten-ton per day uranium rate, with 80 per cent of the Flowsheet HW #2 HCX:HCF (extractant-to-feed) flow ratio was employed in the run. A pulse amplitude of 0.8 inch and a 75 cycles per minute frequency were used.

Large Uranium Concentrator and Steam Stripper - In the initial uranium solution testing of the Purex Prototype Facility uranium evaporator, failure of the concentrator feed pump, along with other contributing circumstances, resulted in an overconcentration of the uranyl nitrate solution to the point of incipient denitration. The overconcentration was accompanied by the evolution of brown nitrogen dioxide fumes from the concentrator. Examination of the evaporator contents after the incident has led to the conclusion that a moderately rapid reaction of nitric acid with organic material may also have occurred. The pressure build-up surmised to have accompanied the nitric acid-organic reaction apparently jarred the ceramic Raschig-ring packing in the stripping tower surmounting the concentrator tubes sufficiently to chip many of them badly. Ceramic dust and chips from the Raschig rings were found mixed with the uranium-bearing concentrator residue in almost the entire concentrator pot and filling more than half of the tubes. These difficulties and the equipment and instrumentation modifications made to overcome them are discussed in the following separate report:

HW-28690, "Overconcentration in Initial Operation of Uranium Evaporator - 321 Building", G. Sege, July 10, 1953.

In the first column testing run, discussed above, the uranium evaporator, a vertical long-tube evaporator with 647 ten-foot-long one-inch o.d. stainless-steel process tubes, operated with an over-all heat-transfer coefficient of

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approximately 400 B.t.u./(hr.)(sq.ft.)(°F.). It is expected, however, that this very favorable heat-transfer coefficient will decrease somewhat as a result of tube scaling in the course of further operation.

The six-foot diameter steam-stripping tower, surmounting the concentrator, packed with an 18-foot height of two-inch unglazed porcelain Raschig rings, was effective in removing dissolved and entrained TBP from the HCP (HC Column aqueous effluent stream). A 0.2 to 0.5 g./l. TBP concentration in the HCP was reduced in steam stripping to less than 0.01 g./l., with uranium-bearing as well as with solvent-saturated water solutions introduced into the stripper as HCP at 35 to 45 gallons per minute.

Vapor-Liquid Deentrainment - Vapor-liquid deentrainment in a five-inch diameter deentrainment column was studied in conjunction with a single-tube vertical long-tube uranium solution (HCP) concentrator. The highlights of the results, obtained with no reflux, are as follows:

1. With an unpacked three-foot high deentrainment section above a four-bubble-cap-plate stripping column surmounting the concentrator the concentrate-to-condensate logarithmic decontamination factor (dF) decreased from 5.1 to 4.7 as the superficial vapor velocity in the deentrainment column increased from 1.7 to 5 feet per second. In comparison, a deentrainment dF of 5.0 is needed for the HCP concentrator to result in a condensate, which, when mixed with the remaining Purex Plant concentrator condensates, will meet the five-microgram/liter plutonium concentration limit for disposal by cribbing.
2. Insertion of three bubble-cap plates into the deentrainment section resulted in an approximately three-fold improvement in deentrainment, i.e., in a dF increase (log value) of approximately 0.4.

Mechanical Development

Pump Development - A fractional-horsepower Chempump, 3/4 horsepower, "canned" motor-type centrifugal pump has been placed in operation as an in-line pump pumping water at 20 gallons per minute against a head of 28 feet. This pump has operated smoothly for 400 hours. Only slight wear of the bearings, journals, and thrust faces were observed when the pump was dismantled for inspection after 144 hours of operation.

A Peerless / LA (P-5-A) deepwell turbine pump with a five-foot drive shaft has operated for 504 hours pumping six M nitric acid at a rate of 45 gallons per minute against a head of 7.5 feet. The shaft of this pump is guided by five pile Graphite bearings (Gulf Cleaves coke gas-baked-finish graphite).

The Johnston 7BS eight-stage, deepwell turbine pump with a 17-foot five-inch shaft has been repaired and equipped with 11 Pyrex No. 7740 glass bearings. The pump has operated smoothly pumping water for 456 hours.

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A hydraulic pulse generator drive manufactured by the Askania Regulator Company has operated 7,100,000 cycles in life test at a frequency of 62 cycles per minute and a stroke length of one inch. With this pulse generator drive the stroke length, frequency, and wave shape can be adjusted remotely while the unit is operating.

Materials Testing

Radiation Stability of Kel-F - Eight steel plates coated with Kel-F NW 25 were exposed to gamma radiation in the 100-F Storage Basin. Duplicate plates were removed from the basin after calculated total exposures of 10^5 , 10^6 , 10^7 , and 10^8 roentgens. The abrasion resistance of the Kel-F coating increased slightly until the total exposure equaled 10^6 to 10^7 R. For total exposures greater than 10^7 R. the abrasion resistance was greatly decreased.

Samples of Kel-F (fluorothene) sheet were exposed to gamma radiation from a Ta^{182} source to determine the stability of this plastic under radiation. No damage was observed on samples of Kel-F which had been exposed to as much as 10^7 R. at gamma radiation intensities up to 10^4 R/hr. Samples which had been exposed to a total of 5×10^7 R. at 3.6×10^5 R/hr. exhibited a decrease in tensile strength (compared to an unexposed sample) of 63 per cent, nearly complete loss of flexibility, and a pink discoloration. There was no major change in wetting characteristics of the Kel-F up to the maximum exposure of 10^8 R.

REDOX DEVELOPMENT

Process Studies

Document HW-28424, "Redox Plant Alternative Flow Schemes", was issued during the month. In this document, several operating methods were considered for possible inclusion in the Redox Plant to permit early attainment of Phase II Processing rates.

Redox Reflux Flowsheet - From the basic batch equilibrium data and the data from the first two "Mini" (miniature mixer-settler) runs performed by the Chemistry Unit, Applied Research Sub-Section, a preliminary Redox 2A-2B Plutonium Cycle Reflux Flowsheet has been developed. This flowsheet, together with plutonium and nitric acid operating diagrams for the 2A and 2B reflux columns, has been submitted to the Hot Semiworks group as the recommended flowsheet for initial test runs (Secret Rough Draft Document HW-28833).

Process Chemistry

Head-End: Controlled Scavenging - The use of a known amount of MnO_2 for scavenging dissolver solution following oxidation would be greatly facilitated by the development of a reproducible procedure for reducing all $KMnO_4$ to MnO_2 with a known quantity of reducing agent which is less than the stoichiometric requirement. If a catalytic reaction can thus be induced which will complete the reduction of $KMnO_4$ to MnO_2 , the quantity of the agent required to reduce the MnO_2 further to Mn^{+2} can then be calculated to dissolve all but the amount of MnO_2 which it is desired to leave as a Zr-Nb scavenging agent. This "controlled" quantity of residual MnO_2 would then be removed in the centrifuge.

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The feasibility of initiating this catalytic effect (essentially re-creating the conditions which were destroyed by the "sacrificial" charge of KMnO_4) has been demonstrated in the laboratory by a series of three runs in which the catalytic destruction of the KMnO_4 remaining at the conclusion of the oxidation, was initiated by $\text{Cr}(\text{NO}_3)_3$, $\text{H}_2\text{C}_2\text{O}_4$, and $\text{Mn}(\text{NO}_3)_2$, respectively.

The optimum conditions for the "controlled dissolving" following this catalytic reduction have not been defined, but this study is currently under way with the objective of developing a recommended flowsheet.

Solvent Extractions: Dual-Scrub IA Flowsheet Development - A series of runs has been completed in the Mini mixer-settlers to study the effect of chemical variables on IA dual-scrub operation. The superiority of the dual-scrub over the single-scrub flowsheet was again apparent from these runs, on the basis of Zr-Nb decontamination in the IA and partitioning in the IB banks. This appears to have been true even when the IAS was prepared from Redox-Plant 2DW, thus simulating waste back-cycle.

Dual-scrub gross gamma dF's (log values referred to IAF) were 3.2 to 3.4 for the IAP stream and 3.7 to 4.0 for the IBP stream. With back-cycles 2DW the IAP gamma dF was 3.3. (No reliable result is available for the IBP gamma dF with back-cycled 2DW.) The corresponding values for the single-scrub run were 2.8 for IAP and 3.6 for IBP.

URANIUM RECOVERY DEVELOPMENT

Process Studies

The copper ferrocyanide scavenging treatment of TBP-process waste solutions (recently developed by the Chemistry Unit, Applied Research Sub-Section) has been examined to determine its applicability for plant testing. If the cesium and strontium decontamination factors demonstrated in the laboratory (approximately 400 or more) are approached in the plant, and the residual fission products in the scavenged supernatant adsorb satisfactorily on the soil, it appears feasible to dispose of large volumes of neutralized RAW salt waste from the TBP process to cribs. Two methods of incorporating the copper ferrocyanide treatment in the plant have been described in Document HW-28715.

Process Chemistry

Solvent Extractions: Kinetics of Uranium Transfer - The rate of uranium transfer under simulated RA Column conditions has been studied under a variety of conditions. Tentative conclusions which may be drawn from this preliminary work include:

1. At high uranium concentrations (60 g./l.) in the initial aqueous phase, doubling the TBP HW No. 4 Flowsheet PO_4^{3-} concentration decreased the rate of uranium transfer by about 20 per cent, whereas an increase in SO_4^{2-} concentration was essentially without effect. Under dilute RA Column conditions ($\text{U} \approx 5$ g./l.) neither SO_4^{2-} nor PO_4^{3-} had an appreciable effect upon the rate of uranium transfer.

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2. Plant samples of ROO (washed solvent) have generally given poorer results than those obtained with laboratory-prepared solvent.
3. At high uranium concentrations, increasing the temperature from 25 to 35 C increased the rate of uranium transfer by only about ten per cent, but an increase of 35 to 40 per cent was noted when the temperature was increased to 50 C. Under dilute RA Column conditions the effect of temperature was less pronounced, a rate increase of ten to 20 per cent being observed when the temperature was increased from 25 to 50 C.

Oxalate Flowsheet - Mini mixer-settler runs employing 0.1 M $\text{H}_2\text{C}_2\text{O}_4$ as RAS and 4 M HNO_3 as RAIS, have shown that the formation of precipitates will occur in the scrub section under these conditions. The use of 0.05 M $\text{H}_2\text{C}_2\text{O}_4$ in the RAS or 0.1 M in the RAIS has shown no indication of precipitate formation. Constant plutonium decontamination factors of about 50 were obtained in these runs, indicating the Pu D.F. to be independent of the oxalate concentration in the scrub within the range studied (0.05 to 0.1 M).

RA Pulse-Column Studies - Three RA Column runs have been made in a one-half-inch diameter pulse column using 5.5-year aged metal waste in a comparison of single-scrub and dual-scrub operation. Scrub compositions were as follows:

Single-scrub:

1. RAS = 0.05 M Fe^{++} + 2 M HNO_3

Dual-scrub:

1. RAS = H_2O , RAIS = 4 M HNO_3 + 0.1 M Fe^{++}
2. RAS = 0.1 M $\text{H}_2\text{C}_2\text{O}_4$, RAIS = 4 M HNO_3

No significant differences in fission-product decontamination were found. However, both dual-scrub runs increased Pu D.F. by a factor of two and decreased the RAU nitric acid concentration by a factor of about 15. No precipitate was formed in the dual-scrub run employing 0.1 M $\text{H}_2\text{C}_2\text{O}_4$ in the RAS, but an additional run made using 0.15 M $\text{H}_2\text{C}_2\text{O}_4$ resulted in the formation of solids.

Uranium Concentrator: Corrosion Inhibitors - The study of corrosion inhibitors for the six to 60 per cent UNH concentration step in the Uranium Recovery Plant, was initiated in the laboratory in a two-liter, Type 347 stainless-steel pot concentrator. The heat was supplied by means of steam to a coil of one-fourth-inch 347 stainless-steel tubing with a surface heating area of approximately 0.5 square foot.

Corrosion in the laboratory unit has been achieved only by total reflux of 60 per cent UNH containing 100 g./l. HNO_3 , the iron content of the RCU increasing in a period of four hours from 20 to 200 p.p.m. (U basis) under these conditions. Several corrosion inhibitors have been tried to date with two, isophorone and formaldehyde, decreasing corrosion essentially to zero, when present in concentrations of 0.012 and 0.014 weight per cent, respectively. Neither of these inhibitors caused foaming during subsequent calcination of UNH to UO_3 , and neither had an adverse effect on the reactivity of the UO_3 produced.

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Continuous Calcination

Pilot Plant - Extensive modifications of the fluid calciner were initiated and are virtually complete. These include rebuilding the turbine dust separator to provide a labyrinth seal, an air-cooled, insulated shaft and oil circulation to the bearings. An external feed system designed from laboratory experiments will be installed.

A pilot-plant screw calciner was installed and one run was made. Several mechanical difficulties were encountered in the operation of the belt feeder and the screw. It was necessary to install additional heaters on the top of the trough to insure even heating to prevent distortion.

Mechanical Development

Concentrator Corrosion - The following informal report was issued:

HW-28492, "Semiworks Studies for the Reduction of Corrosion-Product Impurities in the U.R. Plant UO_3 ," L. C. Amos, B. E. Kirkandall, and K. L. Adler, July 2, 1953.

321 BUILDING OPERATION

Operation of the 321 Building pilot-plant equipment continued on a three-shift per day, five-day week (Monday through Friday) basis. The initial operation of the Purex prototype equipment took place during the month. The results of the pilot-plant studies are presented elsewhere in this report.

HOT SEMIWORKS

Maintenance work scheduled during the recent shutdown period is now complete and the first solvent extraction cycle for Run HR-9 is expected to start in the near future.

The design of process equipment for conversion of the Hot Semiworks to study the Purex process was continued during the month.

URANIUM RECOVERY PROCESS TECHNOLOGYSummary

Four tank farms supplied feed containing uranium aged from four to 7.5 years to the solvent extraction batteries which were operated under nominal TBP HW #4 Flowsheet conditions using 20 volume per cent TBP in petroleum hydrocarbon diluent at 97 per cent of design rate. Product (ROU) from the TBP process was shipped to the UO_3 conversion plant for concentration and calcination along with UNH from the Redox process. The over-all uranium recovery operation sustained a waste loss of 4.6 per cent of new feed uranium. Shipments of UO_3 averaged 23 per cent and 140 per cent (some U^{237} gamma activity was included in the UO_3 , and corrected values available for only 27 per cent of the UO_3 shipped bring the over-all average to 140 per cent from 170 per cent) of aged natural uranium beta and gamma (fission product activity basis) with less than five parts plutonium per billion parts of uranium. Metallic impurities averaged 210 parts per million parts of uranium.

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Metal Removal

Approximately 4000 gallons of stored alkaline waste were removed by supernate sluicing, water sluicing and direct transfer of supernate for each ton of uranium recovered from underground storage. Water sluicing increased the volume of the dilute feed by approximately 1840 gallons per ton of uranium. Early in the month solvent extraction performance dictated the requirement for a lower phosphate to uranium ratio to permit attainment of lower uranium losses and, consequently, water sluicing was initiated in 101-T despite the satisfactory removal rates experienced with supernate sluicing.

Major production curtailments were experienced through failure of three slurry pumps, six sluice nozzles, lack of a sluicing pump at C Farm and some difficulty with pluggage in the B Farm sluicing and blending systems. The pluggage difficulties at BXR appear to be due to some unidentified but reportedly "paper-like" material observed in the 101-BX Tank. Sluice nozzle difficulty was due to hose ruptures and resulted in time lost for replacement. Two of the nozzles used as replacements in the 101-BX Tank are modified to bring the nozzle four feet closer to the sludge.

Sluicing of a test batch of 101-BX feed was started on July 8. Difficulties experienced with pluggage and transfer, in addition to waste loss and decontamination problems in the TBP Plant have resulted in deferment of the processing of this feed until early in August. Preliminary data indicate that the 101-BX feed is higher than flowsheet in phosphate to uranium ratio and is approximately 2.5-fold higher in fission product activity.

A preliminary test of television viewing in an empty (101-TY) tank gave inconclusive results. Shop testing of the equipment was satisfactory and it is probable that the illumination level in the tank was too low for television whereas a periscope installed in the same tank gave reasonably good definition. Television testing was carried out with the assistance of Pile Technology, and Instrument personnel.

Feed Preparation

Acidification of the above feeds required about 12,400 pounds of 100 per cent HNO_3 per ton of uranium in routine blending operations. An average boil-off of 4.1 volume per cent in 221-U concentrators with subsequent centrifugation of about one-half of the concentrated feed to remove gross amounts of solids gave feed of the following average composition to the solvent extraction batteries:

	<u>Components M (a)</u>					
	<u>U</u>	<u>SO₄</u>	<u>PO₄</u>	<u>HNO₃ (b)</u>	<u>Na</u>	<u>K^{1/2} (c)</u>
Feed	0.221	0.209	0.266	2.6	3.72	4.6 to 7.4
HW #4	0.27	0.26	0.26	2.6	4.06	5.5

(a) Balance of anion is NO_3^-

(b) Titratable, includes 2H^+ from SO_4 , 2H^+ from PO_4 .

(c) Not an average. Range is shown to indicate variation.

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Waste Handling

Approximately 4300 gallons of concentrated neutralized waste per ton of new uranium processed was returned to permanent underground storage to give 107 per cent of the volume removed. Waste pH was routinely controlled at eight to nine. Waste concentration to a specific gravity of 1.36 (at 80 C) with an average clear point of 23 C was modified to give an approximately ten per cent greater volume reduction at a specific gravity of 1.40 (at 80 C) after July 20, when it was observed that only a 20 C temperature gradient is experienced between the WR-001 pumpout tank (nominally at 70 C) and the nearby West Area (TY) Waste Storage Tanks. Clear points have averaged 27 C with a maximum of 35 C under these new conditions. The above salt waste contained approximately 4.3 per cent of the new feed uranium.

About 18,600 gallons of low-activity waste containing 0.3 per cent of the new feed uranium were sent to cribs for each ton of new uranium processed. The ROW and miscellaneous wastes contained about one-half of the total uranium in cribbed wastes and thus the entrainment loss from concentrators was only 0.15 per cent as compared with 1.5 per cent from this source reported in June.

It is planned to carry out a plant test of copper (or nickel) ferrocyanide scavenging on about one waste tank volume (500,000 gallons) of unconcentrated salt waste at an early date.

Flowsheet Conditions

The uranium processed by the solvent extraction batteries was 97 per cent of the nominal design input. Of this amount, 2.8 per cent was rework uranium. Nominal HW #4 TBP Flowsheet conditions were employed except that the organic phase was a nominal 20 volume per cent TBP in hydrocarbon diluent, and, in the main, dual-scrub RA Columns were employed to minimize nitric acid in the RCU. (At month end, the "B" line RA Column was changed to a single-scrub to assure good control during the imminent "BX" test.) On July 21, the ROS composition was changed from 5.0 weight per cent sodium sulfate to 2.5 weight per cent sodium oxalate in an attempt to improve solvent quality.

Solvent Quality

Column performance throughout the month was generally poor. Recent laboratory data and plant experience suggest that the chief cause of the difficulty was poor quality RAX which decreased the rate of uranium transfer and built up considerable fission product activity. An ROO sample from "B" line showed a considerable decrease in uranium transfer rate over that observed for virgin RAX. The RO Columns operated using 5.0 weight per cent sodium sulfate as ROS until July 21, removing the uranium from the organic stream almost quantitatively. At that time operation was begun using 2.5 weight per cent sodium oxalate as ROS. Preliminary data indicate considerably less efficient uranium removal and little or no fission product decontamination. The effect on uranium transfer rates, and thus waste losses, is still being evaluated and the over-all effect of sodium oxalate washing will be further evaluated in August. Improved performance with either virgin solvent or freshly carbonate washed solvent was observed.

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Waste Losses

RA Column losses throughout the report period were generally high, averaging 3.1 and 4.8 per cent of the feed uranium on "A" and "B" Lines, respectively, probably because of the organic phase deterioration described above. The feed composition was fairly uniform and values of $K^{1/2}(\text{NO}_3)$ were generally 4.5 to 5.0. Occasional discrepancies in phosphate and nitric acid analyses on the dilute feed and the RAW appeared and certain feed batches were thus processed under less than optimum conditions.

Operation of the RA Columns during the first half of the month was controlled with a RAX rate to give about 50 per cent of "pinching L/V". The increased RAX rate (up to 170 per cent of flowsheet), appeared to give no significant waste loss improvement and, therefore, was abandoned on July 17.

RA Column flushes had no significant effect on the RAW loss of either line. The use of new, carbonate-washed RAX reduced "A" Line losses by a factor of two to four. On the otherhand, after one use, the fresh RAX appeared to lose its beneficial effect.

RC Column losses were generally less than 0.5 per cent of the feed uranium and occasionally as low as 0.1 per cent. The dilute end RC Column uranium distribution ratio (E^0/a) did not vary significantly from 0.015 since RAX changes were made on approximately a biweekly basis. The use of new freshly-prepared RAX appeared to produce a small but significant decrease in the RCW loss.

Decontamination

Both lines gave almost identical decontamination performance. Logarithmic decontamination factors for beta and gamma activity and plutonium averaged 3.4, 4.1, and 2.2, respectively.

URANIUM PRODUCT PROCESSING

Summary

During the month, calcination operations produced UO_3 containing 125 per cent of uranium processing design capacity. This total production was composed of a blend of 58 per cent TBP and 42 per cent Redox-source uranium.

Total metallic impurities in carload UO_3 composites ranged from 86 to 310 parts per million parts of uranium with an average of 188 parts per million parts of uranium. Average total metallic impurities in UO_3 produced during the month of May, 1953, was 432 parts per million parts of uranium. (The use of low-acid RCU feed for the primary concentrators was initiated early in June.) Plutonium and beta specifications were not exceeded; however, 67 per cent of the product contained fission-product gamma activity in excess of 100 per cent of the gamma activity of aged natural uranium.

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UNH Processing

Approximately 2.8 pounds of uranium per ton of uranium processed were lost to the RCU Steam Stripper condensate. This represents a 32.2 pounds per ton decrease over the June entrainment loss and a savings for the month of \$71 000, which can be attributed to the installation of the inverted cyclone (\$2500 total cost).

Moderate foaming in the pots over a three-day period was demonstrated to be caused by a low steam to feed ratio in the steam stripper.

A substantial reduction in corrosion-product impurities in primary concentrator liquor is evidenced by the reduced iron content of product UO_3 . Carload composite iron averages for the months of May, June, and July were 244, 135, and 85 parts iron per million parts of uranium, respectively. This improvement in product purity can be attributed to high evaporator throughput rates and to the use of low-acid RCU starting June 10. It has been recommended that during low production rates, E-D-1 be operated alone and E-B-1 be shut down, utilizing auxiliary steam for the stripper, in order that the nitric acid in the 60 per cent UNH product of the primary concentrators may be kept at a minimum.

The 100 per cent UNH concentrator was again flushed with 5.0 weight per cent HF to remove scale. The over-all apparent heat transfer coefficient was increased from 80 to 180 BTU/(hr.) (sq.ft.) (°F). The latter was maintained for several days but dropped rapidly to 140 BTU/(hr.) (sq.ft.) (°F) upon increasing the specific gravity of the UNH concentrate from 2.5 to 2.58.

 UO_3 Conversion

On a midnight to midnight basis, the production record of 17.2 tons of uranium as UO_3 was matched, under normal processing conditions.

Air-leakage tests, involving sealing the pot lids, appeared to indicate that reduction of air leakage to less than 200 cfm is impractical with present equipment.

An incremental loading test conducted during thirty calcinations showed only a five to ten per cent increase in average heating time cycles. Recharge increments varied up to 25 per cent of the nominal design charge, giving an over-all increase in average processing rate of from 72 to 80 pounds of uranium per pot per hour. Pot-agitator power requirements were not excessive during the mastic stage.

High Chloride in the Nitric Acid Absorber

Excessive chloride accumulation in the nitric acid absorber required frequent purges and may be attributed to the following:

1. Increased chloride in the RCU resulting from the low-acid flowsheet.
2. Increased chloride in Redox 60 per cent UNH.
3. Decreased chloride distribution ratio (chloride in vapor to chloride in liquid) in the concentrators as a result of lower nitric acid concentrations.

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DECLASSIFIEDB AND T PLANT OPERATIONS - WASTE EVAPORATION

The waste evaporator at B Plant completed the reconcentration of first-cycle waste on July 9. During the report period, 240,625 gallons of feed were processed to yield 103,125 gallons of concentrate and 145,489 gallons of condensate for a waste volume reduction of 57.1 per cent.

A hydrostatic test disclosed a leak in one of the heating coils of the waste evaporator at B Plant; consequently, all of the coils will be replaced and the evaporator will receive a general overhaul before starting on the concentration of TBP-Plant waste.

The waste evaporator at T Plant began concentrating TBP-Plant waste from Tank 109-T on July 5. The evaporator processed 255,750 gallons of feed into 140,250 gallons of concentrate and 109,679 gallons of condensate for a waste volume reduction of 45.2 per cent. Initially, the TBP-Plant waste was processed to yield a calculated 30 per cent reduction of waste volume. Concentration was gradually increased until, at the end of the month, waste volume reduction of 50 per cent was being obtained with satisfactory evaporator performance.

REDOX PROCESS TECHNOLOGYSummary

For the majority of the month, the Redox Plant was operated with three uranium cycles and three plutonium cycles. By-passing of the Second Uranium Cycle was not possible since the necessary MnO_2 scavenging of Zr-Nb from IAF could not be accomplished because of the H-2 Centrifuge plow failure; however, the $KMnO_4$ Heat-End oxidation procedure was used and revised to permit better process control in the future. Operation at an instantaneous production rate of six tons of uranium per day was sustained for extended periods during the month. Modifications to the Uranium Cycle flowsheets to permit operation at an instantaneous production rate of seven to 7.5 tons of uranium per day were being tested at month end. In addition, capacity tests of the Second and Third Plutonium Cycles (operating under current flowsheet conditions) indicated satisfactory performance of these columns at an instantaneous rate of ten tons of uranium per day.

Process Performance

The following table summarizes decontamination performance data by solvent extraction cycle for the period indicated. Because samples of individual column aqueous waste streams cannot be obtained regularly, over-all waste losses only are given:

Period covering July 10, 1953, to July 17, 1953; nominal production rate of 6.0 tons uranium per day, processing 78-day "cooled" metal with $KMnO_4$ volatilization of Ru and complete dissolution of MnO_2 (no scavenging of Zr-Nb).

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<u>Cycle</u>	<u>Gamma Decontamination Factors (dF)</u>		<u>Per Cent to Waste</u>	
	<u>U</u>	<u>Pu</u>	<u>U</u>	<u>Pu</u>
Feed Prep.	0.03	0.03	0.006	0.04
1st	3.5	3.9	—	—
2nd U	3.1	—	—	0.07
3rd U	0.4	—	—	—
2nd Pu	—	2.3	—	—
3rd Pu	—	1.2	—	—
Overall	7.0	7.4	1.00	1.03

While these data are representative of performance for the majority of the month, several unexplained shifts in the decontamination performance achieved across both the First and Second Uranium Cycles were observed. Whereas part of these shifts occurred during major flowsheet changes, it was not anticipated that the changes would affect decontamination appreciably. Further study is required to obtain an understanding of this performance.

Feed Preparation

The dissolvers were charged during the month with uranium having an average pile exposure of 563 (498 to 599) MWD/T. Since the installation of rotameters in the acid addition lines to A-2 and C-2 dissolvers, the method of incremental and continuous acid addition has been used as follows:

initial charges	500 lb. H ₂ O
	5000 lb. 60 per cent HNO ₃
continuous addition at	
rate of 30 lb./min. after	
solution specific gravity	
reaches 1.55 (hot)	5500 lb. 60 per cent HNO ₃
	10500 lb. 60 per cent HNO ₃
	per 4.95 tons U

Beneficial results of this new procedure include:

- (1) reduced over-all dissolver time cycles from approximately 36 to 30 hours per charge,
- (2) greater than ten per cent reduction in HNO₃ requirement per charge,
- (3) more easily controlled operation and more freeboard in dissolver, and
- (4) development of technique for future down-draft HNO₃ Recovery Tower operation.

To date no deleterious results have been observed as a result of this new procedure.

Silver Reactors A-3 and B-3 required regeneration because of I¹³¹ break-through after having served through dissolution of 135 and 165 tons of uranium, respectively, since previous regeneration. A second treatment was required for B-3 because of a poor distribution of the silver nitrate solution spray during the initial treatment.

The average age of 48 IAF batches prepared was 81 (73 to 100) days. All batches were oxidized by the KMnO_4 Head-End oxidation procedure, but no scavenging of zirconium-niobium with MnO_2 was accomplished because of the failure of the H-2 Centrifuge plows (necessary for MnO_2 cake removal). During the month plant testing of the Head-End procedure has been directed toward determination of the minimum potassium permanganate requirements. The data obtained are summarized below:

Number of HE Runs	KMnO ₄ Molarity		Approx. Ru D.F.
	Sacrifice	Oxidation	
51	0.02	0.05	10 to 20
4	0.02	0.03	10 to 16
25	0.01	0.03	5 to 9
13	0.01	0.02	7 to 13
1	0.01	0.01	5.2 (one analysis)
3	0.008	0.01	5.6 (one analysis)

These data indicate reduced ruthenium decontamination factors with the low permanganate concentrations. The reproducibility of the low permanganate concentration runs must be determined. The utilization of these low permanganate concentrations is desirable from two standpoints:

- (1) reduced cost of chemicals (KMnO_4 and $\text{Cr}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$), and
- (2) uniformity of zirconium-niobium scavenging on MnO_2 .

A satisfactory balance between the ruthenium decontamination factor and control of zirconium-niobium scavenging must be obtained by additional testing.

Uranium Extraction and Decontamination

In general, nominal conditions of the ORNL June, 1949, (acid-deficient) Flowsheet (HW-22834) were employed for the First Extraction Cycle and the Second Uranium Cycle.

On July 24, the 2DF and 3DF concentrations were increased from 2.0 M (60 weight per cent) UNH to 2.45 M (69 weight per cent) UNH in order to achieve increased column capacities and economics of reduced aluminum nitrate and waste storage consumption. The capacities of the 2D and 3D Columns are estimated to be in excess of seven tons of uranium per day when operating under the following flowsheets:

2DF:2DS:2DX:2EX = 81.7:75:300:120

- (1) with 2DS composition of 2.0 M $\text{Al}(\text{NO}_3)_3$, 0.2 M HNO_3 -deficient, no Fe^{+2} ,
- (2) with 2DF composition of 2.45 M UNH, 0.2 M HNO_3 -deficient, and
- (3) water for 2EX.

3DF:3DS:3DA:3DX:3EX = 81.7:69:30:350:120

- (1) with 3DS composition of 2.5 M $\text{Al}(\text{NO}_3)_3$, 0.2 M HNO_3 -deficient, no Fe^{+2} ,
- (2) with 3DF composition of 2.45 M UNH, no caustic addition, and
- (3) water for 3DA and 3EX.

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No effect has been noted as a result of the elimination of the NaOH butt to the 3DF. Operation of the plant at an instantaneous rate of seven tons of uranium per day was sustained for four days at the end of the month. The Second Uranium Cycle decontamination factor decreased simultaneously with this flowsheet change, but no conclusions can be drawn at the present time regarding the relationship of these events.

Plutonium Extraction and Decontamination

Reductions in 2AS and 3AS flows to 67 and 100 per cent of 2AF and 3AF flows, respectively, have been accomplished without indication of overflow difficulty or loss of decontamination. Additional decreases in scrub flows are planned. Four conditions have been changed during recent months which have permitted these reductions:

- (1) the interfaces have been lowered to reduce the amount of essentially stagnant aqueous solution (which could accumulate an emulsifier) between the interface and the scrub inlet;
- (2) filtration of all aluminum nitrate used in the plant was started in June;
- (3) the IA and IS Columns have been under better control due to improved flow control and scavenging of IAF; and
- (4) the scrubs have been used at a slightly elevated temperature, 35 C.

On July 29, the Plutonium Cycles (using the current flowsheet) were operated at a ten tons of uranium per day rate, and satisfactory operation was indicated.

Z AREA - ISOLATION, PURIFICATION, AND FABRICATION PROCESS TECHNOLOGY

Plutonium IV Oxalate Precipitation

System cleanouts are required at six to ten run intervals to assure batch size control. The data obtained from analyzing samples of the cleanout solution taken in each tank indicate that ca. 65 per cent of the plutonium recovered is held in the precipitator tanks.

Creamy, slow-filtering plutonium (IV) oxalate slurries were occasionally encountered during the month. On the basis of recommendations by the development laboratory the condition was generally improved by continuing the 50 C digestion for an additional 30 minutes.

Filter Boat Repair

All filter boat leaks are being repaired by the gold soldering method. The boats are treated in hot $\text{Al}(\text{NO}_3)_3\text{-HNO}_3$ solution prior to soldering to remove PuF_4 from the filter discs and between the platinum liner and Hastelloy body. A total of 67 grams of plutonium have been removed from four boats. Since the filter area of several of the discs has been severely reduced by soldering, they are to be replaced when replacement discs are available.

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DECLASSIFIEDDouble Sample Can Loading

Double loading of sample cans did not start during this period as anticipated. A test is being designed to determine the nuclear safety limitations for the double loaded sample cans. This test is now scheduled for mid October and will be conducted by personnel of the Experimental Physics Unit, Applied Research Sub-Section.

Task II

Based on fluoride color, 23.4 per cent of the runs required refluorination. This is comparable to 21.4 and 21.8 per cent in June and May. There were no retort failures during this report period. Of 19 cyclinders of anhydrous HF tested nine had pressure greater than ten psi above the vapor pressure of anhydrous HF at the observed temperature. This with analytical data from samples obtained from four cyclinders indicates that an appreciable amount of free hydrogen is present in the anhydrous HF currently in use. All cyclinders will be purged before installation on the anhydrous HF supply lines.

Emphasis in Task II for this and future months are toward reduction of both the time cycle and refluorination incidence. The regular drying-oxidation cycle is as follows: raise furnace baffle temperature to 190 C in 20 minutes, hold at 190 C for 15 minutes, raise temperature to 300 C in 25 minutes, hold at 300 C for 60 minutes then begin fluorination cycle.

Four runs made last month with a recording thermocouple embedded in the cake revealed that the cake temperature at the end of the normal drying and oxidation cycle was not high enough for complete conversion of the oxalate to oxide. Therefore, three test runs using embedded thermocouple were made this month with higher baffle temperatures. The furnace baffle temperature was raised to 400 C as rapidly as possible and held until the cake temperature rose above 100 C indicating that drying was complete. The furnace baffle temperature was then allowed to fall to 300 C and held until the cake temperature reached 250 C (at this temperature the oxalate is considered to be decomposed). Fluorination was started and the normal fluorination cycle of 30 minutes at 300 C and one hour at 600 C was followed. Based on the data obtained from these test runs a modification of this test cycle is being used for ten runs with a time saving of approximately 30 minutes over the normal cycle. This test cycle is as follows: heat as rapidly as possible to 400 C, reduce control temperature to 300 C and allow residual heat in the winding to maintain the baffle temperature at 400 C for approximately 15 minutes and then fall to 300 C. Hydrofluorination is started after 90 minutes from the start of the heating cycle. Fluorination proceeds according to the regular cycle. Six of the ten runs had been made at month end and all were satisfactory.

Task III (Reduction)

The average reduction yield for this report period was 96.2 per cent as compared with 95.8 per cent and 94.1 per cent for June and May, respectively. No reductions using 70-58 oxide were made. A supply of this chemical is being accumulated for use in Production Test 235-10, "Evaluation of Large Batch Reduction of Plutonium Tetrafluoride".

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Task IV (Casting)

Task VII (Coating) - Process Performance

Final Inspection and Quality Control

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Crucible Shop Activities

234-5 PROCESS DEVELOPMENT

Solution Chemistry: 224-T, 231: Tolerance for Aluminum in 224-T, Master Recycle Runs

Four laboratory experiments, using the 224-T Building flowsheet for master recycle runs, have confirmed previous results, which showed that the addition of as much as 1000 grams of aluminum per plant run causes no significant increase in plutonium losses through the lanthanum fluoride precipitation cycles. Since F-10-P solutions often contain enough fluoride ion to interfere with the precipitation of plutonium peroxide by increasing its solubility, and since it has been shown that aluminum ion is effective in counteracting the effect of fluoride ion, it has been recommended that up to four grams per liter of aluminum, as aluminum nitrate, be added to each F-10-P run before it is processed in the 231 Building.

Task II (Dry Chemistry): Reactivity of Plutonium Oxide

Measurements of the rate of dissolution of four samples of PuO_2 in boiling 5 M HCl -0.1 M KI, used as a measure of PuO_2 "reactivity", have given evidence that:

- (a) the dissolution rate is first order with respect to the PuO_2 , the reaction rates for two of the samples indicating two "species" of oxide in each; and
- (b) the dissolution rate is markedly affected by the maximum temperature reached by the powder bed during the Pu(IV) oxalate - PuO_2 conversion by calcination. Measured rate constants varied from 0.003 min^{-1} for 620° oxide, to 0.17 min^{-1} for the more reactive component of 300° oxide. Comparable variations in fluorination rates have also been observed.

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Task III (Metal Reduction): Reduction of "Blue" Fluorides

A plant batch of "blue" fluoride (RMX-13-7-39) which ordinarily would have been refluorinated prior to reduction in Task III, was reduced in the laboratory reduction hood. The excellent button and 97 per cent yield (calculated from the reported fluorine content of 21.7 per cent, corresponding to an empirical formula of $\text{PuF}_{3.5}$) show the feasibility of routinely reducing "blue" fluorides in the plant, thus eliminating the need for their refluorination. These results also suggest the possibility of routinely preparing PuF_3 instead of PuF_4 in Task II by fluorination with HF only. This process would have the advantage that the process gas, containing no oxygen, should be less corrosive.

Task VII: Experimental Coating

234-5 PROCESS RECOVERY - RECUPLEX

The removal of the contaminated supernatant-recovery facilities from the 234-5 Building has been completed. Construction of the eight-inch concrete radiation barrier adjacent to the Reception-and-Blending hood has commenced.

P-10 PROCESS STUDIES

Extraction plant design and construction liaison and extraction operations materials procurement liaison continued. Since no formal personnel training programs were conducted during the month, Sub-Unit personnel were concerned with the preparation of standard operating procedures, process specifications, operating standards, and with physical reactivation of the metal line extraction equipment.

Vacuum tank (product shipping container) procurement has not been resolved. The customer has recommended (telegram received July 15, 1953) that "all future shipments of P-10 be made in tanks equipped with the old type needle valve". Vacuum tank fabrication drawings and specifications were revised to comply with that recommendation and by month end had been transmitted to the customer for his review and approval. Since an inventory of needle valved tanks does not exist at Hanford, product shipping schedules may be delayed by that recommendation.

ANALYTICAL LABORATORIES

The Analytical Laboratory in support of Chemical Development and Chemical Research continued the analyses of samples for Process Improvement, Process Chemistry, Process Scouting, Chemical Engineering Development, Metallurgy and Pile Physics. Much of the analytical work aided in the evaluation of Purex HCP evaporator deentrainment runs. Fission product analyses, to obtain a complete fission product profile of current metal waste feed, accounted for a large per cent of the total work load.

The Spectrochemical Laboratory continued to support the 300 Area Metal Preparation process and to assist a number of programs and groups through qualitative and quantitative analyses of miscellaneous samples. An improved method for typing stainless steel has been developed. The new method is a densimetric determination for chromium, nickel, silicon, manganese, columbium, molybdenum, and possibly titanium by means of a condensed spark. All seven of these elements can be determined by one sparking. The range of concentrations of the elements is as follows:

chromium	12.0 - 25.0 %	silicon	0.3 - 2.0 %
nickel	6.0 - 30.0 %	molybdenum	1.5 - 4.0 %
manganese	0.5 - 3.0 %	columbium	0.3 - 1.0 %

At present titanium is reported on a qualitative basis.

The Special Analytical Laboratory performed analyses in connection with a number of plant problems and investigations. A complete profile was made of the end product of the overcentration of uranyl nitrate occurring in the initial operation of the 321 Building Purex prototype concentrator. A nephelometric method for the determination low level chloride in uranium is being investigated. A Flamephotometric method was successfully used for determining magnesium in a uranium alloy.

The Mass Spectrometer Laboratory is continuing to prepare the C-N Spectrometer for the coming P-10 program. A variety of gas samples have been analyzed by the General Electric Spectrometer. Pile gases from all piles are of major interest. Examples of other gases examined are: off-gases from fused salts, off-gas from irradiated UNH and hexone and off-gas from HF storage tanks, etc. Adding Butene-1 each night to the filament of the General Electric Spectrometer has proven to be a sound practice. This results in more stable filament current.

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Separations Technology Sub-Section

HW-28906

Work volume statistics for the Analytical Laboratories are as follows:

	<u>June</u>		<u>July</u>	
	<u>Number of</u> <u>Samples</u>	<u>Number of</u> <u>Det'ns.</u>	<u>Number of</u> <u>Samples</u>	<u>Number of</u> <u>Det'ns.</u>
<u>Research and Development</u>				
Applied Research Unit	2122	3585	1511	3926
Pile Technology Unit	470*	3265*	277	663
Fuel Technology Unit			85	1619
Separations Technology	626	1458	314	649
<u>Process Control</u>	470	2339	550	2240
<u>Others</u>	<u>180</u>	<u>1236</u>	<u>107</u>	<u>1134</u>
Total	3868	11883	2844	10231

<u>Standards and Calibrations</u>	<u>June</u>	<u>July</u>
Number of standard solutions prepared	18	18
Stock solutions dispensed	58	62
Number of calibrations performed	120	879
Number of calibrated glassware dispensed	63	57
Number of checked glassware dispensed	<u>83</u>	<u>60</u>
Total	342	1076

*Includes Fuel Technology

INVENTIONS

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

Inventor

W. S. Figg

Title

Pulsed Mixer-Settler Solvent
Extraction Contactors.

V. R. Cooper

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

VRC:mvt

August 7, 1953

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August 10, 1953

APPLIED RESEARCH SUB-SECTION

July, 1953

VISITORS AND BUSINESS TRIPS

H. G. Hicks, California Research and Development Corporation, Livermore, visited Hanford July 1 in consultation on radiochemical techniques.

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Applied Research Sub-Section

T. K. Bierlein spent July 1 at Radio Corporation of America, Camden, New Jersey, discussing single crystal studies, electron microscopy and diffraction and use of NaK.

W. E. Roake spent July 1-2 at Knolls Atomic Power Laboratory, Schenectady, discussing radiometallurgy equipment design and separations problems.

A. S. Wilson attended the Gordon Research Conference in New Hampton, New Hampshire, on July 6-9; July 13-14 was spent at Argonne National Laboratory, Lemont, Illinois, discussing ruthenium chemistry work; July 15-16 was spent at Knolls Atomic Power Laboratory discussing fission product chemistry.

J. O. Erkman visited Argonne National Laboratory on July 20 to obtain information on plastic scintillators.

M. J. Sanderson spent July 20-24 at the du Pont Company, Wilmington, Delaware, discussing metal quality.

ORGANIZATION AND PERSONNEL

Personnel totals as of July 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	27	2	2	9	40
Metallurgy Unit	42	3	2	25	72
Chemistry Unit	50	1	2	16	69
Administration	<u>2</u>	<u>=</u>	<u>=</u>	<u>5</u>	<u>7</u>
TOTAL	121	6	6	55	188

Four summer program employees not included in totals.

PHYSICS

Lattice Physics

An attempt was made this month to raise the neutron flux level in the exponential pile by the insertion of about 250 C-2 slugs in the two bottom layers of this pile. It had been hoped to obtain an increase in the flux by a factor of ten, however an increase by a factor of only 3.5 was obtained in the experiment. The amount of U-235 used was about 5 kg. A flux increase by a factor of ten would improve the statistics on the present measurements and speed them up, and would further allow other types of measurements to be made. However, since the amount of U-235 required to obtain the desired flux increase appears to be of the order of 10 kg, it is not felt worthwhile to utilize enriched uranium in this way.

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Applied Research Sub-Section

The first measurement of the buckling of the lattice utilizing 1.176 inch diameter slugs was made this month. This measurement was made in the 6-3/16 inch dry lattice and the buckling was found to be $77.2 \times 10^{-6} \text{ cm}^{-2}$ with a BF_3 counter and $76 \times 10^{-6} \text{ cm}^{-2}$ with indium foils. The buckling of this lattice was also measured following the enrichment experiment described above. The measurements made with the enriched material inserted in the pile have given a value which is smaller than the previous values by about $5 \times 10^{-6} \text{ cm}^{-2}$. The difference is probably to be attributed to harmonic corrections, which were not made.

A set of gold strip foils, 2-1/2 inch long and 1/8 inch wide, have been prepared for obtaining the center to surface flux ratios in uranium slugs.

The buckling of the 15-inch lattice with 1.66 inch diameter slugs is being measured to provide additional data needed for the correlation of experiment with theory. This lattice is largely of theoretical interest, since it is expected to have a very low buckling.

A theoretical study has been made to see if a set of empirical nuclear constants could be found from which the bucklings of various lattices could be calculated. To see how this study was made, consider the definition of the buckling given in the equation below:

$$\frac{k - 1}{M^2} = \text{buckling}; k = \eta f p \epsilon; M^2 = L^2 + \tau.$$

It is assumed that M^2 , which is the sum of the slowing down and diffusion lengths in the lattice, can be calculated. It is assumed that the thermal utilization, f , can also be calculated from measured cross sections; one further assumes that the value of the product, $\eta \epsilon$, is constant for a fixed slug size. With these assumptions, it is then possible to calculate from the measured difference of the bucklings of two lattices, a value for σ_{eff} which is the cross section of uranium-238 for resonance neutrons. This value of σ_{eff} is then used to calculate the resonance escape probability, p , for other lattices. Once σ_{eff} has been determined from the differences in the buckling of various lattices, it is then possible to obtain a value of the product, $\eta \epsilon$, from the absolute measured values of the bucklings. From such an analysis of lattices using standard sized slugs, the following constants which best fit this data have been determined:

$$\sigma_{\text{eff}} = 1.672 \times 10^{-24} \text{ cm}^2 \text{ for dry lattices and } = 1.596 \times 10^{-24} \text{ cm}^2 \text{ for wet lattices}$$

$$\eta \epsilon = 1.3386 \text{ for dry lattices and } 1.3319 \text{ for wet lattices.}$$

Having these values, it is possible to calculate the buckling of any lattice and compare it with measured values. The values obtained so far are listed in the table below:

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Buckling (cm^{-2}) $\times 10^6$

Dry			Wet		
<u>Lattice</u>	<u>Calculated</u>	<u>Measured</u>	<u>Lattice</u>	<u>Calculated</u>	<u>Measured</u>
<u>Spacing</u>			<u>Spacing</u>		
<u>Standard Size Slugs</u>					
6-3/16	0.96	1.99	6-3/16	30.10	30.55
7-	78.89	75.53	7-	73.95	71.78
7-1/2	101.24	101.09	7-1/2	81.93	85.28
8-	113.39	112.65	8-	83.76	83.61
8-3/8	117.72	118.45	8-3/8	81.95	81.82
<u>Small Diameter Slugs</u>					
7-1/2	98.00	95.00	7-1/2	67.00	66.40
6-3/16	111.1	115.00	6-3/16	97.60	98.19

It will be seen that the agreement in the case of standard size slugs is excellent, as it must be, since the data from these slugs were used to determine the constants. The agreement in the case of the small diameter slugs is not nearly as good. It will be necessary to measure lattices much further removed from sizes that have been presently measured in order to more fully test the validity of these constants. The real theoretical question involved here is the following. From the product, ηf , it is possible to determine η and if one does this, the value obtained is 1.29. However, η may also be determined from the measured cross sections which are used, for example, to calculate f , and the value obtained in this way is 1.35. It is not yet understood how this difference may be reconciled. A report fully outlining this work will be prepared when the calculations have been completed for all lattices measured to date.

The correct value of η can be calculated from measured cross sections if the thermal neutron spectral hardening and the velocity dependence of the cross sections of uranium can be taken into account. A preliminary calculation, in which transport theory and velocity dependent cross sections are used, shows that the number of fissions on the axis of a slug is 74% less than the value obtained with diffusion theory and velocity independent cross sections. Such calculations are to be extended in order to determine the true value of η .

Nuclear Physics

The determination of probable errors involved in the C^{12} thermal neutron cross section has been completed and will be the subject of a document to be issued shortly. The probable error in the final calculated cross section is expected to be about 7%. This includes an analysis of all constants, experimental data, and equations used. Although the error is larger than that quoted by G. R. Hennig in ANL-4410, it is believed to be more accurate, since the only error which he considered was that due to mass spectrometric analysis.

Applied Research Sub-Section

A formal report is being issued covering the work accomplished on the xenon cross section program, prior to its termination. The report is HW-28732, "Production of Xe-135 for Laboratory Purposes."

From the data obtained in the extraction of U-235 from J slugs at Arco, it has been possible to determine the burn-up of U-235 in these slugs and, therefore, the conversion efficiency of U-235 into tritium in the H-10 load. Three experimental values have been obtained from this data. They are: 0.67, 0.61 and 0.60. The value of conversion efficiency calculated from the cross sections is about 0.80. It is not at present known what the reason for the discrepancy is.

The Thermal Test Reactor arrived from Schenectady and is now in storage in the basement of the 327 Building. The shipment consisted of about 15,000 pounds of graphite and 600 pounds of mechanical and electrical equipment. Some of the graphite (about 1,000 pounds) was damaged beyond use in shipment and will require replacement.

A measurement has been completed of the attenuation of a beam of neutrons and gamma rays in neutron shielding material with varying amounts of boron. The ratios of hydrogen to boron atoms in the shielding material were 00, 456, 146, 14, and 10. Detailed curves, showing the attenuation of the neutrons and gamma rays in the shielding material, have been prepared.

A measurement of the variation of the fission to capture ratio for U-235 (and possibly Pu-239 and U-233) is to be undertaken in collaboration with KAPL. The procedure for this experiment consists of the measurement of the transmission of a U-235 foil to obtain the total cross section by measuring the incident and transmitted neutron intensity with a pair of U-235 fission foils. The variation of fission cross section will be obtained at the same time from the fission rate of the incident beam and a boron foil beam monitor. The proposals for this experiment have been discussed in some detail in document, HW-28630.

Irradiation Physics

Some data on the electrical currents produced by irradiation of semiconductors have been obtained from the P-type germanium crystal tests being conducted here by the Special Irradiations Sub-Unit for J. W. Moyer of KAPL. The relation between impedance and current is non-linear. Some of this non-linearity appears to be due to a thermal E.M.F. at one of the connections. Further data are being analyzed and collected. In addition, the possibility that thermo-electric effects alone are responsible for the observed E.M.F. of the crystals has been investigated. If one assumes optimum conditions for heat generation and a high temperature gradient, the possible thermal E.M.F. would then be about three times the E.M.F. observed, but is of opposite polarity. Evidently the fission fragment generated E.M.F. of the crystal over-rides any thermal effects that might be present.

Preliminary investigations are underway to demonstrate the possible existence of electric currents generated in uranium through the action of fission fragments.

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Applied Research Sub-Section

A method for determining the mechanism of the radiation-induced reaction of graphite with CO_2 is being explored. The method consists of a mass spectrometric analysis of the gaseous ions produced by irradiation with electrons of known speed of a system of graphite and CO_2 . The appearance potentials and relative intensities of the various ionic species (CO_2^+ , CO^+ , C^+ , O^+ , etc.) produced in the pure gas by electron bombardment have been studied previously. The nature of the reaction of graphite with these ionic species can be determined then from the relative intensities of the ion currents produced in the gas-graphite system. It is not possible to observe directly, by this method, reactions due to neutral gas molecules in excited states. A knowledge of the most likely reactions of graphite with ionized CO_2 molecules is essential to an understanding of the radiation-induced graphite-pile gas reaction.

Plant Physics

There is a possibility that some of the Pu-240 in low exposure plutonium may be the result of neutron absorption in U-239. Since the half life of U-239 is short (23.3 minutes), long exposure plutonium would not contain Pu-240 from this source. In order for appreciable amounts of Pu-240 to be produced this way, it would be necessary for the U-239 cross section to be of the order of 10^4 barns. The evidence for large cross section of U-239 is at present doubtful. Clarification should come soon, since the problem is receiving attention at several AEC sites, including Hanford.

The sample cans used for handling plutonium nitrate solutions in the Separations areas have in the past been loaded with 150 grams of plutonium. This amount is about to be increased to 400 grams. In order to determine the critically safe limit for the number of such cans which can be stored together, it is necessary to conduct an experiment involving the measurement of the multiplication of several of these cans stacked together. At present, possible methods for obtaining the required information are being studied.

CHEMISTRY

Automatic Analysis

Three separate units were introduced into the Metal Recovery plant to provide continuous monitoring of feed, waste, and product solutions. All were installed in the A process line in order to provide a true test of their combined value.

Uranium in feed solutions is monitored by means of a colorimetric unit. It provides a precision of better than $\pm 10\%$, which is adequate for control purposes, and several checks with laboratory samples have shown the accuracy to be good. Preliminary indications are that it is more reliable for monitoring uranium concentrations than is the specific gravity method. It was immediately apparent that there is a cyclic variation of uranium concentration, thus providing the first direct evidence that poor sampling plays an appreciable part in variations of laboratory results.

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Applied Research Sub-Section

Uranium in waste solution is monitored with a dropping mercury electrode employing derivative polarography. The precision is better than $\pm 10\%$, which is excellent for waste analysis, and five comparisons with laboratory results show excellent agreement.

Gamma activity in product solution is continuously monitored with a gamma scintillation counter. Although the unit operated in a highly satisfactory manner, the background level increased to an intolerable amount after four days of operation. The sampler was removed and transferred to the 300 Area where it was immediately found by use of the gamma spectrometer that ruthenium had deposited on the surface. The ruthenium in all probability existed as the metal, since hot aqua regia was the only reagent found that would dissolve it. The surface was coated with Tygon paint, but after three days' operation, high ruthenium activities were again noted. Glass and Teflon liners will be investigated in an attempt to eliminate the difficulty.

Experimentation with gamma ray absorption led to the observation that total uranium could be determined in J slugs without destruction of the slugs. Employing 0.3 Mev gamma radiation directed lengthwise through the slug, uranium in the range 0-5% may be determined with a precision of $\pm 0.03\%$ absolute. Employing a weaker radiation on the X-ray photometer directed sideways through the slug, it is possible to make an accurate analysis in the range 0-2% uranium.

Coulometric Titrations

A significant improvement in coulometric plutonium titrations follows from the observation that the interference attributed to nitrate is in fact due to nitrite, which may be eliminated by the addition of urea. Such treatment simplifies the determination and provides greater accuracy. Direct titration of dissolver solution appears feasible since titrations of six micrograms of plutonium in synthetic solutions were carried out with good recovery and a precision of $\pm 3.5\%$.

Simplifications in the coulometric uranium procedure make it more suitable for control laboratory application. A chromous reduction step replaces the lead reduction column, and formic acid removal of nitrate replaces hydrobromic acid treatment. Chemists from the 200 Area control laboratory and the Analytical Service laboratory are gaining experience with the method. Attempts to scale down the oxalic acid procedure for determining acid and to adapt it to coulometric titrations resulted in poor accuracy and were unsuccessful.

Spectrographic analyses were conducted on five samples taken at successive depths in the crevice of a ruptured slug. Impurities were found to decrease successively from the surface to the interior. Aluminum, iron, silicon, and tin appeared in the samples. Of greater interest, however, was the presence of cobalt and lead impurities, the former being 1% at the surface and the latter 1-5%. The only exception to the gradation of concentration was 5% cadmium appearing in the next to deepest sample.

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Considerable disagreement appears in the chemical literature regarding the most suitable method for performing spectrographic plate calibrations. As a result, a thorough evaluation of the various techniques had been undertaken and was completed during the month with issuance of a blue cover report on the subject. The investigation involved the selection of a stable source that provided uniform irradiation, study of optical systems, calibration techniques, plate development, and emulsion response. As a result, a highly satisfactory calibration system is available for Hanford spectrographic work.

Statistical evaluation was completed on a large number of tests carried out to elucidate the mechanism of the widely used carrier concentration spectrographic technique. Preliminary examination indicates arc current to have the greatest influence on response. It was of interest to note that the ten impurity elements under study tended to fall into three distinct groups, an observation which is unexplained but may be of great significance.

Infrared spectra were compared for a sample of synthetic "red oil" and a sample produced during the recent runaway reaction in the 321 Building. The patterns were identical in all respects. -Infrared and ultraviolet absorption spectra were measured for a group of non-volatile hexone residues that had been obtained from the Redox plant and subsequently subjected to various separations techniques. Only minor differences were noted between the various samples, and although many functional groups were identified, the spectra were so complex as to preclude positive identification of components.

Mass Spectroscopy

Research continues on development of the surface ionization technique for the mass spectrographic analysis of non-volatile materials. It involves direct production of ions by heating the sample on a tungsten filament. The first attempt to make isotopic analyses of natural uranium in this manner yielded uranium-235 results in the range 0.3-1.1%. Results during July fell in the much narrower range 0.65-0.86%. The variables under test are location and temperature of the filament, extent of vacuum, slit width, and instrumental components.

Radiochemistry

Completion of a long range program concluded in the issuance of a blue cover report that provides data relating the g/T, MWD, and plutonium isotopic contents of Hanford dissolver batches. The study included material of exposures in the range 55-700 MWD/T. It provides accurate data for converting radiochemical assays into weight of plutonium, it allows accurate prediction of expected plutonium production, and it provides accurate data on plutonium-240 concentrations.

One portion of the Hanford study involved development of a method for plutonium-241 and application of that method to dissolver solutions. A corollary of this work involved determination of the beta half-life of plutonium-241. This work

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Applied Research Sub-Section

was written up by the author as a Master's thesis and subsequently accepted by the University of Idaho.

Several other radiochemical problems involve a) a renewal of the program to determine the geometrical distribution of plutonium isotopes in irradiated slugs, b) the construction and testing of a mock-up unit to be used for recovery of plutonium from a highly re-irradiated sample, and c) construction and testing of a mock-up unit for recovering lithium iodide and tritium in assistance to Physics Research.

Miscellaneous Analytical Studies

The inclusions in two particular metallic uranium samples under study were shown to consist principally of uranium monocarbide. X-ray diffraction patterns of the samples were compared with those of known samples of uranium mono- and dicarbide, uranium mono- and dinitride and uranium dioxide. The identifications were definite. Further studies showed that the monocarbide is unaffected by the technique employed to recover inclusions from the metal.

A newly constructed electrochromatographic unit operated successfully on its first application to the separation of cobalt and copper. Projected studies include examination of ruthenium in cooperation with fission product studies directed at elucidation of the chemical behavior of this fission product.

Six standard samples involving 70 determinations by the Manufacturing Department and 30 by the 300 Area Analytical Services were completed during the month.

Waste Treatment

The extremely promising results obtained with ferrocyanide as a scavenging agent for cesium gives excellent promise of allowing the direct cribbing of Metal Recovery waste streams. Ferri ferrocyanide and copper ferrocyanide carriers provide cesium DF's of several hundred. Subsequent work shows that nickel and cobalt ferrocyanide provide DF's of approximately 10^4 which, contrary to the other precipitates, increases with time. The ferri compound hydrolyzes and cannot be used at a pH greater than five. The copper compound is applicable at pH 8; the nickel and cobalt compounds may be employed at pH 10. In the absence of a scavenging agent the turbidity in a synthetic waste sample settles at a rate that allows a volume reduction of 4.5 at pH 8 in ten days. Copper ferrocyanide provides scavenging action and gives a three-fold volume reduction in ten days. The nickel and copper compounds likewise provide scavenging and yield a five-fold volume reduction at pH 10 in ten days. A production test is planned by Separations Technology to test the scavenging action on large scale. In the event of process application of the technique there would exist a very real possibility for recovering pure radiocesium from the scavenging agent. Laboratory tests showed that the nickel ferrocyanide may be dissolved with excess cyanide to form the cyano anion, which may then be held on an anion exchange resin to allow 100% recovery of cesium from the effluent.

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DECLASSIFIEDUranium Recovery Studies

It has been suspected for some time that improved uranium extractions would result from operation of the columns at higher temperatures. Laboratory tests with the vibrational dispersion apparatus tended to verify this expectation. Dispersion studies at 20, 40, and 60 C yielded times of 65, 38 and 25 seconds, respectively, for the attainment of 90% equilibration between aqueous and organic phases.

A proposal by Separations Technology involves the reduction of the volume of nitric acid scrub in order to reduce the volume of plant waste; laboratory tests with young feed on the Mini unit showed that such treatment resulted in a two-fold increase of activity in product. Other studies showed that phosphate in Metal Recovery feed appreciably reduces the uranium extraction rate and that employment of 1 M ANN in place of nitric acid as a scrub solution increases the uranium distribution coefficient by 50%.

Metal Dissolution Studies

Work continued on the examination of a variety of techniques for dissolving irradiated slugs. Dissolution in high acid solutions containing phosphate verified previous results in showing an increased dissolving rate and a five-fold improvement in ruthenium, zirconium, and niobium decontamination in subsequent Purex extractions. A second dissolving condition involved continuous treatment with nitric oxide, NO. It was observed that less than normal quantities of uranium dissolved, that an appreciably greater reduction of nitric acid occurred, that in subsequent Purex extractions normal zirconium and niobium DF's were obtained, and that ruthenium DF improved three-fold. In previous tests with NO₂ treatment, no adverse decontamination effects were observed in Purex extraction, although Redox ruthenium decontamination was adversely affected by a factor of 10. A third set of dissolving conditions involved continuous air sparging; this treatment had no effect on subsequent Purex or Redox extraction-scrub studies.

A unit has been constructed and tested for the direct ignition of uranium pellets. A 50-50 mixture of oxygen-argon proved to be a suitable gas mixture, and it was observed that the product from ignition of cold pellets was U₃O₈. A subsequent test will include oxidation of metallic uranium with steam.

Redox Studies

A series of Redox reflux operations in the Mini unit involved a recycle of 2RF to the 2A scrub. Operating with an approximately 40 to 1 reflux, a product was obtained consisting of 40 g/l plutonium and 2 M nitric acid. Decontamination was satisfactory, but the abnormally high nitric acid reflux requires further consideration. Batch countercurrent studies at the same reflux ratio yielded a product having the same plutonium concentration but a much lower acid concentration. Cold runs on the Mini unit showed that plutonium concentrations could be built up as high as 102 g/l without precipitation.

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Scavenging studies designed for head-end application involved a pretreatment with oxalate to solublize niobium and subsequent scavenging with inactive niobium precipitated as pentoxide, and yielded a zirconium-niobium decontamination of three and eight, respectively. Digestion of a dissolver solution that was 0.2 M in acid for four weeks at 90 C had no effect on subsequent Redox type extraction but had an adverse effect of six and nine-fold, respectively, for zirconium and niobium in the higher acid Purex type extractions.

Fundamental Process Studies

An interesting observation during the course of studies with the laboratory pulse column involves the occurrence of a very marked backmixing in a matter of only several seconds. Consideration is being given to the effect of this backmixing on the process columns.

In the course of fission product studies it was observed that ionically pure Ru^{+3} could be obtained by treatment of RuI_3 with silver perchlorate and that ionically pure Ru^{+4} may be separated from the ruthenium-chloride ions in ruthenium tetrachloride solution by treatment with anion exchange resins. Both pure ion species will be employed to determine the reactions with nitric acid and its derivatives.

Previously discussed work involved the preparation and testing of a group of organic phosphorus compounds to study their ability to extract uranium. An attempt is under way to employ the beneficial effects so found through the employment of organic phosphorus polymers used as adsorbent materials. Propenyl dichlorophosphonic acid was synthesized as a starting material for the preparation of the amino and ester polymers. However, in the first preparation the material polymerized so rapidly that the desired materials were not obtained.

Waste Disposal and Decontamination

On July 1, 1953, the Chemistry Unit assumed responsibility for the radioactive waste disposal functions formerly provided by the Laboratory Engineering and Facilities Unit. At present, this includes the disposal of all liquid and dry waste originating in Building 3706 and the processing of liquid waste originating in the Works Laboratory Area, Buildings 327 (Radiometallurgy) and 329 (Biophysics). Waste disposal personnel also furnish a general service for handling limited amounts of material and SWP clothing for these facilities.

Liquid waste from Building 3706 is disposed of by means of trucking (in small containers) to the 222-S facility where it is processed to underground storage. Dry waste from this building is disposed of via the 300 Area burial ground.

Liquid waste from the Works Laboratory Area buildings of "crib" waste level is collected in two 15,000 gallon tanks. When the tanks are full, the waste is neutralized with caustic and transported in a 5000 gallon tank truck to Building 222-S for disposal to crib.

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Liquid waste of "retention" level is collected in four 25,000 gallon basins which are sampled and discharged to ground after it has been determined that retention limits have not been exceeded.

Responsibility for all radioactive waste disposal from the Works Laboratory Area will be assumed as the various buildings become operative. Chemistry Unit personnel will also operate a decontamination service within the Radiochemistry Building for the routine decontamination of glassware and equipment.

To reduce handling costs and exposure rates, it has been proposed that all liquid waste above "crib" levels and certain high level dry waste be "concreted" in 55 gallon drums when the Works Laboratory Area becomes completely operative. To this end "concreting" experiments were carried out during July by waste disposal personnel on the "patio", Building 3706, in order to determine the best mixtures and handling methods.

A summary of waste disposal activities for July follows:

3706 Building

Low level aqueous uranium waste to 300 Area pond	27 gallons
Low level organic waste to 300 Area pond	11 "
Liquid waste to 222-S Building	53 "
"High" level ice cream cartons and boxes requiring special handling	65 "

Works Laboratory Area

"Crib" level waste processed and trucked to 222-S	5,000 gallons
"Retention" basin waste processed to ground	930,000 "
Average gallons of waste delivered to "crib" by Buildings 329 and 327	300 gallons/day

Blue cover reports issued during the month include:

HW-26584 - The Isotopic Content and Specific Activity of Pile Produced Plutonium - E.M. Kinderman, H.R. Schmidt, A. Chetham-Strode, and R. Ko

HW-28530 - Spectrographic Analysis of Plutonium by the Thenoyltrifluoroacetone Extraction Method - H.H. Van Tuyl

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HW-28628 - Ruthenium Scavenging with Inorganic & Organic Sulfur Compounds -
P. T. Moore, W.W. Schulz, and R.A. Watts

Articles originating from the Chemistry Unit appeared in chemical journals during the month as follows:

M.B. Leboeuf and R.E. Connally, "Analysis of Radionuclide Mixtures Using a Gamma-Beta Scintillation Spectrometer," Analytical Chemistry

R.E. Connally, "Two Crystal Gamma Ray Scintillation Spectrometer," Note to Review of Scientific Instruments.

METALLURGY

Physical Metallurgy

Temperature Limitations - A series of uranium fuel elements which were thermally cycled by Pile Technology under temperature conditions simulating those that would exist within a pile have been examined. The two elements whose core had been heated to 730 C showed a definitely altered macrostructure in the center of the element; however, no voids or unusual orientation effects were found associated with this altered core structure. Those elements whose core temperature did not exceed the alpha to beta transformation temperature showed no change in structure or orientation as a result of cycling.

Effects of Irradiation - Improvements in the vacuum system of the dilatometer unit to be used for studying irradiated material have allowed the attainment of a vacuum of 2×10^{-5} mm. This is sufficient to allow the heating of uranium to high temperatures without appreciable oxidation occurring during the operation.

A uranium wafer cut from a fuel element which has received in excess of 1,000 MWD/T exposure has been studied by X-ray diffraction techniques. As in previously examined irradiated uranium samples, no readily evident change has occurred in either line-shape or line-position thus indicating that damage to the crystal structure has been removed during irradiation by a recovery process which was operative at the temperature at which the irradiation occurred. A more detailed study of irradiated fuel elements is planned as soon as the equipment is permanently located in the Radiometallurgy Building. In addition, a production test to irradiate uranium at low temperatures is planned in an effort to obtain more information about irradiation damage to uranium.

Slug Canning - A series of can closures in which the can wall is curled over the cap and the fusion weld formed on the face of the cap have been prepared and "warm-pressed" for one minute at about 450 C and 18,000 psi. Metallographic examinations have shown the pressed welds to be far less porous than similar welds which have not been subjected to the pressing operation. Radiographic examination of two pressed closures revealed the welds to be non-porous although some porosity was found in the central section of the cap which had been superficially melted during the welding operation.

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One closure has been made in which the cap and the can wall were coated with zinc prior to assembling. Pressing for one minute at about 450 C and 18,000 psi produced a definite diffusion bond between the cap and the can wall. Such a bond may be of value as a corrosion barrier in the event of weld failure.

The further study of the phosphoric acid-hydrochloric acid anodizing bath used to produce a surface for mechanically bonding uranium to aluminum has shown that an 18 to 1 ratio of phosphoric acid to hydrochloric acid in the bath and a current flow of about 3,000 amp.-sec. per square foot of surface seem to produce an optimum uranium surface.

Fabrication Studies - The feasibility of forming a hollow fuel element by rolling a hollow uranium billet containing a steel core has been experimentally demonstrated. A hollow uranium billet containing a steel core was rolled at 550 C to 77% reduction in area. The steel core, which had received only one-half as much reduction as the uranium during the rolling operation, was not bonded to the uranium and could be removed after rolling leaving a hollow uranium section.

An alpha-rolled uranium rod which had received a final 58% reduction in area by cold swaging has been examined. The rod was found to have a cold worked structure with an (010) type orientation in the rod direction. This rod, which had increased in hardness from Rockwell G 74 to Rockwell G 96 during swaging, also has a high yield strength and a high ultimate tensile strength.

Radiometallurgy

Examinations - Spectrochemical analyses of samples taken from the fractured area of the first Group IX split type rupture (#250) has indicated Al, Ca, Cd, Co, Cr, Fe, Pb, Si, Th, and Zn as major contaminants. The great number of stringers and the presence of a rolling seam makes it very doubtful that this slug could have satisfied the standards for metal quality. There has been no definite evidence that the canning operation contributed to this failure.

Another Group IX slug failed (#262) in tube 2671-C after an exposure of 455 MWD/T. A very unusual fracture was observed. The transverse break, one inch from the base was similar in appearance to slugs after fracture testing in 300 Area. No apparent cracks or splits were observed in the base piece, but longitudinal cracks were observed to extend for three inches from the transverse break toward the cap end.

Three cross sections were cut from an irradiated slug that had been exposed to approximately 1,000 MWD/T under PT-105-362. The cap section was mounted, polished, etched, and submitted to the Physical Metallurgy Sub-Unit for X-ray analyses. The second section was polished, cleaned and canned in argon for submitting to the Brookhaven National Laboratories for neutron diffraction measurements. The third section has been examined metallographically to reveal microstructure similar to sections removed from slugs exposed approximately 600 MWD/T.

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An examination of the welding procedure used in sealing the sample cans for in-pile testing the effect of irradiation upon aluminum corrosion has indicated the possibility that the welding fixture may have allowed excessive heating of the test coupons. This effect could modify previous results based only upon the effects of the neutron flux. Another in-pile test has been started with an additional 84 metallurgically controlled samples being used as spacers for the corrosion specimens.

Facilities

The Radiometallurgy Building (327) was accepted by the A.E.C. and turned over to the General Electric Company on June 29, 1953. Occupancy by the Radiometallurgy Sub-Unit began on July 1, 1953.

The first work on irradiated materials was performed when a sample for spectrochemical analyses was obtained from a defective vertical safety rod.

A rough draft of the Building Operating Procedures has been written for discussion with Safety, Fire Protection, Radiological Sciences and Maintenance personnel.

The Zeiss metallograph has been installed and placed in operating condition at cell C.

Preliminary testing of the Bergsman microhardness tester with standard hardness blocks show that hardness values obtained are 10% lower than the standards when loads of 500 grams are used.

Drawings of a remote handling drill to obtain samples for chemical analyses from radioactive pieces have been completed. Fabrication has begun at the 100-D Technical Shop.

Plutonium Metallurgy

Metallographic Preparation - The metallographic hoods and equipment have been completed and operate satisfactorily. Practice runs with non-radioactive materials are being made prior to plutonium work.

The Tukon hardness tester has been realigned, tested with calibration blocks, and is now ready for service.

Stress-Rupture Studies - Stress-rupture tests have been carried out on the former RG line bomb casing material. The carbon steel specimens were tested under conditions simulating the standard and off-standard pressures and temperatures which have been observed in actual plant operations. The RG line casing material was found to rupture after about 63 and seven cycles for standard and off-standard conditions, respectively.

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Thermal Analysis - Since the thermal analysis hood has been sealed and an expanded range added to the recorder-controller, the entire apparatus is now ready for plutonium investigations.

Physical Properties of Plutonium - A plutonium tensile specimen was prepared by pouring molten plutonium into a magnesia mold. The "as-cast" plutonium test piece was pulled in tension until failure which occurred at the location of an oxide inclusion within the reduced area of the specimen. The use of SR-4 strain gages provided sufficient data for the calculation of the Modulus of Elasticity. The value of this constant was found to be about 13.7×10^{10} psi which indicates that a considerable fraction of the "as-cast" metal contained alpha phase plutonium.

Plutonium Skull Studies - If plutonium oxide is reduced to the metal by molten barium, a method for the continuous recovery of plutonium from skulls might be feasible. Further, this operation may be of the "open-pot" type providing the molten barium is covered by a low melting flux.

A portion of a plutonium skull and its associated oxide was charged into a melt containing barium metal covered with a calcium chloride flux. Since this low density flux was appreciably soluble in plutonium metal, the separation of plutonium metal from the slag was poor. In addition, the dissolution of the protective flux in plutonium permitted the oxidation of barium and plutonium by air.

Wet Plutonium Fluoride Studies - Ammonium plutonium fluoride cannot be used in sealed reduction bombs since ammonium fluoride volatilizes at elevated temperatures and raises the internal pressure of the bomb beyond safe operating limits. If the plutonium double salt is furnace dried at 250 to 300 C, the evolved ammonium fluoride is found to condense and plug off-gas lines. Further, bomb reductions carried out on plutonium fluorides prepared by wet methods have, thus far, produced metal of low quality. The use of the ammonium plutonium fluoride in plant operation does not appear feasible.

Calcium plutonium fluoride is easily prepared, washed, and filtered. Upon drying, the anhydrous fluoride is found to be composed of hard lumps. The use of this material in the reduction bomb would not, however, introduce any foreign substance into the reaction mass. The first bomb reduction carried out produced plutonium metal of poor quality. Additional bomb reductions are being performed with higher booster contents.

Electroless Nickel Plating Studies

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Replacement of Hydrofluoric Acid in 234-5 Operations by Phosgene - Preliminary corrosion experiments have shown phosgene to attack most common materials of construction rapidly at temperatures of about 600 C. However, since chlorination of plutonium dioxide by phosgene should be operative at temperatures of 450 C or below, additional corrosion tests at these lower temperatures are planned.

The plutonium remaining in the slag and crucible fragments after a trichloride reduction can be recovered through Recuplex facilities providing chloride ion is first removed. Although the bulk of the chloride ion can be removed by water washing, about 0.1 g/l Cl is found in the Recuplex solvent extraction feed solution. The presence of chloride ion at this point is attributed to the slow dissolution of partially oxidized plutonium chloride or to the slow leaching of soluble chlorides which had adsorbed into the magnesia crucible fragments during bomb firing. The presence of about 100 ppm of chloride in the dissolver is probably tolerable but corrosion tests must be carried out to confirm this conclusion.

Cerium trichloride reductions have been carried out in a sealed bomb containing a resistance wound heater and several concentric heat shields. This type of bomb design may permit the elimination of internal boosters. Preliminary bomb reductions using cerium chloride and no booster have resulted in metal yields as high as 93.8%.

Corrosion and Welding

Failure of the Tube Nest in the TD-4 Fractionator - 224-U Building - Although all failures of the tube nests in the TD-4 fractionator have been due to weld crater corrosion, crevice corrosion was also apparent on the tubes at the juncture of the tubes and tube sheet. For heat exchange equipment of the type where the corrosive media is on the outside of the tubes, it is recommended that the tubes be welded to both sides of the tube sheet to eliminate the crevices.

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Redox D-12 Tube Nest Studies - Portions of the tube nest from the Redox D-12 waste concentrator have been removed from the vessel and partially decontaminated. These specimens have been moved to the 111-B Building where they will be sectioned for metallographic examination, chemical analysis, and corrosior testing.

Corrosion Resistance of Type 304L and 309SCb Stainless Steels to Nitric Acid - Dichromate Solutions - The corrosion resistance of type 304L and 309SCb stainless steels is being tested in boiling solutions containing 10-60% nitric acid and 100-10,000 parts per million of chromium (VI). It is found that the specimens suffer intergranular attack, and the rate of attack increased with both the nitric acid and dichromate concentration.

Evaluation of Pickling Process for ED-1 Evaporator - 224-U Building - A solution of 5% hydrofluoric acid at 80 C can be used for scale removal in the ED-1 evaporator. Since 309SCb is attacked at a rate of 0.03 inches per month, pickling treatments of short duration are recommended.

Sintered Stainless Steel Frit Failures - 231 Building - Several type 309SCb stainless steel frits which are used in the 231 Building for filtering plutonium peroxide slurries have failed in service. Examination of an unused frit showed that the filter medium was composed of innumerable cross-linkages about 0.002 inches diameter. Solutions that are only mildly corrosive to stainless steel plates are expected to produce rapid frit failures.

Oxalic Acid Screening Test for Stainless Steels - The criterion which is used to reject poor heats of stainless steel when examined by the Oxalic Acid Etch Test is the presence of one or more grains encircled by a ditch. It is observed that grains encircled by ditches occur more frequently in regions of the specimen which have been cold worked. It is important, therefore, to remove all cold worked metal before testing otherwise good quality metal is likely to be rejected.

Corrosion Resistance of Stainless Steels to Sulfide and Mercaptan Solutions - No attack was observed on type 347 stainless steel coupons which were exposed in a 2 M UNH, 0.1 M HNO₃, 0.05 M di-mercapto-propanol-1 or 0.05 M beta-mercapto-propanoic acid, 0.025 M silver nitrate solution for 240 hours at 50 C. Passivated stainless steels types 347, 304L, and 309SCb possess adequate resistance to corrosion in the test solutions, and are satisfactory materials for plant use.

Field Corrosion Test: Bismuth Phosphate Waste Solutions in Low-Carbon Steel Tanks - SAE 1020 steel corrosion test coupons have been removed from the Bismuth Phosphate waste storage tanks after an exposure of about seven months. Two specimens, one sand-blasted and one polished, suspended in the vapor over the Bismuth Phosphate metal waste solution were severely attacked. Although the uniform corrosion rate was found to be only 0.2×10^{-3} inches per month, severe pitting had occurred. Deep pits were observed on all parts of the specimens; the deepest pit was 0.0118 inch while the average pit depth was about 0.006 inch. If the pitting rate on the tank liner is constant, the life expectancy of the tank is about 20 years.

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Weld Closure of Unbonded Specimens - A method has been developed for making a sound, reproducible weld closure of unbonded specimens for special production tests. Samples of welded cans are being prepared and will be subjected to an autoclave test for closure evaluation.

INVENTIONS

All Applied Research Sub-Section personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during July, 1953, except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

<u>Inventor(s)</u>	<u>Title</u>
C.E. Michelson, W.P. Van Meter, and W.N. Carson	The Automatic Estimation of the Uranium Content of Process Streams with a Photometric Device
G.J. Alkire, K. Koyama, and C.E. Michelson	The Automatic Estimation of the Uranium Content of Process Streams with a Polarographic Device

No report will be issued concerning the invention reported in the May Monthly Report, "Chlorine as an Agent for Destroying Ruthenium Nitrite Complexes in Dissolver Solution," by A. S. Wilson.

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

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MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

Charles Palmer, Panascan, Inc., Chicago, Illinois, visited HAPO July 9 - 13 to install Flexowriter on 105-C Temperature Monitor.

T.M. Shepherd, Knolls Atomic Power Laboratory, General Electric Company, Schenectady, N.Y., visited HAPO July 10 - 21 for consultation on instrumentation engineering and operating procedures.

N.F. Fuller, General Engineering Laboratory, General Electric Company, Schenectady, N.Y., visited Richland July 15 for consultation concerning mechanical equipment for the RMA Line.

J.T. Rayner, Bingham Pump Company, Portland, Oregon, visited Richland July 29 to discuss "K" Area process pumps.

B.E. Woodward visited Panellit, Inc., Chicago, Illinois to define design details on Temperature and Pressure Monitor Systems, Project CA-512, June 30 - July 3.

J.R. Carrell visited the Palmer Studios, San Francisco, California, for technical assistance on the 105-C graphite movie, July 1.

W.J. Love attended the Heat Transfer and Fluid Mechanics Institute Meeting, Los Angeles, California, July 1 - 3.

Ezra Hollister visited the Puget Sound Naval Shipyard, Bremerton, Washington for inspection of canning machine fabrication and assembly July 3 and July 15 - 17.

H.S. Davis visited the Iron Mt. Mine, Montello, Nevada, for limonite consultation July 6.

J.C. Wood visited the Mesta Machine Company, Aetna Standard Manufacturing, United Engineering Company all of Pittsburgh, Pa.; Wean Manufacturing Company, Warren, Ohio; Youngstown Machine and Foundry, Youngstown, Ohio July 4 - 9 to discuss 100-K horizontal rod fabrication and the Aluminum Company of America, Lafayette, Ind., July 13 to discuss 100-K horizontal rod extrusion.

L.C. Koke visited American Machine Foundry Company, New York City, July 6 - 8 to inspect duPont design can opener, and visited Ingersoll Rand, New York, to discuss glass blower characteristics, July 7.

T.F. Robinson visited Pacific Oerlikon Company, Tacoma, Washington July 14 to expedite procurement of parts for CA-512-R.

E.L. Reed visited Puget Sound Naval Shipyard, Bremerton, Washington July 15 - 16 to inspect canning machine assembly.

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Design Section

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R.C. Hoffman visited the General Electric Company, Schenectady, N.Y., July 20 - 23 to discuss motor application on RDS-D-11 study.

A.J. McCrocklin visited the Puget Sound Naval Shipyard, Bremerton, Washington July 21 - 23 to check electrical controls on canning machine.

E.B. LaVelle visited the Puget Sound Naval Shipyard, Bremerton Washington July 27 for inspection of off-site fabricated weldments.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	June 30			July 31		
	Non-			Non-		
	Exempt	Exempt	Total	Exempt	Exempt	Total
Design Management	2	1	3	2	1	3
Process Engineering Sub-Section	59	12	71	59	12	71
Design Planning Unit	16	13	29	16	13	29
Design Engineering Sub-Section	84	12	96	84	12	96
Total Section Personnel	161	38	199	161	38	199
Technical Graduates (Rotational)	-	12	12	-	9	9
TOTAL	161	50	211	161	47	208
Personnel on loan to Design Section			1			0
Temporary loan from ANP			3			3
Accessions -	2					
Separations -	5					

GENERAL

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

	Man Months Expended	% of Total
1952 Expansion Program	102.3 *	65.8
Research and Development	28.8	18.5
Other Projects and Design Orders	24.4 *	15.7
	155.5 *	100.0

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

Due to recent general salary increases and increases in the cost of services to the Design Section, the standard liquidation rate for engineering was raised to \$47.00 effective July 1, 1953, an increase of \$3.00 above the previous rate and approximately \$2.00 above the actual rate for the last quarter of FY 1953.

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DECLASSIFIEDDESIGN DEVELOPMENTStatistics:

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

	<u>Man Months Expended</u>	<u>% of Total</u>
RDS-D-10 Reactor Design Development	2.3	8.0
RDS-D-11 Water Plant Design Development	14.2	49.3
RDS-D-12 Separations Plant Design Development	1.1	3.8
RDS-D-13 Mechanical Design Development	5.4	18.8
RDS-D-14 Utilities and Services Design Devel.	2.4	8.3
RDS-D-15 Engineering Standards and Materials Development	3.4	11.8
	28.8	100.0

Fiscal year 1954 research and development study authorizations were issued July 1, 1953.

RDS-D-10 - Reactor Design Development

The training documentary film entitled "105-C Graphite" has been completed. The film shows the laying of the 105-C graphite and is currently being shown throughout the plant.

RDS-D-11 - Water Plant Design Development

A project proposal, Reactor Plant Modification for Increased Production was prepared. The proposal requests \$100,000 for initiation of design of modifications to reactor plants B, C, D, DR, F and H to increase production capacity. The proposed changes in water plants would increase the flows to the reactors at least 100,000 gpm at "C" Area, and 65,000 gpm at other areas at a cost, based on preliminary study-stage estimates of \$30,000,000.

The study to determine the best methods of accomplishing major increases in water supply necessary for increased production was continued with the objective of the development of a scope basis for the proposed water plant modifications. The content of criteria to define this basis was outlined, and work is proceeding with the preparation of scope drawings and criteria sections for the dual 100-B-C Area.

A review of the 100-C process pumping system has shown the desirability of adding two identical pumps in the process pump house. The modifications to the 100-B process pumping system will be determined from an economic analysis of several alternative plans, each of which consist of adding to or substituting electric-driven pumps for normal operating use. In each instance, the steam-driven primary pumps are retained on a standby basis to provide emergency cooling water in the event of an electrical outage. A review of the process pumping system has shown that the 100-C Area piping is adequate but that changes will be required in the 100-B Area.

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An engineering basis was formulated (HW-28739) for the conversion of existing filter plants to the alum-activated silica process and the modifications necessary to the present installations to meet the over-all flow requirements of each area. The conversion to this new process will be justified separately from the anticipated water plant expansion program because of operating process advantages.

RDS-D-12 - Separations Plant Design Development

The principle of remotely removable heat transfer surfaces as applied in the design of the new D-12 waste concentrator for the Redox Plant is being extended to the F-2 Uranium Concentrator, the D-15 ANN Evaporator, and the G-3 Organic Still. These new concentrators are required for the operation of the Redox Plant at the anticipated Phase II rates. Removable heat transfer surfaces are desirable to combat the problem of increased corrosion anticipated with back-cycling of wastes containing ANN (aluminum nitrate nonahydrate) and to permit interchangeability of the various units. All four units use identical removable heat transfer facilities.

RDS-D-13 - Mechanical Design Development

Assembly work and preliminary operational trials of the prototype fuel element canning machine at the Puget Sound Naval Shipyard are complete and shipment to Hanford is scheduled for August 5. Preparation in the 314 Building for installing the machine is progressing satisfactorily; the tracks are laid, the furnace dolly is in place and all the deck framework is installed. The Ajax furnace was received and all lining installation is completed.

Preliminary design sketches have been nearly completed on a sampling mechanism for an automatic alpha counter. The design has been developed with a prototype installation in the Redox sample gallery as the most likely location for a test demonstration of the instrument's potentialities.

The design study of a meter to measure centrifuge eccentricity was continued and two alternate pick-up coil designs were evaluated.

RDS-D-14 - Utilities and Services Design Development

A reply was received from the AEC in response to the transmittal of a document (HW-28414) by the General Electric Company concerning reactor cooling water, emergency supply. The Commission expressed agreement with the recommendation that proceedings on exploratory wells as a source of emergency water supply be stopped and requests that the general study of emergency cooling water supply continue.

RDS-D-15 - Engineering Standards and Materials Development

Cost plus estimated commitments to date for development of engineering standards is \$21,200.

Work was started or continued on the following work for fiscal year 1954:

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- a. Additional welding standards will be prepared. At the present time there are two previously scheduled specifications to complete.
- b. Work was started on the preparation of a specification for oxalic acid etch screening test of stainless steels.
- c. Investigation of the use of nitrogen as a substitute for argon in the welding of stainless steel is nearly complete. One re-check to verify a safety point is being made before unqualified acceptance is given.

DESIGN PROJECTSStatistics:

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

	<u>Man Months Expended</u>	<u>% of Total</u>
CA-512-R 100-K Reactor	62.4	49.2
CA-512-W 100-K Water Plant	4.3	3.4
CA-513 Purex Separations Facility	17.4	13.7
CA-514 300 Area Expansion	12.8	10.1
CG-551 Expansion of Building 234-5 Facilities	5.4	4.3
Major Projects - Other than Expansion Program	21.4	16.9
Minor Projects and Design Orders	3.0	2.4
TOTAL	126.7 *	100.0

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

CA-512-R - 100-K Reactor Facilities

Design progress on Project CA-512-R, 100-K Reactor Facilities, was advanced 5.8% during July to 95.1% complete. During the month, 69 drawings were approved, bringing the total to 1737 drawings which have been approved to date.

Expenditures to date are approximately \$1,645,800 against an authorized amount of \$2,781,500. The rate of expenditure is dropping to the order of \$98,000 per month.

Nine hundred and ten requisitions have been issued by the Design Section for procurement of engineered items for the 105-KW and 105-KE facilities. The total value of this equipment is approximately \$15,956,000.

It was decided to replace the front face orifices and adaptors with venturi tubes in the central zones and double orifices in the fringe zones of the reactor at an additional cost of \$5.00 per process tube. The additional investment will be returned in less than one year through decreased power costs. The flow in the central tubes will be monitored with greater precision, thus removing one obstacle to attainment of higher temperature rise of the water in the tube, and permitting exploration of higher power levels than would otherwise be obtainable.

Considerable progress has been made on the 105-K Process Unit Model. The central block was fabricated and several of the small components such as step plugs, valves and the ball gravity trough have been completed. Present status would indicate that the model will be completed on schedule.

A study was carried out to determine the maximum temperature attained by a 100-K horizontal control rod at high power levels, and high enrichment. At a power level of 3,000 MW with an inlet water temperature of 70° F and a cooling water flow rate of eight gallons per minute per rod, the maximum control rod temperature was calculated to be approximately 370° F with cooling water pressure drop of two psi in the tip section. These values are within limits which enable satisfactory operation of the control rod system at high power levels.

The use of expansion joints on the rear face risers and crossheaders has made the rear risers and crossover pipes essentially free bodies. Because of this, it was necessary to design supports for these components that will withstand large side thrust forces in addition to the normal load of the components themselves and the weight and dynamic forces of the water flowing in them.

Design criteria and scope drawings of the 100-K Water Studies Laboratory were prepared and approved. The scope drawings cover the laboratory architectural layout, the site plan and the process diagram while the design criteria contain the technical requirements and the description of the physical facilities. The preliminary cost estimate of the laboratory is \$893,000.

CA-512-W - Water Plant Facilities

The diatomaceous earth filter of the type recommended and approved for the 100-K Area sanitary water system was recently tested to establish the filter's efficiency. The quality of the filtered water was such that with chlorination it would be good sanitary water and thus demonstrated the feasibility of such a system. The filter showed capacity to handle any amount of turbidity that was present during the high stages of the river this year.

There is some indication from these tests that this filter might produce water suitable for process water. From a chemical analysis of the water, it can be seen that the filter materially reduced the iron and turbidity as well as the copper, manganese and total solids. It will be recommended that these tests be continued by the Technical Section to evaluate the filter for possible process use.

Study of the electrical system on the analyzer board has progressed to the point that all calculations of a short circuit study of the 100-K electrical system have been completed. A letter summarizing recommendations to be made was issued and the detailed report is nearing completion.

CA-513 - Purex Facility

Detail design of the Purex Waste Facility was advanced 13% during the month to 50% complete based on 134 drawings required for construction exclusive of standards or study drawings. Design scope for the Purex waste storage tanks was

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revised to handle stored waste having a specific gravity of 2.0 instead of 1.4 as was used in the design of the Redox tanks. This necessitated a redesign of the tanks and resulted in a tank wall thickness of 3'-0" based on design assumptions used to date.

Over-all design of the Purex Outside Facilities was advanced 2% during the month to 88% complete. There were 18 drawings approved for construction, four drawings were issued for comment and approval, two specifications were approved, and seven requisitions were written. Three vendor's approval drawings were reviewed and approved.

Design work on CA-513-B, UO₃ Plant Expansion, is 98% complete, an advance of 1% during the month. All design is complete with the exception of final instrument design which has a "hold" pending receipt of vendor instrument information.

Design was completed for the installation of a water demineralizer system for the Purex Prototype Facility.

Review of electrical and instrument drawings submitted by the Vitro Corporation was continued during the month.

The construction of two models of the 202-A Purex Building was approved and preliminary work started. One model (scale 1" = 20') will show the entire 202-A Building with removable sections which will separate the building on horizontal planes and upon which the floor plan and process vessels will be painted. A second model of the 202-A Building (scale 1/4" = 1') will show details of the H and J cells and control room. The work is scheduled to be completed by October 1, 1953.

The Purex Plant concentrators were rescoped and are being redesigned by the Vitro Corporation. The new scope incorporates (a) additional heat transfer surface to give added capacity potential and to permit operation at temperatures below which explosions have occurred in laboratory tests, (b) additional instrumentation which will warn of and preclude the approach of critical temperatures, and (c) remotely removable heat transfer facilities to decrease the vulnerability of continuous operation from corrosive attack. The tubes will be of the canister type.

The carbon steel waste line between the Purex Plant and the C-Farm Dimension Box was changed to stainless steel to permit transfer of waste metal solution to Purex for recovery. The recovery of only a few tons of uranium via Purex instead of TBP will return the added investment of \$25,000. Earlier shutdown of TBP, with savings of \$125,000 to \$250,000 per month may be possible through the use of the above line.

Design of the Hot Semi-Works Conversion, CA-513-D, was started during the month upon receipt of authorized funds. Progress at the month's end was approximately 9% complete. Design Section's effort was primarily applied to following design scope being performed by the Technical Section and to the preparation of advance ordering of materials. Work was started on C-cell piping alterations. About 60 drawings will be required for the Design Section portion of the job.

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CA-514 - 300 Area Expansion

Detailed design work on the 300 Area Expansion Program, exclusive of the addition to the 313 Building structure and services which are being done by an architect-engineer, was advanced 10% during the month to approximately 52% complete. Design activities were concentrated on the 313 Building process equipment and remodeling of the existing structure. It was decided to leave space in the finishing and inspection lines to accommodate radiographic weld inspection equipment. The nitric acid mix tank in the slug recovery room will be eliminated because the acid can be diluted in the nitric acid process tanks during the initial bath change. The architect-engineer submitted final architectural, mechanical and electrical drawings and specifications for review. Work sheets showing proposed equipment layouts in the existing building and new addition were issued for comments and are currently being revised.

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

A total of 1286 drawings for CG-431-B are being revised to the as-built status. Revision instructions have been written for 1199 drawings and work has been completed on 550 drawings. At the request of the Project Section an evaluation was made to determine the necessity of using all available ball hoppers at the "C" reactor in view of the anticipated high enrichment in the fringe areas. It was concluded that the six inoperative hoppers should be placed in operation.

CG-496 - Recuplex Installation - 234-5 Building

Detailed design of the Recuplex Installation is approximately 95% complete, an advance of 5% during the month. Twenty-one drawings were approved during the month bringing the total of approved drawings to 192, of the 231 required. Seven new requisitions were issued. The transfer line system between Task I and the hoods was simplified. This simplification was made possible by a modification of requirements by the Technical Section and the Manufacturing Department.

CA-431-C - Metal Examination Facility Equipment

Design work on the underwater metal examination equipment at 105-C advanced to 7% complete, an increase of 2% during the month. A total of 85 drawings will be required and three drawings were issued for comment.

CA-535 - Redox Capacity Increase, Phase II

Final design for Redox Capacity Increase, Phase II is 40% complete. This is a revision downward from the 70% reported last month which was brought about by substantial change of scope in design of the project. A drawing schedule listing all jumpers, columns and vessel modifications for Redox backcycle and Phase II Expansion was issued. Of the 146 required drawings, 43 have been completed and issued and four are ready for approval. Design completion date is estimated to be February 1, 1954.

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Detail design of the Redox Tank Farm was advanced 1% during the month to 90% complete. Six drawings were approved and eight drawings were issued for approval. Fifteen construction contractors' drawings were reviewed and approved "As Noted". Consideration is being given to the question as to whether four or five additional tanks, beyond the 15 originally authorized, should be constructed in view of the fact that funds are available, and in view of the possibility of self concentration of wastes.

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

Design work on the Activation of Task I, Building 234-5 is approximately 14% complete, an advance of 4% during the month. A drawing schedule of 94 drawings was prepared and issued including thirty-one electrical, three instrumentation and sixty mechanical drawings. Estimated design completion date is January 15, 1954.

CG-550 - Reactivation of P-10 Facilities

Detail design on Reactivation of P-10 Facilities advanced 30% during the month to 65% complete. Thirty-one drawings were issued for approval and 55 have been issued for comment, out of 97 required drawings.

CG-551 - Expansion of Building 234-5 Facilities

Design work on Expansion of Building 234-5 Facilities was advanced to approximately 22.7% complete during the month. As requested by the AEC, a letter was prepared containing the justification for (1) the estimated design cost of \$136,000 and (2) the necessity for pre-assembling and testing the equipment before installation in the 234-5 Building.

The extent of the shielding required for the Task III replacement has been resolved by making tests of materials using the actual product as a source. An addendum to the basic scope requirements is being prepared, together with test results, shielding calculations, and an architectural arrangement of the proposed shielding walls.

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

The switchgear drawings resubmitted by the vendor were approved. Layout and control diagrams for the Control Console associated with the electrically operated switchgear are being prepared.

D.O. 100422 - Improved Lighting for 761 and 762 Buildings

Four drawings were revised to make the arrangement conform to the new partitioning.

D.O. 100526 - P-13 Pressure Assembly Removal

Design was continued on the P-13 pressure assembly removal and six drawings have been forwarded for approval. One additional drawing was issued for comment and when approved, the job will be completed.

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

Detail design was continued on the revisions to the existing Ball Recovery System and eight mechanical drawings were issued for comment. Twenty-eight out of a total of 48 electrical drawings have been issued for comment.

D.O. 100586 - Preliminary Electrical Design, Building 713

Prints of this building were marked up for the estimators.

D.O. 100607 - Richland Lutheran Church Building

A structural investigation was made of the building housing the Richland Lutheran Church and a rough draft of a report presenting the results and recommendations was prepared.

DESIGN SECTION WORK IN THE CLOSING STAGES OR COMPLETED DURING JULY

- D.O. 100402 Repair of 105-D Reactor Effluent Line
- D.O. 100476 Positive Ion Accelerator Laboratory
- *D.O. 100580 Painting Specifications for Meteorology Tower, 622 Building
- *D.O. 100583 Redox Waste Evaporator Redesign (D-12)
- *D.O. 100584 New Bio-Assay Laboratory

* Design Section work completed during July.

INVENTIONS

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

InventorSubject

R.R. Cone

Null Balance Indicator

Manager - Design
ENGINEERING DEPARTMENT

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DESIGN SECTION WORK STATUS

Design Section

HW-28906

PROCESS ENGINEERING UNIT ENGINEERING MAN MONTHS *

Description	Backlog Start Of Month	Orders Received During Month	Time Spent During Month	% of Total Effort	Backlog End of Month	Aug. Sept. Oct. Nov. Dec. Jan. Balance				
						25	18	12	11	11
CA-512-R	361.7		25.0	48.2	336.7	1	1	1	1	1
CA-512-W	32.3		1.0	2.0	31.3	3	2.5	2	1.5	1.5
CA-513	22.2	4.0	3.1	6.0	23.1	2	1	1	1	1
CA-514	26.6		2.2	4.2	24.4	2	2	2	2	2
CG-551	38.7		2.6	5.0	36.	20	4.5	7.5	8	8
Reactor Plant Modification	418.0		16.9	32.6	401.1	1	23.5	27	29	29.5
RDS Program	26.4	1.0	1.0	2.0	26.4	54	1.5	1.5	1.0	1.0
Design Orders	925.9	5.0	51.8	100.0	879.1					
TOTALS										

DESIGN ENGINEERING UNIT ENGINEERING MAN MONTHS *

Description	Backlog Start Of Month	Orders Received During Month	Time Spent During Month	% of Total Effort	Backlog End of Month	Aug. Sept. Oct. Nov. Dec. Jan. Balance				
						25	18	12	11	11
CA-512-R	124.4	-	24.0	32.0	100.4	18	15	13	12	10
CA-512-W	34.8	-	3.3	4.4	31.5	3	2	2	2	1
CA-513	75.0	6.3	11.6	15.5	69.7	11	11	6	3	2
CA-514	38.2	1.0	8.0	10.7	31.2	8	6	4	2	2
CG-551	23.0	-	1.4	1.8	21.6	2	3	4	3	3
RDS Program - FY 1954	223.5	-	6.1	8.1	217.4	9	11	16	21	23
Major Projects - Other	111.2	21.4	17.6	23.5	115.0	18	18	16	14	10
Minor Projects & Design Orders	62.7	3.9	3.0	4.0	63.6	6	8	8	10	10
Available for Anticipated										
Future Work										
TOTALS										

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

	Authorized Projects	Anticipated Future Work	Total
Architectural & Civil	97.6	33.0	130.6
Mechanical	212.9	44.0	256.9
Electrical	160.5	41.0	201.5
Instrument	138.2	26.0	164.2
Standards	41.2	13.0	54.2
TOTALS	650.4	157.0	807.4

* Exclusive of technical graduates and people on loan from other sections.

MONTHLY NARRATIVE REPORT - JULY 1953

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

Information meetings for Project Section were held during the last week of July. Seven meetings were attended by 496 people. In general, the programs included remarks by the Section Manager on aims and objectives, the functions of groups in overall accomplishments of the Section, and a question-and-answer period. The classified training film, "105-C Graphite" was shown at each meeting, and the educational film, "A is for Atom", was added to two meetings in the field.

The increase of personnel, though still below the budget, is adequate for present needs because several major projects are behind original schedules. There are requisitions for one inspector, a few clerks and stenographers, and about 30 expeditors to be added to the payroll when the 100-K graphite program reaches full production. Following is a summary of personnel data for the Project Section covering July, 1953.

	<u>July 1, 1953</u>	<u>July 31, 1953</u>	<u>Net Change</u>
Employees on Payroll	550*	566	+16
Technical Graduates-Rotational	13	15	+ 2

The end-of-month status involved these changes:

	<u>Project Section Personnel</u>	<u>Tech. Grad. - Rotational</u>
Payroll Additions	10	
Payroll Removals	5	
Transfers into Section	13	2
Transfers from Section	2	
Transfers within Section	7	

*Increased by two over June total through transfers which were effective July 1, 1953.

B. SCOPE OF ACTIVITIES

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox Production Plant, 1%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.8%; CG-438, Ball Third Safety System, overall, 96%; CG-496, Recuplex, 19%; CA-506, Repairs to 100 Areas Retention Basins, overall, 99%; CA-512, 100-K Area Facilities - Water Plants, KW, 26%, KE, 18%, Reactor Buildings, 105 KW, 17%, KE, 10.7%; CA-513, Purex Facility, Part "A", 5.7%, Part "B", 38%, Part "C", 99%; CA-514, 300 Area Expansion, overall, 7%.

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C. MATERIAL PROCUREMENT

The vendor of crates for reactor biological shielding is making good progress on fabrication, about two per week. Other vendors for thermal shielding blocks are gradually solving problems of fabrication. The downcomer approach section has been re-worked until it is acceptable. Three serious difficulties threatened to delay the K Area Reactors. The vendor has failed to produce acceptable process tubes; the limonite contract is being cancelled because of poor quality; and a contract for the horizontal safety rod drives has not been awarded.

Material for about 100 Recuplex vessels is being prepared for shipment to the fabricator in Los Angeles. An order for 30 Purex vessels was placed in the Cleveland area. Development of the liquid-liquid centrifuges for Purex has progressed to the stage of actual work on the 40-inch centrifuges. Some progress was made toward inspection and procurement of other materials and equipment for 100-K Facilities, Purex, P-10, and related projects.

Delays, estimated at three weeks, in procurement for Conversion of Hot Semiworks have been caused by local screening of requisitions. A consultant from Puget Sound Navy Yard has recommended a solution to the problem of sealing joints in the 100 Areas Retention Basins. He has forwarded a gallon of special Thiokol for local examination and testing.

D. CRAFT LABOR

Negotiations continued with sheetmetal workers who are attempting to make their area agreement applicable to Hanford. Asbestos workers have refused to dispatch men in an attempt to make their area agreement effective at Hanford. Teamsters have begun exerting pressure on the long-standing issue of isolation pay for craftsmen who also drive construction buses to and from the areas. The question of travel allowance for carpenters who are being employed by Kaiser Engineers was heard by the arbitrator on July 10, 1953. The arbitrator later ruled in favor of Kaiser Engineers.

The five-week dispute between Blaw-Knox and the Plumbers' Union was concluded the week ending July 10, 1953. Blaw-Knox agreed to reinstate the four previously discharged foremen and to use expeditors while hauling piping materials. A jurisdictional dispute between carpenters and sheetmetal workers caused a work stoppage by seven sheetmetal workers on July 2. Even though the local union called the strike a "wildcat", it spread to include all Kaiser sheetmetal workers. The union returned the strikers to work on July 8, 1953. One phase of the jurisdictional dispute between millwrights and machinists in 2101 Building was temporarily settled during early July by assigning the changing of cutters to millwrights and allowing machinists to stand by. Following a walkout, picket lines, and more negotiation by millwrights, work was resumed on July 29.

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E. SAFETY AND SECURITY

Seven regular meetings for discussion of Safety, Security, and Health topics were attended by about 340 personnel. A special mass safety meeting was held in 200-W for all employees of G. E. Minor Construction, J. A. Jones Construction Company, and their subcontractors. Field forces conducted the following meetings: special hazards - 2, Monday morning "tool box" - 4, and foremen's meetings - 1. A training film which depicts special hazards encountered by Minor Construction personnel was prepared for an initial showing on July 16, 1953.

F. HIGHLIGHTS OF UNIT ACTIVITIES

Inspection, Drafting and Estimating Sub-Section: Inspection workload increased substantially through activation of orders for 100-K Area and initial activities on procurement for Separations Projects. Inspectors completed 33 orders. There were 163 Program "X" requisitions submitted, and 148 Program "X" orders placed during the month. Drafting production was 332 new drawings, 18 charts and graphs, and 505 revisions. Drafting for CA-512 was 97.1% complete, and scope drafting for redesign of the Purex Evaporator was completed. The Reproduction group produced 771,735 square feet during the 20 regular working days of July. The Estimating group completed 30 estimates, of which 14 were project proposals. Field Surveys group began field work on a topographical map of the proposed new Elementary School area, and also provided services to the A.E.C. and several of its contractors.

Minor Projects Sub-Section worked on 54 project items and three informal requests, representing an estimated total of \$24,089,400. Completed work consisted of two projects, one informal request, and one engineering request. Four project proposals were transmitted to sponsors. Five project proposals were approved at the A&B meeting. Four authorizations were granted by the A.E.C. Two projects and five engineering requests were accepted during the month. A solution to the long standing problem of joint sealant in the 100 Areas Retention Basins was offered by a consultant from the Puget Sound Navy Yard. The consultant said that a special Thiokol mixture which was heat stabilized, softer and more easily applied would seal the joints, and he is forwarding a gallon sample for examination and testing. Important projects now in progress include Recuplex, 300 Area Expansion Program, the Fuel Element Pilot Plant, and Reactivation of P-10 Facilities.

Reactor Projects Sub-Section: Work on the 100-C Area Facilities consisted of miscellaneous clean-up and partial completion of the various punch list items. For the 100-K Area Water Plants, concrete and form work was continued in the 181-KE, 165-KW, and 190-KW Buildings. Installation of flash mixers was started in the 183-KW Filter Plant. The fabrication of biological shielding crates for the new Reactors is proceeding at the rate of two per week. There is probability of considerable delay because of slow procurement of process tubing, limonite ore, and thermal shield blocks. The contractor is also having difficulty in leveling the base membrane plates because of extreme variations in temperature.

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Graphite milling began on July 29, more than a month later than originally scheduled. The hardness of this new graphite reduces production through the Sunstrand mills to about 1/3 of that realized in milling of graphite for the 100-C Reactor. There was unsatisfactory progress toward completion of the 2101 Building structure and the installation of equipment.

Separations Projects Sub-Section: The concrete floor pad for 202-A Building was essentially complete. The contractor is completing monolithic structural sections at the rate of two per day. The lump sum portion of the railroad was completed and accepted. Temporary construction for Purex was almost completed. Construction for UO₃ Expansion progressed to 38% complete. Material for the Recuplex Facilities is being prepared for shipment to the fabricator, and the first order for Purex Vessels was placed. For the Redox Capacity Increase, Phase II, architectural engineer design was 48% complete, and G.E. design 46% complete. Design of the Redox Tank Farm, 241-SX, remained at 93%, and overall construction was 4.7% complete.

Project Control Unit continued its routine functions. Unitization of Project CA-431-A and B was completed, and unitization reports were issued on seven other projects. The History group published three histories.

G. MONTHLY REPORT OF INVENTIONS AND DISCOVERIES

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

NONE

July 31, 1953

for
J. S. McMahon, Manager - Projects

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

CA-364 - Aquatic Biology Laboratory

Design was complete, and construction was 70% complete at the end of July. On June 22, 1953 authority was received to construct a circular concrete fish pond with attendant service in 100-F Area. Work began July 13, and is progressing satisfactorily. The project is scheduled to be completed before the established completion date of September 1, 1953.

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CG-551 - Expansion of Building 234-5 Facilities

Design was 10% complete, and scoping is almost complete. The Design Section is preparing a revised project proposal giving additional justification for the Final Inspection Facilities portion of this project and other phases. Detailed design is scheduled for completion about April of 1954. Many of the bulk items of material have been ordered.

ERA-751 - Facilities for Special Pile Measurement

Design was 2% complete. The Pile Technology Sub-Section has requested preparation of a project proposal for building to be located in 105-DR exclusion area. The facility is to be used for experimental studies with radioactive sources, storage for contaminated equipment, and a flux monitoring laboratory. The building is to be about 3,000 square feet of floor area.

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

Specifications for the removal of equipment have been prepared in rough draft form. A copy has been sent to the A.E.C. for review and comments.

ER-2743 - First Cycle Waste Supernatant Cribbing Facilities

Design was 10% complete. The proposed work is to provide open cribs into which supernatant solutions may be pumped from underground waste tanks in both 200-E and 200-W Areas. This method will make available tankage for TBP wastes. The job is estimated at about \$35,000 and is to be performed by Minor Construction.

ERA-3100 - Modifications to 314 Building and Installation of Electro-Plating Pilot Plant

Design was 5% complete. Scoping began July 16, 1953. The proposed work includes clean-up of the 314 Building from Bay 6 west and providing the entire building with service facilities so that it may be used by the Fuel Technology Sub-Section for experimental work. It is also proposed to install a Pilot Plant for study of plating raw uranium slugs and anodizing canned slugs.

ERA-485 - Additional Generator Capacity for Heat Studies - 189-D Building

Design was 10% complete. Approximate cost estimates are being prepared for the several alternative methods of providing additional electric power and current for this facility. Following decision on the type of equipment to be used, a project proposal will be prepared for purchase and installation of this equipment.

2. Final Reporting

CA-497 - New Substation Fences and Grounding of Existing Fences

All work was accepted without exceptions on July 8, 1953. The Physical Completion Notice, PM-2721, was issued on July 24, 1953.

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CG-553 (ERE-484) - Outlet Tube Temperature Monitoring System - High Speed Electric Transcriber for 105-D, DR and F Areas (Flexowriter)

Design had been completed previously, and the project was approved July 13, 1953. The total project cost was estimated at \$43,000, and Manufacturing Department is managing the project.

IR-133 - Water Quality Laboratory, 108-B Building

All field work has been completed and accepted. The Informal Request has been closed out. As-built drawings and unitization are yet to be completed.

ER-6020 - Future Records Storage Study

Design had been completed previously. This study was made to determine the comparative operating costs of maintaining the record center at (1) the present site, (2) both at the present site and in a portion of either the 2101 Building or 271 Building, or (3) the operation of the record center and a portion of either the 2101 Building or the 271 Building, after January 1, 1955. The work also included a study of costs of revisions necessary to the buildings.

3. Current Projects

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

Design had been completed previously; construction for the total project progressed 3% to a total of 92%. Construction on Parts 3 and 4 progressed 18% to a total of 33%. Ventilation work for the fourth floor is essentially complete. Installation of the hoods and fan for ventilation of Room 205 is scheduled to be completed by August 21, 1953. The lump sum work is progressing as scheduled. The second floor concrete slab has been placed.

The continued strike at the General Electric X-Ray Plant is still delaying delivery of the X-Ray machine.

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

Design had been completed previously; construction remained at 99.9% complete. Work Orders have been issued for completion of miscellaneous clean-up work by Minor Construction. This work is progressing satisfactorily.

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

Completion status remained at design 100%, construction 99.8%. Work Orders were issued during the month to Minor Construction for completion of various punch list items and Acceptance Tests. A Work Order was also issued for completion of the Metal Examination Facility.

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CG-431-C - Metal Examination Facility - 105-C

Design progressed 11% to a total of 35%. A revised quotation for the second set of measuring equipment has been received. The estimated cost has increased to \$62,000. All comments on the design criteria have been received and are being incorporated for issue.

CG-438 - Ball Third Safety System

Completion status remained at design 100%, construction 96%. A revised project proposal has been completed for submittal to the A&B meeting during August, 1953. The project proposal requested interim extension of time to January 1, 1954. This extension is necessary to complete the solenoid, circuitry, and area exceptions.

The 100-D Area system had an automatic drop on July 18; however, a thorough check of the system failed to reveal any defect.

CG-482 - Pile and Pile Water Plant Improvements

Completion status remained at design 100%, construction 99%. A revised project proposal is being prepared reducing the total project cost to \$380,000. The total estimated cost to Manufacturing Department expense is \$88,000. The remainder is being charged to engineering expense for cancelled projects. It is expected that part of the commitments, totaling \$97,000, will be eliminated.

CG-496 - Recuplex Installation, 234-5 Building

Design progressed 5% to a total of 95%, construction progressed 9% to a total of 19%. The removal of hoods was completed, and architectural modifications have begun. Material is being prepared for shipment to the fabricator of Recuplex vessels. About 100 of the vessels are to be fabricated in the Los Angeles Area. A revised project proposal is being prepared on the probability that scope may be reduced to confine the work to available funds.

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

Completion status remained at design 100%, construction 99%. A solution to the problem of leakage was proposed by a consultant from the Puget Sound Navy Yard. The consultant said that the Thiokol hardened when compressed over 25% for an extended period. He said that the Navy Yard could supply a Thiokol mixture that would be heat stabilized, softer, and more easily applied. A gallon was sent for examination and testing.

CA-512 - 100-K Area Facilities

100-KW and 100-KE Water Plants

The overall design of Water Plants progressed 5.5% to a total of 90%. Construction progress was as follows: KW progressed 4% to a total of 26%; KE progressed 4% to a total of 18%. General facilities progressed 4.6% to a total of 32%.

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Total concrete placed in the KW Water Area was 52,600 cubic yards, and in KE Water Plant 37,600 cubic yards. Installation of flash mixers has been started in the 183-KW Filter Plant, and other work in the Filter Plants is progressing satisfactorily. Forms are being placed for the operating floor slab of 181-KE pump house, and for equipment foundations and floor slabs in the 165-KW and 190-KW Buildings. Concrete has been placed in portions of the outfall structure and the overflow spillway.

Following settlement of the strike at the Bingham Pump Company, Portland, Oregon, the first of the 30,000 g.p.m. pumps has been accepted, and the other pumps are being manufactured.

105-KW and 105-KE Buildings

Overall design progressed 2% to a total of 94%. Construction progressed as follows: KW progressed 2.2% to a total of 17%; KE progressed 2.3% to a total of 10.7%. Total concrete placed for 105-KW was 19,200 cubic yards, and for 105-KE, 16,400 cubic yards. The cumulative total of structural and miscellaneous steel was 2,020 tons for 105-KW, and 1,330 tons for 105-KE. The exhaust stack was completed to an elevation 200 feet above the foundation. The fabrication of crates for biological shielding has been very satisfactory both as to quality and quantity. The Puget Sound Navy Yard is able to fabricate about three crates per week, and the construction contractor is able to receive about two crates per week. Procurement problems are gradually being resolved for such equipment as thermal shielding and the downcomer approach section. The vendor of process tubes has experienced considerable difficulty and has not yet produced acceptable tubes. The contract for limonite ore for heavy-aggregate concrete has been cancelled because of poor quality.

The contractor has been unable to level the base membrane plates because of extreme variations of temperature between day and night. Other installation is being delayed until temperature control can be maintained.

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

Construction of the building progressed 6.5% to a total of 92%. Both construction of the building and installation of equipment have been slow. On July 29 the A.E.C. requested technical assistance in the balancing of the air supply and exhaust systems in the building.

Pre-shop milling of graphite on a production basis was started on July 29, over five weeks behind schedule. In terms of pieces of graphite, the work is about 44,000 blocks behind the schedule required to insure packing on November 23, 1953. The hardness of this new graphite reduces production through the Sunstrand mills to about 1/3 of that realized in milling of graphite for the 100-C Reactor.

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Construction contractor is still considering the use of 101 Building as a Tube Shop; however, General Electric has continued its recommendation that the "cat shop" at White Bluffs be used.

CA-513-A - Purex Facility

Overall design for Purex progressed 10% to a total of 63%; temporary construction was essentially completed. Overall construction, including lump sum contracts was 5.7% complete. The concrete foundation mat for 202-A was scheduled for completion during early August, and the contractor was completing monolithic structural columns at the rate of two per day. The lump sum contractor for the railroad completed work during July, and that portion of the railroad was accepted by both A.E.C. and General Electric.

It has been decided that concentrators for Purex are to be redesigned, and scope drafting was completed during the month. An order for 30 Purex vessels was placed in the Cleveland Area. On the basis of performance of the 12" prototype centrifuges, the Bird Machine Company is proceeding with redesign and development of the 40" liquid-liquid centrifuges for Purex. There has been considerable discussion with the A.E.C. on the question of vendors for the centrifuges. The Bird Machine Company is the only known manufacturer of remotely maintained liquid-liquid centrifuges; so a non-competitive contract is being considered.

CA-513-B - Uranium Oxide Conversion Facility

Construction is being expedited by all possible means. Completion status increased from 9% to 38%. It is now believed that the established completion date of October 15, 1953 can be met, if deliveries of material and equipment are made as promised.

Progress during the month consisted of placing concrete roof slabs and floor slabs, service facilities, and process wiring. Shop work on the furnace kettle revisions was about 80% complete.

CA-513-C - Purex Prototype 321 Building

Exceptions on the prototype have been cleared, and work has begun on the demineralizer equipment. Construction was about 99% complete.

CA-513-D - Hot Semiworks Conversion

Part "D" was authorized by A.E.C. on July 7, 1953, with \$680,000 for performance of the proposed work. Design funds have been forwarded to Design Section, and detail work has been started. Advance ordering was completed on critical stainless steel items and engineered equipment. The procurement of other items has been delayed about three weeks by local screening of requisitions.

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CA-514 - 300 Area Expansion Program - Production Facilities

The overall scoping had been completed previously; detailed design progressed 18% to a total of 55%; and construction progressed 4% to a total of 7%. The Manufacturing Department has requested an increase in capacity of 300 Area Facilities within the estimated funds for the 300 Area Expansion Program. An estimate is being made to determine if the building with the additional equipment could be constructed within the funds now authorized.

A. Process Facilities

Scoping had been completed previously; detailed design progressed 10% to a total of 49%, construction progressed 12.5% to a total of 15%. The lump sum contractor has completed the railroad spur and is placing concrete in footings and walls. The structural steel contractor is expected to begin preliminary work in early August.

Purchase specifications have been submitted for bids on equipment for the slug pickle, cap and can preparation, sleeve preparation, and furnace area conveyor. The estimated total cost of this equipment is \$140,000. Purchase specifications for the penetration etch equipment have been approved for bid purposes. Estimated total cost for the etch equipment is \$60,000.

B. Acid, Caustic and Methanol Facilities

Scoping had been completed previously; detailed design progressed 15% to a total of 90%. A complete set of comment prints has been received from the architect-engineer, and these prints have been reviewed. Construction is to be performed by a lump sum contractor.

E. Decontamination Station

Scoping had been completed previously; detailed design progressed 35% to a total of 40%. The architect-engineer is preparing the complete design for bidding on the second lump sum contract.

G. Railroad

Both scoping and detailed design had been completed previously. Construction progressed 55% to a total of 70%. The lump sum contractor has started to lay rail.

H. Process Sewer

Completion status remained at scoping 100%, detailed design 100%, construction 90%. Work is awaiting the dredging of the south retention pond by the Metal Preparation Section.

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K. Manufacturing Office Building, Gate House, and Parking Lot

Scoping had been completed previously; detailed design was 30% complete. A preliminary space allocation has been made in the 3706 Building. Space is available to include offices from the previously proposed Administration Building and the 3707-A Building.

Drawings and specifications for the addition to the 2701-L Gate House have been completed except for the mechanical portion. Drawings and specifications for the roads, sidewalks, and parking lot have been completed.

L. Change House Renovations 3707-A and B

Scoping had been completed previously. The offices previously scheduled for 3707-A will be relocated to 3706. The space in 3707-A has not been reassigned.

M. Oil and Paint Storage

Scoping had been completed previously. Design criteria have been issued, and General Electric is to perform the design.

N. Steam and Water Facilities

Scoping had been completed previously, and design was 5% complete. Information is being gathered on load requirements for the buildings to be serviced by the enlarged steam line.

P. Hutment Removal

With scoping complete, no further work has been done.

Q. Fire Alarm System

With scoping complete, no further work has been done.

CG-550 - (ERA-746) - Reactivation of P-10 Facilities

Design progressed 46% to a total of 71%; construction progressed 21% to a total of 33%. Modification #1 of A.E.C. Directive HW-303 was issued July 2, 1953 increasing the funds authorized for this project by \$290,000, to a total of \$440,000. The modification also requested that the project again be revised to include funds for two additional "J" slug shipping casks, thus making a total of four new casks to be built. It is estimated that the proposed revision can be completed for review at the A&B meeting on September 15, 1953.

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B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design completion status remained at 20%, and construction was 1% complete. A Work Order was issued to increase to \$30,900 the funds authorized for improvements to ventilation in the Redox sample galleries. A drawing schedule for General Electric design has been issued in conjunction with CA-535, Redox Capacity Increase - Phase II.

CA-406 - Phase II, Mechanical Development Building

Design had been completed previously. Construction progressed 5% to a total of 90%. Work was stopped on July 16 by a wage dispute involving asbestos workers. In addition, a 350 KVA transformer, which was supplied by the contractor, failed on July 24 on a light load. It was returned to the vendor for repair. Acceptance of the building and start of equipment installation is being correspondingly delayed.

CA-434 - New Bio-Assay Laboratory

Design completion status remained at 90%; construction progressed to 1% complete. Construction was begun on Phase I only, architectural and laboratory equipment. The contractor has proposed to furnish metal laboratory equipment instead of the wood equipment as specified, and the architect-engineer has accepted this proposal. Final design and specifications for Phase II, electrical and mechanical, have not been received.

CA-441 - Solvent Building

Design completion status remained at 25%. The revised project proposal is still awaiting authorization by the A.E.C.

CG-447 - Portable Meteorological Mast

Completion status remained at design 100%, construction 99%. The revised project proposal requesting a time extension to December 31, 1954 has been forwarded to the A.E.C. The additional time is required to purchase the component meter and the data analysis equipment. No change in authorized funds was requested.

CA-455 - Replace Two Elevated Water Tanks in 200-E Area

Design progressed 5% to completion; construction began and progressed 45% complete. Revised design drawings submitted by A.E.C. to General Electric were returned with comments and approval. Demolition of the existing tanks has begun. An extension of time to October 1, 1953 has been authorized.

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CG-477 - Building 284-W - Fifth Boiler Addition

Completion status remained at design 100%, construction 99%. A revised project proposal to allow performance of miscellaneous work by plant forces was prepared and forwarded. This minor work involves only a few thousand dollars.

CA-489 - Neutron Monitoring Calibration Facilities

Design had been completed previously; temporary construction was begun by Minor Construction. The bid opening for construction of the building is scheduled for August 5, 1953.

CG-511 - Completion of Minor Construction Fabricating Shops

Design progressed 5% to a total of 95%; construction progressed 25% to a total of 63%. Construction funds have been released to perform work as now scoped in the project proposal; however, it is probable that extension of scope will be requested.

CA-516 - Gable Butte Railroad

Completion status remained at design 50%, construction 0%. The revised project proposal, with total estimated project cost of \$98,000 was forwarded to the A.E.C. on July 21, 1953.

CA-517 - Fire Protection Buildings, 272 E and W

Completion status remained at design 30%, construction 0%. The project proposal is being revised for installation of a sprinkler system in Building 272-W only.

CG-519 - Replacement of 100-D Reactor Effluent Line

Design progressed 1% to a total of 99%; construction progressed 39% to a total of 67%. Approximately 600 feet of 60" O.D. pipe has been laid; 50% of the rocker arm assemblies have been set; openings over the basin walls had been framed; and the basin wall has been chipped in preparation for placing the transition supports. All rocker arm assemblies have been received, and the two 60" gate valves were shipped from Troy, New York on July 24, 1953.

CG-520 - (ERA-1182) - P-13 Pressure Assembly Removal

Design progressed 30% to a total of 90%; construction began and progressed to 10% complete. A location for the mock-up installation is being sought in 100-H Area, because the 1713-H Warehouse is being used for spare parts.

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CA-525 - Permanent Auxiliary Combined Civil Defense and Plant Disaster Control Center

Design completion status had been completed previously; construction began and progressed to 23%. All phases of construction are proceeding rapidly, and a field engineer has been assigned to assist with the work. The revised project proposal reducing the scope and cost has not been approved by the A.E.C.

CA-527 (ER-2718) - Fire Protection - 200 East and West Spare Parts Warehouse

Completion status remained at design 100%, construction 96%. The lump sum contractor is being delayed by lack of materials. The new lines have been installed but not tested. General Electric plant forces have completed tie-in of new lines.

CA-529 - Personnel Meter Gatehouse Facility Improvements

Completion status remained at design 100%, construction 0%. A letter of justification, with photographs of several area gate houses, has been submitted to the A.E.C.

CA-532 (ER-2737) - Fiscal Year 1954 Water Tank Replacements

Completion status remained at design 20%, construction 0%. The project proposal is now being circulated for approvals so that it may be submitted to the A&B meeting on August 10, 1953.

CA-533 (ERE-479) - Hanford Works Official Telephone Exchange

Completion status remained at scoping 82%, design 12%. Following rejection of bids previously received, the A.E.C. has reopened bidding for this equipment.

CA-535 - Redox Capacity Increase, Phase II

The architect-engineer portion of design progressed 21% to a total of 48%; the General Electric portion progressed 4% to a total of 46%. Procurement was about 1% complete.

CA-536 (ERA-686) - Painting High Tanks - 105-B and 105-F

Design has been completed previously; construction progressed 47% to a total of 99%. The high tanks in 100-D and the south tank in 100-B have been completed and accepted. Only clean-up work remains.

CG-538 (ER-2734) - Install Underground Waste Line Between "S" Area & "U" Area 200-W

Design progressed 3% to a total of 89%; construction progressed 29% to a total of 54%. All trench excavation has been completed. About 3,000 feet of concrete trench and three lines of pipe 2300 feet long have been laid. All cover slabs have been cast, and about 1200 feet of cover slabs with membrane are in place.

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About 800 lineal feet of backfill has been completed. The addition of two condensers to the 241-S tank farm has been approved by A.E.C. The condensers will be altered in the White Bluffs Shop.

CA-539 - Additional Waste Storage for Redox

Design was 93% complete, and the General Electric portion of construction was 40% complete. Overall construction was 4.7% complete. The Design Council has decided that no change in tank design will be required because of the higher specific gravity of content resulting from self-concentration. A revised project proposal requesting 20 tanks was prepared, signed, and submitted to the A&B meeting. However, it is believed that A.E.C. will build only 15 tanks. A letter revision to the project proposal has been sent to the A&B meeting requesting authority to build the tie-line from 241-S to 241-U.

CG-543 (ER-2733) - Replace Sanitary Tile Field 200 West Administration Area

Design progressed 5% to a total of 40%. The revised project proposal is being routed for signatures.

CG-544 (ERA-661) - Central Distribution Headquarters

Design completion status remained at 27%. The project proposal requesting conversion of 212-R Building has been prepared and is being routed for signatures. The Electrical Distribution and Telephone Section has requested delay until completion of the justification study for use of Building 2713-E as a transportation garage. This study is scheduled for completion during August.

CG-545 (ERA-724) - Soil Science Laboratory Facilities

Design progressed 15% to a total of 65%. The design of all engineered items is complete, and material procurement has begun. Construction funds have been released to perform that portion of the work which may be accomplished without design.

CA-546 - (ER-3099) - Fuel Element Pilot Plant

Scoping had been completed previously; detailed design was 10% complete. The architect-engineer has scheduled completion of the first phase of design for August 17, 1953. Other scheduled items are second phase preliminary design, September 28, and second phase completion, November 16, 1953.

CG-549 (ER-2731) - Activate Task I, RMA Line - Building 234-5

Design progressed 7% to a total of 27%; construction progressed 3% to a total of 6%. Detailed design began July 1, 1953. Orders have been placed for stainless steel tubing, stainless steel sheet, and lucite.

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IR-116 - (AEC-P-138) Combined Civil Defense and Plant Disaster Control Center

Design had been completed previously. The A.E.C. Directive for construction of the facility was issued to General Electric on July 8, 1953.

IR-159 - (ER-2742) Improved Ventilation Facilities, 201-C

Design progressed 5% to a total of 40%. The work authority was issued on July 22, 1953, and the work release was issued on July 28, for construction to be done by Minor Construction. Of the total authorized funds of \$17,000, \$1,200 is for Design Engineering.

* * * * *

The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month:

ER A-725 - Particle Problem Animal Exposure Equipment

Design progressed 5% to a total of 10%. A firm scope for Phase I has been received from the customer. This work consists of remodeling and equipping Hutment 1705-F for experimental use. The scope for Phase II cannot be accurately estimated until the results of experiments carried on in the facilities provided in Phase I are known. This is estimated to require a minimum of 1½ to 2 years.

ER A-727 - 313 Building Roof Repair or Replacement

Design completion status remained at 50%. Further work is being suspended until early spring of 1954 so that the project may be coordinated with the addition to the new 313 Building.

ER A-735 - Graphite Hot Shop and Storage Building

Design completion status remained at 15%. The project proposal has been submitted to the A & B meeting.

ER A-736 - Transportation Garage and Facilities 2713-E

Design completion status remained at 10%. A Justification Study is being made.

ER A-741 - Renovation of 3722-A, 3702, and 3703 Buildings

Design completion status remained at 50%. The further use of 3722-A Building is being reviewed, and the scope of work is being reduced to delete the renovation of 3702 and 3703 Buildings which will be painted by plant forces.

ER A-742 - Remodeling First Aid Buildings 100-B, D, and F

Design progressed 1% to a total of 2%. Work on scope and justification has been started.

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ER A-748 - Laboratory Supply Space, 3706 Building

Design completion status remained at 25%. The project proposal is awaiting review of the future use of 3706 Building. The estimated cost of this project is \$42,000, with work to be done by Minor Construction because of expected health and hazardous conditions.

ER A-750 - Metal Stock Storage, Building 3717

Design progressed 25% to a total of 30%. The informal request is being processed for signatures.

ER A-1200 - Heat Transfer Laboratory

Design progressed 10% to a total of 15%. The project proposal was submitted to the A & B meeting on July 27, and it is now having minor revision before being submitted to the A.E.C.

ER A-1201 - X Level Controlling and Recording Equipment

Design completion status remained at 15%. The project proposal was submitted to the A & B meeting on July 27, and it is now having minor revisions before being submitted to the A.E.C.

ER A-1204 - Panellit Gauge Testing Facilities

Neither design nor construction has begun. Tests are scheduled for 105-H during August 1953, to determine the feasibility of testing Panellit gages without providing shut-off valves between the gages and Reactor front face. Scope of work can not be determined until the test is completed.

ER A-1205 - Physical Constants Test Reactor (New Facility for Lattice Testing)

Neither design nor construction has begun. The project proposal has been delayed pending design on the construction of a small prototype reactor. The total project cost for the permanent facility is estimated at \$600,000 including provisions of space for a thermal test reactor.

ER A-3098 - Cobalt 60 Source for Radiation Studies

Design completion status was revised to 50% complete.

ER A-2723 - Steel Handling System - 272-W

Design completion status remained at 20%. Further work was delayed to allow completion of higher priority work.

ER 2739 - Redox Cooling Water Disposal Basin

Design completion status remained at 15%. The project proposal has been revised to separate funds between the A.E.C. and General Electric, and the revision has been submitted to the A.E.C.

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ER 2741 - Conversion of 200-W Laundry to Offices

Neither design nor construction has begun. This work has been delayed to allow start up on higher priority work.

CC-5051 - Complete Automatic Backwash - 183-C Building

Work is complete expect for six exceptions which will be performed during the shut-down of August 4 and 5.

CC-5461 through 5464 - Thermal Insulation at Building 2101-E, 200-E Area

Work was stopped because of walk-out of insulation mechanics.

CC-5495 - Gas Cylinder Storage - 329 Building

Work was completed except for installation of two flame arrestors which have not been delivered.

CC-5601 - Preparatory Work for Installation of 101 Canning Machine - R & D Prototype

Concrete piers have been placed, and work was completed on furnace rails and structural members for the platforms.

CC-5634 - Remote Control System - 181-B Building

Work is progressing satisfactorily.

CC-5743 - Construction of Three Valve Houses and Necessary Tie-ins to 30" Export Water Line

Excavation was started July 22, 1953.

C. RELATED FUNCTIONS

Minor Construction Contract

The A.E.C. has disapproved the sub-contract of Pacific Electric Company with the J. A. Jones Construction Company. However since Pacific Electric has performed work at Hanford during June and July, 1953, it is now planned to negotiate a contract for June 1 through August 31, 1953. Meanwhile, the J. A. Jones Company is negotiating for a different electrical contractor by September 1, 1953.

Inspection, Drafting and Estimating

The workload of inspection functions increased substantially during the month through activation of several major orders for 100-K Area and initial activity on stainless steel materials for the Separations projects. Even with a net increase of five people, the Inspection and Materials Unit was obliged to shift field inspectors to care for orders which were received with no advance notice. Also, the workload was increased by numerous rejections in all classes of materials and equipment.

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The biological shield crates are being produced by the Puget Sound Navy Yard at a good rate, two per week, and acceptable quality. Somewhat slower progress is being made by other vendors on gun barrels, process tubing, thermal shield blocks, and limonite ore. The downcomer approach section is being re-fabricated with acceptable results.

Material for Recuplex vessels is being prepared for shipment to the fabricator in Los Angeles, and the first order for Purex vessels was placed in the Cleveland area. The mile of 30" concrete pipe for Purex has been conditionally accepted, and samples of the Purex stainless steel pipe are being provided by the vendor. A mass spectrometer has been furnished the vendor of pots for P-10.

The following is a resume' of inspection activities during the month:

<u>ITEM</u>	<u>NUMBER</u>
Open requisitions requiring inspection	242
Orders assigned to inspectors	453
New orders received	112
Orders completed	33
Sub-vendors orders assigned to inspectors	25
Total requisitions for Program "X" transmitted	163
Total orders for Program "X" placed - Engineered Equipment	148

At the end of July there had been grand totals of 1476 Program "X" requisitions transmitted, and 1222 Program "X" orders placed for engineered equipment.

Drafting production for the month was 332 new drawings, 18 charts and graphs, and 505 revisions. The Drafting Room average was 6.7 man-days per drawing. Overtime was limited to 208 hours. There was some reassignment of draftsmen in one squad to accommodate a reorganization within the Technical Section. Drafting progress was generally good. Work on CA-512-R was 97.1% complete. The scope drafting for redesign of Purex evaporators was completed during the month.

The Reproduction group produced 771,735 square feet during the twenty working days of July, with 168 overtime hours to provide service on priority jobs. The larger orders processed during July were 24,018 prints for CA-512-R, 7,230 prints for CA-512-W, and 6,102 prints for CA-513.

The Estimating group completed 30 estimates during the month. The completed estimates comprised the following: project proposal - 14, comparative - 3, fair cost - 1, high spot - 5, scope - 4, and miscellaneous - 3.

The Field Surveys group began field work on a topographical map of the proposed new Elementary School area, and established initial horizontal and vertical controls for several A.E.C. contractors. This group completed two Area Monument Layouts, and also performed miscellaneous engineering services throughout the areas.

The Project Control Unit continued its routine functions on administration, budgets, and reports. The Control group completed Unitization Reports on CA-431-A & B, CG-187-E, CA-204, CA-403, CG-454, CG-498, CG-540, and IR-146. The History group published three histories, Redox Test Plant, Design of Pile Area G, and New Technical Center Master Plan, bringing the cumulative total to 100.

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D. CRAFT LABOR

Voluntary termination of construction contractor personnel (Kaiser Engineers and associated contractors) increased from 4.2% in June to 6.4% during July. Percentage of voluntary terminations by employees of J. A. Jones and C.P.F.F. subcontractors held about level at 1.5%. Voluntary terminations by Blaw-Knox employees dropped to 9.4%.

The sheetmetal workers ratified an area agreement applicable to Eastern Washington, Western Idaho, and Northeastern Oregon. This new agreement provides for a wage increase of 5¢ per hour (\$2.65 to \$2.70), and a vacation allowance of 6 $\frac{1}{2}$ ¢ per hour on a six-day week basis. Sheetmetal workers have demanded a similar agreement for Hanford, plus other additional pay for shift work, and for time and one-half for all work performed under SWP conditions. These questions were investigated at Los Alamos, with the disclosure of premium payment ranging from 10% to twice the regular rate. The Hanford contractors have refused these demands for extra pay; so the union representatives have agreed, reluctantly, to offer their membership the contractors' latest proposals.

The Hanford Addendum to the Asbestos Workers Agreement expired July 1, 1953. The Union refused to renew the contract, and also refused to dispatch men except within the terms of their area agreement. The issue remains deadlocked, with no men being dispatched.

The Teamsters' Union has, for several years, been attempting negotiations to obtain isolation pay for bus drivers who haul construction workers to and from the field and also perform their own eight-hour assignments in the field. Such drivers are paid overtime based on their classification and rate for daily work. The teamsters wish to arbitrate, but contractors have resisted this step. The two parties are now exchanging correspondence on the issue.

Both Kaiser Engineers and the Carpenters' Union agreed to Father Robert J. Carmody, Seattle University professor, as arbitrator of the dispute regarding the \$1 per day travel allowance for new employees on the day they process through employment. At a hearing on July 10, 1953, both parties presented their briefs. The arbitrator has since ruled in favor of Kaiser Engineers.

Work stoppages of variable severity continued to delay work throughout the construction program. The five-week dispute between Blaw-Knox and the Plumbers' Union was concluded the week ending July 10, 1953. Settlement was accomplished when Blaw-Knox agreed to reinstate the four previously discharged foremen and to use expeditors in the hauling of piping materials.

Millwrights and machinists employed by Kaiser in the 2101 Building continued their jurisdictional dispute. Early in July the millwrights protested the assignment to machinists of changing cutters on the milling machine. By July 10, the dispute had been temporarily settled by assigning actual performance to millwrights and allowing machinists to stand by the operation. On July 22, the millwrights walked out, and Kaiser supervision sent the machinists home. On July 23, a picket line was established by the millwrights. Nearly all employees of Kaiser Engineers remained off the job. Work was resumed on July 29 on the basis of understandings reached at a meeting in Oakland. A meeting was scheduled for August 3 to settle jurisdictional disputes.

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A jurisdictional dispute between carpenters and sheet metal workers over the installation of metal partitions in the 2101 Building caused a work stoppage by seven sheet metal workers on July 2. The strike spread to include all sheet metal workers on the Kaiser payroll, even though the local union called the strike "wildcat". The stoppage continued until July 8, when the union returned sheet metal workers to the job.

A new facet of labor disputes was revealed Tuesday, July 14, when a bus driver became irritated with the heckling from plumbers who insisted that he was driving too fast. The plumbers accused the driver of hurrying in order to deprive them of overtime beyond the 45 minutes allowed by contract. The driver pulled off the road near 200 East Area and suggested that all passengers who did not like his driving could get out. The entire busload of plumbers unloaded, as did another busload of plumbers who stopped to investigate. The two empty buses proceeded to the parking lot in North Richland. Later, two other buses were dispatched to pick up the stranded plumbers. There was no additional overtime allowed the plumbers.

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HW-28906

RICHLAND, WASHINGTON HANFORD ATOMIC PRODUCTS OPERATION

August 10, 1953

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

JULY, 1953

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SECURITY INFORMATION

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<u>Visitor</u>	<u>Date</u>	<u>Address</u>	<u>Purpose</u>
J. L. Zambrow N. P. Pinto L. Smiley	7-1,2-53	Sylvania Electric Products Co.	To collect information on "S" powder metallurgy slugs

<u>Name</u>	<u>Date</u>	<u>Place Visited</u>	<u>Purpose</u>
F. B. Quinlan	7-1-53	Precision Machine Works	Instrumentation consultation
R. L. Reynolds	7-1,2-53	General Eng. Lab.	Consultation on Underwater Examination Equipment
R. W. Benoliel	7-1,3-53	General Eng. Lab. Battelle Memorial Institute	Consultations on Fuel Element Development Program
W. T. Kattner	7-16,31-53	du Pont Company National Lead of Ohio Mallinckrodt Chemical Works	Metal quality and fabrication techniques discussions
R. W. Benoliel	7-17,25-53	du Pont Company	Metal quality and fabrication techniques discussions
R. S. Dalrymple	7-29-53	Kaiser Aluminum & Chemical Corp.	Discussion of coatings and corrosion problems
R. L. Dillon	7-29-53	Kaiser Aluminum & Chemical Corp.	Discussion of coatings and corrosion problems

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URANIUM QUALITYUranium Reduced from UF₆ Parent Material

Uranium produced from uranium hexafluoride is being critically examined since it will be used for future Hanford fuel. Preliminary pre-irradiation tests indicate that this metal is comparable to production metal with respect to reactivity, grain structure, mechanical properties, orientation, and inclusions. However, it appears to contain more carbon and aluminum and less nitrogen impurities than regular uranium. Irradiation tests of this uranium are being planned.

Uranium Rolling

The pile behavior of slugs from rods rolled in the new mill at Fernald is being investigated under a production test. Approximately 120,000 of the 210,000 eight-inch slugs canned under this test have been sent to the pile areas.

Dimensional stability during irradiation is to be determined on high alpha rolled uranium with a small grain size and near random orientation. Two slugs of this metal showed no grain size change as a result of lead dip canning.

In rolling tests at Fernald, it has been shown that carbon contents from 100 to 1100 parts per million, mill speeds from 266 to 300 feet per minute delivery, and water spray quenching do not cause variations in orientation or grain structure. Mill speeds from 300 - 350 feet per minute delivery may produce large grains in the rod core, but do not alter the orientation.

Studies of Defective Uranium

Heavy striations and porosity of slugs cause poor bonding between cap, Al-Si layer, and compound layer of canned slugs. It appears that there is no bonding at the end of each stringer or pore in the uranium due to the evolution of gas. The striations and porosity in the rejected slugs that were examined apparently resulted from high carbon, nitrogen, and magnesium impurities.

Blowholes in cast uranium which have been closed by rolling appear to open during thermal cycling in the alpha phase.

Transformation and Heat Treatment of Uranium

A slug rejected by ultrasonics as untransformed because of small grain size has upon microscopic examination been found to be transformed. The small size of the transformed grains apparently resulted from high carbon, high aluminum, high iron, and high silicon impurity content.

The pile behavior of lead-dip canned slugs from beta heat treated rods is being studied under a production test. The last of 97,000 slugs for this test were received in July. Quality control studies are being initiated on samples from the heat treated rods.

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All samples of triple-dip canned slugs examined during the past month were transformed.

URANIUM DEVELOPMENT

Fabrication of Uranium

The fine grain size and random orientation of uranium powder metal compact slugs should provide a dimensionally stable uranium fuel core. The pre-irradiation evaluation to determine the uniformity of properties of 5000 uranium compact slugs produced in the Sylvania Pilot Plant at Hicksville is well underway. The nitrogen and iron content of this metal is higher than that of regular production material, while the carbon content and other impurities are essentially equivalent to that of production uranium. Reactivity tests indicate a loss of 50 in-hours for a full pile charge of powder metal compacts.

The use of derbies in place of ingots as a source material offers considerable economic advantage in the production of powder metal compact slugs. Several slugs produced from derby metal have exhibited a reactivity comparable to slugs from ingot source material, while the carbon content of the "derby" slugs was about one twentieth that of standard uranium.

Solid alpha extruded uranium is being studied to determine the suitability of extrusion as a technique for production of hollow fuel elements. Rods were extruded at MIT under various conditions to establish the optimum extrusion condition for the production of sufficient material for a pile test. After salt bath beta heat treatment the alpha extruded uranium exhibited a grain size and a degree of preferred orientation similar to that of salt bath beta heat treated alpha rolled uranium. Twelve hollow billets were cast at the melt plant for use in extrusion of hollow uranium rods at KAPL.

Uranium Alloys

Considerable hot checking was encountered during the rolling at FMPC of the Hanford cast uranium plus 0.32 atomic per cent chromium alloy billets; however, only incomplete information is available on the rolling conditions.

Five slugs of uranium plus 0.4 atomic per cent chromium alloy were discharged at an exposure of 156 MWD/T. Visual examination of this metal shows no apparent effect of irradiation. A second group of five slugs were discharged at 224 MWD/T but have not been examined.

Uranium plus one atomic per cent silicon alloy rolled at 525 C, beta heat treated at 735 C, and water quenched exhibited a uniform grain size approximately one-fifth that of beta heat treated natural uranium. The fine grain size and low calculated reactivity loss for this alloy make it very promising for pile use.

Process Tube and Can Metals

To provide an aluminum can material of greater corrosion resistance, high purity aluminum and high purity aluminum base alloys are being studied. Tensile tests on

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pure aluminum indicate that it has a strength much lower than the present 2S material. However, the aluminum plus 0.25 per cent zirconium and aluminum plus 0.5 per cent magnesium alloys have strength values comparable to that of 2S-H-18 aluminum.

CANNING TECHNIQUES

Vacuum Canning

Techniques of canning in a vacuum were further developed by experimental work of laboratory scale. Improved outgassing of components eliminated previously observed unwet areas on the uranium. First trials of canning with ceramic end-cap insulators and canning of one uranium piece over-size in diameter by 0.014 inches were satisfactorily done without difficulty.

The vacuum canning method also should be readily applicable for bonding with alloys, including Al-Si with toxic beryllium or costly germanium which are not feasible in the present manufacturing process, for manufacture of internally and externally cooled hollow slugs, and for use of sweated coated components, e.g., nickel plated cans.

Equipment is being prepared to can larger quantities of slugs for destructive and non-destructive testing.

Tru-Line Slugs

Approximately 2,000 slugs were canned with Tru-line cans and well-type, Tru-line caps. Four tube charges were made in the F Pile on July 17. The remainder are scheduled to be charged in C and F Piles during August. Canning of an additional 10,000 slugs will proceed upon delivery of additional Tru-line cans and caps from ALCCA.

Mechanized Canning

Four canning runs each producing sixty to eighty canned slugs were made with only minor mechanical difficulties. The average yield from the machine was 85 per cent. These slugs show promise that thin braze lines and less can wall penetration can be uniformly obtained.

Improved "C" Type Slug Canning

About 640 J slug rejects (marred surface and under-size diameter) were successfully drawn to a nominal 1.350" diameter and straightened. The canning of this material and 16 kilograms of U²³⁵ in new alloy slugs is scheduled to start about August 1. The slugs will be canned by cold sizing and welding of Al-Si brazed cap. The material will be charged in the DR-10 program as needed.

Receptacle Slug Canning

Receptacle slug canning has been simplified by the use of an improved receptacle slug can. Twenty-four slugs were canned with higher yield and a decrease in machine and labor time per slug.

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DECLASSIFIEDCanning of Axially Drilled Slugs

An investigation is proceeding of the possibility of reduction of non-seating and can wall penetration by canning with uranium slugs having a small diameter axial hole which would divert some of the Al-Si flow from the annulus on insertion of the uranium into the can. Four such pieces were canned satisfactorily. Canning and quality tests will proceed using fifty-six additional uranium slugs.

Canning in Al-Si Clad Can

One dummy "C" slug was canned in an Al-Si clad can and destructively examined as a preliminary check of a possible canning technique. The can adhered firmly to the slug. Bonding of the cap to the can was slight. Further tests are planned.

Uranium Surface Cleaning

Investigations are proceeding on improvement on the wettability of uranium in Al-Si by protection of the cleaned uranium surface with a chemically deposited metallic coating. Complete wetting was obtained with tin. Other metals used less successfully as coatings were copper, lead, silver, and zinc. More data will be required for full interpretation of results.

FABRICATION TECHNIQUESHot Press Canning Program

Calculation of the residual can wall thickness resulting from the hot press operation gives a figure of 22 to 26 mils. This agrees well with the experimental values of 22 to 25 mils.

Several slug caps and cans containing alumina ceramic discs were used in preliminary Al-Si canning tests. Some can deformation resulted from pressure welding the disc in the can end. For satisfactory use of the ceramic discs, this will have to be overcome.

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Cold Press Canning Program

Since the value of a mechanically bonded slug is dependent on the integrity of the closure, efforts were made to improve the closure by relocating its position and hot pressing the resulting weld. Five slugs with known weld defects were hot pressed with the result that two of them passed the radiograph test. It was found that hot pressing the ends did not disturb the mechanical keying on the remainder of the slug.

Fabrication of Components

In view of the costs and time involved in obtaining small numbers of experimental can components, either by purchase from outside vendors or by plant fabrication, several different small scale fabrication techniques are being investigated. Deep draw and Uniscan operations were tried with encouraging results.

TESTINGAl-Si Penetration

The MIZ-1 penetration detector was used to test 50 canned reject slugs at a rate of about one slug every 12 seconds. One suspicious slug was detected. This slug proved to have a small penetration within 20 mils of the can wall about two and one-half inches from the cap. No other penetrations within 20 mils of the can wall were observed, either with the equipment or by caustic stripping. Components have now arrived for making map-like diagrams of the penetration readings for comparison with the actual stripped surface, and progressively larger numbers of slugs will be tested during the coming month.

Unbond Test

Crystal manipulators for the unbond test have arrived and work has begun to adapt this test for trial in the 313 Building and comparison with the frost test. Electronic and slug handling equipment for the unbond test is essentially the same as that being used for the ultrasonic transformation test. This equipment is already in use on the production test, "Lead-Dip Canning and Irradiation of Uranium Slugs Machined from the Salt Bath Heat Treated Fernald Rolled Rod."

Ultrasonic Transformation Test

Two Sonizon test units arranged for measurement of the grain size by ultrasonic transmission are now on the production line in 313. At month end, approximately 20,000 pieces will have been tested. Minor breakdowns have occurred and will probably continue but no major trouble with the operating principles or with the electronic equipment has been observed. An unexpectedly large number of rejects, some of which are borderline cases and some actually partially transformed, have been found. The Uranium Quality Sub-Unit is making a detailed investigation.

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DECLASSIFIEDCompound Layer Stress Corrosion

Data obtained from destructive tests indicates that stress relief of the can wall after canning definitely improves the corrosion resistance of the compound layers as indicated by the water autoclave test. Stress relief was effected by peening the surface in this study, but preliminary indications that low temperature annealing also accomplishes this result have been obtained. The tests for quality evaluation have been reduced to a standard sequence and good qualitative results are being obtained in respect to several important properties of the slug.

COATINGS AND CORROSIONFlow Cup Laboratory

The equipment for addition of dichromate has been installed and is in operation. The instrumentation of the laboratory makes possible a graphic demonstration of the effect of dichromate on the galvanic current of the zirconium-aluminum couple. The current is decreased by a factor of from three to ten, and the lasting effect of the film is dependent upon the time of exposure of the samples to the dichromate.

Corrosion Studies

An H-metal slug with holes drilled through the jacket to the aluminum-uranium alloy was exposed in an autoclave to water at 135 C for 96 hours. At the end of this time there was no evidence of corrosion on the alloy slug or on the jacket.

Comparative tests have shown that a chromic-phosphoric acid solution is superior to an oxalic acid solution for cleaning aluminum-jacketed slugs prior to examination. There is less weight loss and less change in surface appearance if the former solution is used.

Corrosion tests have demonstrated the type of attack expected when aluminum contaminated with graphite is exposed to water at 20, 40, 60, and 90 C. At the lower temperatures pitting occurs, and at the higher temperatures the attack is predominantly generalized corrosion.

Coating Studies

Equipment for electroplating four- or eight-inch slugs has been ordered in preparation for semi-pilot plant operation next month. With this equipment, about ten full-size slugs can be plated each day.

Nickel-coated cans were used under varying conditions to fabricate ten eight-inch fuel elements using the lead-dip technique. In these tests a temperature of 610-620 C was necessary. A zinc undercoating was unsatisfactory because a low melting ternary alloy was formed.

An extraction line to determine the gas content of uranium is in operation. This line will also be used to determine the gas content of the electroplate or other coatings on slugs. The preliminary results are in good agreement; the average gas content of alpha-rolled, beta-heat treated uranium is 0.7 cc gas/cc uranium.

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Fuel Technology Sub-Section

HW-28906

Some zirconium samples have been anodized in a bath containing sulfuric and nitric acids. A moderately hard and adherent dark gray coating, having a thickness of from 0.0005 to 0.001 inches, was obtained.

FUEL EXAMINATION

Slug Examination

Weight losses of slugs after exposure in 7.2 pH alum coagulated water have been obtained. The jackets of these slugs appeared sound and no adverse effects were observed at 240 MWD/T exposure.

The first 600 MWD/T exposed corrosion study slugs at C Pile were weighed and the weight differences have been obtained. Surface temperatures will be available upon completion of the weaseling data.

Welds on slugs after 376 MWD/T exposure appeared to be sound. These slugs were from tube 2175-C of the production test on "Local Controlled Increase in C Pile Tube Powers." As noted previously, there was a slight degree of active pitting on the bevel edges of a few of these slugs.

Weight loss data was made available on slugs from tubes which were subjected to ferrifloc without dichromate treated water.

An eight-inch slug ruptured in C Pile and upon discharge it was found to be in two pieces. Uranium cleavage was indicated from a line of depression in the jacket which extended from the fracture along the longitudinal axis of the slug.

While operating at approximately 800 MW, a four-inch slug ruptured in H Pile. This was a sizable side failure near the cap end; however, there was no evidence to indicate that the failure was related to the weld.

Slug Examination Facilities

Minor Construction forces started the necessary work to complete the 100-C Slug Examination Facility and it is estimated that from four to six weeks will be required for completion.

The prototype slug handling dolly and slug measurer for use in C Basin are being shipped from GEL.

Preliminary layouts of the mechanical equipment to be fabricated by plant forces for the 100-C Slug Examination Facility have been drawn up by the Power and Mechanical Design Unit.

The only piece of equipment necessary for the operation of the 105-B facility which has not been installed is the Slug Cleaner. Heating element failure, upon preliminary tests, required revision to this piece of equipment.

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DECLASSIFIEDLABORATORY ENGINEERINGLaboratory Equipment Development

Arrangements were made for the dissolution of this organization effective August 1, with the assigned personnel being transferred to the four Sub-Sections of the Technical Section based on the percentage of the past years expended effort. This change makes the personnel an integral part of the Sub-Section organization and will permit closer control of the expenditure pattern for this type of work.

Equipment developed for laboratory use in connection with 100-300 Area process development included: a process tube cleaning tank; an optical comparator support and manipulator; and an underwater lighting fixture.

Equipment developed for 200 Area laboratory use included the remote recovery unit, a screw lift pump and an "in-cell" transfer station.

Buildings and Grounds

Progress on those buildings presently under construction in the Laboratory Area continued to be slow. The Radiometallurgy Building was accepted from the contractor with minor exceptions, on June 29, 1953. The completion date for the Mechanical Development Building, most recently scheduled for August 1, was again revised when the transformer was found to be faulty. The estimated completion date for the Radiochemistry Building was revised to November 15, 1953, and for the Pile Research and Development Building to November 1. In the latter building air balancing is to be done after completion.

Boullion and Griffith of Seattle, Washington, was given notice to proceed on the design of the Fuel Element Pilot Plant Project CA-546.

Operating landlord responsibility for each 300 Area building occupied by Technical was delegated to the Sub-Section occupying the major portion of the building. Work Orders covering renovation or repair of buildings will be monitored by Laboratory Engineering.

INVENTIONS

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

INVENTOR
H. L. Libby

TITLE
AN APPARATUS FOR MEASURING THICKNESS OF METALLIC COATINGS & DETECTING SUB-SURFACE DEFECTS IN METALLIC OBJECTS - The art of non-destructive testing of metals or metallic objects or objects with metallic coatings by inductive electrical

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INVENTOR (continued)
H. L. Libby

TITLE
method for (1) measuring the thickness of the outer coating of an object coated with one or more layers of electrically conducting material, (2) detecting sub-surface defects in metallic surfaces, and (3) measuring the electrical characteristics of metallic surfaces.

E. A. Smith &
E. A. Evans

A METHOD OF COATING URANIUM WITH ALUMINUM BY AL-SI BONDING IN A VACUUM - Novel features of this process include: (1) outgassing all components and bonding medium in vacuo, (2) assembling components cold in final spatial relationship, (3) heating components in vacuo to alloying temperature, and (4) addition of metered amount of bonding medium to fill interstitial spaces between components.

GEMcC:acj
Manager, Fuel Technology
ENGINEERING DEPARTMENT

GEMcC:acj

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MEDICAL DEPARTMENT

JULY 1953

General

Personnel Changes

The roll decreased from 254 to 248.

Visits

Dr. Fuqua and Dr. Scudder took a one week refresher course in Psychiatry at the University of Washington Medical School in Seattle.

Miss Albright attended a meeting of the board of directors of the Washington State Nurses Association in Seattle.

Dr. Sachs attended an executive board meeting of the Washington Public Health Association in Seattle.

Miss Dunning attended a supervisors meeting in Spokane sponsored by the State Department of Health.

Miss M. Estabrook and Miss C. Vavra visited the Public Health section in regard to the program of teacher observation in local health departments.

Messrs. B. M. McLean and O. Schnellhardt of the Corps of Engineers of Walla Walla consulted with the Public Health officer regarding the back waters of McNary Dam and the effect on the mosquito control problem.

Mr. W. Fitch and Mr. C. Laurence, hearing and speech consultants of the State Department of Health, met with Public Health representatives to review the conservation of hearing program for Richland.

Miss J. Stein and Miss M. Marshall, nutrition and dental consultants of the State Department of Health, visited in connection with the pre-school physical examinations to be held in August.

Miss J. Anderson, Field Advisor of the University of Washington, visited in regard to our student nurse field training program.

Dr. Brown of the University of Pennsylvania Medical School, visited our Bacteriology section to discuss mutual problems.

Mr. Shackleford, a procedures analyst, visited us in connection with his assignment to try to effect improvement and uniformity in company medical records.

Employee Relations

Employee attendance at 26 meetings was 208.

Industrial Medicine

Employee physical examinations decreased from 1238 to 1044. One major and one sub-major injury were sustained by General Electric employees. Contractor employees sustained no major or sub-major injuries.

The health topic of the month "Speak Up" stresses the importance of communications in maintaining the proper mental attitude so important to the health and efficiency of the employee.

Sickness absenteeism was 1.17% as compared with 1.51% in June while total absenteeism was 1.72% as compared with 2.23% in June.

Kadlec Hospital

The average daily adult census decreased from 74 to 72.4. This represented an occupancy percentage of 68.1 on the mixed services.

Plans are under way for the A.E.C. to secure a group of consultants to advise us as to such things as timing of the conversion of the hospital to management other than General Electric and the best form of such management. The group will also be asked to consider such items as need for additional beds for the hospital and other related hospital, and possibly industrial medical and public health problems.

MEDICAL DEPARTMENT

JULY 1953

General (Continued)

Public Health & Welfare

The incidence of communicable disease was much lower with twenty-five cases of measles showing the highest incidence.

Prevalence of mosquitoes increased due to excessive flooding of land outside of our control area.

The social service counselors had an unusually high incidence of cases requiring financial assistance.

Costs - June

Medical Department costs before assessments to other departments were as follows:

	May	June	June Budget
Industrial Medicine (Oper.)	\$41,016	\$45,769	\$41,085
Public Health (Oper.)	10,147	14,372	14,839
Kadlec Hospital (Net)	28,067	37,947	33,008
Hospital Expense Credits	4,611	5,432	3,332
Sub-total-Medical Department (Oper.)	83,841	103,520	92,264
Construction Medical (Industrial and Public Health)	2,614	1,807	12,604
Total-Operations and Construction	\$86,455	\$105,327	\$104,868

The net cost of operating the Medical Department before charges were assessed to other departments was \$105,327, an increase of \$18,872 and \$459 above the budget figure. Revenue was decreased due to the lower census while expenses were increased due to keeping the books open a longer time to complete the fiscal year and increased maintenance costs in the hospital and public health.

Fiscal Year Costs

The net cost was \$900,366 as compared to a budget figure of \$1,033,300 and the figures are best explained by examining individual sections.

Kadlec Hospital net cost for the year was \$252,941 as compared with \$288,307 for FY 1952 and a budget figure of \$315,000.

With patient days totaling about the same and average employees down by one, and salaries increased during the year, the improved net cost was largely due to increased hospital rates effective during the latter six months of the year.

Public Health and Welfare net cost was \$135,849 as compared to \$127,890 for FY 1952 and a budget figure of \$143,360.

Industrial Medical-Operations FY 1953 net costs were \$404,677 which was 94.9% of the budget and \$38,977 above FY 1952 net costs. The increased cost was due to increases in salaries to employees and staffing more nearly in line with the budgeted requirements.

MEDICAL DEPARTMENT

JULY 1953

Industrial Medical Section

The number of medical examinations decreased from 1238 to 1044. General Electric employees sustained 1 major injury and 1 sub-major injury. Contractor employees sustained no major or sub-major injuries. Dispensary visits increased from 4271 in June to 4605 in July. A new dispensary in the 700 Area was opened on July 13th. To date the volume of patients seen in this station has not been large and continued operation will depend on patient volume.

One information meeting was held during the month for industrial physicians.

Two industrial physicians attended a post-graduate refresher course at the University of Washington Medical School in Seattle during the month.

The Chemical Hazards Committee meeting was held on July 23rd. A summary of the industrial noise study was presented. Protection devices were discussed. A frequency bond analyzer was procured and will further refine noise evaluation. The current physical expansion of 313 Building was discussed from the aspect of environmental controls and a test setup of heli-arc welding in D Area was described.

Mr. Shackleford, a procedures analyst from the New York office, was a visitor for three days reviewing our medical record procedure. This was one of a number of visits to General Electric plants for the purpose of effecting some company wide uniformity in medical record procedure.

The Health Activities Committee met on July 16th and the health topic "Speak Up" was presented. This topic dealt with interpersonal relationship communication problems. Material on this subject was prepared for distribution throughout the plant. The sickness absenteeism for July was 1.17% as compared to 1.51% in June.

Gross costs for June totaled \$37,405 as compared to \$36,116 in May, an increase of \$1,289. This was due to additional maintenance work and keeping the records open for a longer period in order that all costs affecting FY 1953 could be booked.

<u>Costs-Operations</u>	<u>June</u>	<u>May</u>	<u>Increase (Decrease)</u>
Salaries	\$30,890	\$30,500	\$ 390
Continuity of Service	3,088	3,050	38
Laundry	287	299	(12)
Utilities, Transportation, Maintenance	5,963	3,944	2,019
Supplies and Other	6,575	4,369	2,206
Total Gross Costs	46,803	42,162	4,641
Less: Revenue	1,034	1,146	(112)
Expense Credits	8,364	4,900	3,464
Net Cost of Operation	\$37,405	\$36,116	\$1,289

Actual net costs for fiscal year 1953 totaled \$404,677 with a budget of \$426,480 or 94.9%.

MEDICAL DEPARTMENT

JULY 1953

Industrial Medical Section (Continued)

Costs-Construction

Gross costs in June were \$648 as compared to \$1,659 during May, a decrease of \$1,011 due to the fact that now there are just two clerical people on the roll who are preparing records for storage. Details of the costs are as follows:

	June	May	Increase (Decrease)
Salaries	\$ 535	\$1,435	\$ (900)
Continuity of Service	53	143	(90)
Utilities, Transportation, Maintenance	0	0	0
Supplies and Other	60	81	(21)
Total Gross Costs	\$ 648	\$1,659	\$ (1,011)

MEDICAL DEPARTMENT

JULY 1953

<u>Industrial Medical Section (Continued)</u>	<u>June</u>	<u>July</u>	<u>Year to Date</u>
<u>Physical Examinations</u>			
<u>Operations</u>			
Pre-employment	159	101	606
Rehire	31	11	136
Annual	405	268	2418
Interim	273	240	1374
A.E.C.	57	24	228
Re-examination and rechecks	127	224	1001
Termination	116	106	785
Sub-total	1168	974	6548
 <u>Contractors</u>			
Annual	11	25	36
Pre-employment	25	7	697
Rehire	0	0	121
Recheck	9	5	206
Termination and Transfer	25	33	811
Interim	0	0	87
Sub-total	70	70	1958
 Total Physical Examinations	 1238	 1044	 8506
 <u>Laboratory Examinations</u>			
<u>Clinical Laboratory</u>			
Government	255	110	1035
Pre-employment, Termination, Transfer	2986	2322	20238
Annual	2750	1902	15360
Recheck (Area)	1263	1203	7816
First Aid	5	15	55
Clinic	379	258	2902
Hospital	4343	4281	35391
Public Health	18	1	71
Total	11999	10092	82868
 <u>X-Ray</u>			
Government	45	22	177
Pre-employment, Termination, Transfer	255	161	1688
Annual	685	500	3132
First Aid	76	118	732
Clinic	181	188	1536
Hospital	289	310	2565
Public Health	3	7	42
Total	1534	1306	9872
 <u>Electrocardiographs</u>			
Industrial	66	82	362
Clinic	0	2	17
Hospital	49	41	365
Total	115	125	744

MEDICAL DEPARTMENT

JULY 1953

<u>Industrial Medical Section (Continued)</u>	<u>June</u>	<u>July</u>	<u>Year to Date</u>
<u>First Aid Treatments</u>			
<u>Operations</u>			
New Occupational Cases	372	395	2570
Occupational Case Retreatments	1217	1259	8805
Non-occupational Treatments	2305	2608	18699
Sub-total	3894	4262	30074
<u>Construction</u>			
New Occupational Cases	71	91	993
Occupational Case Retreatments	192	194	3040
Non-occupational Treatments	62	28	944
Sub-total	325	313	4977
Facility Operators	52	30	292
Total First Aid Treatments	4271	4605	35343
<u>Major Injuries</u>			
General Electric	1	1	6
Contractors	0	0	2
Total	1	1	8
<u>Sub-major Injuries</u>			
General Electric	0	1	9
Contractors	0	0	11
Total	0	1	20
<u>Absenteeism Investigation</u>			
Calls Made	3	10	48
Employee Personal Illness	2	9	40
No. absent due to illness in family	0	0	1
No. not at home when call was made	1	1	6

MEDICAL DEPARTMENT

JULY 1953

Hospital Section

The average daily adult census decreased from 74.0 to 72.4, as compared to 73.8 a year ago. This represents an occupancy percentage of 66.4, broken down as follows: Mixed Service (Medical, Surgical, and Pediatrics) 68.1; Obstetrical Service 59.5. The minimum and maximum daily census ranged as follows:

	<u>Minimum</u>	<u>Maximum</u>
Mixed Service	35	80
Obstetrical Service	8	19
Total Adult	43	92

The average daily newborn census decreased from 13.2 to 12.2 as compared to 15.1 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.44
Obstetrical	4.25
Newborn	2.95

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of June was 2.26. When newborn infants are included, the ratio is 1.92.

The net expense for the operation of Kadlec Hospital for June was \$37,947, as compared to \$28,067 for May. Summary is as follows:

Kadlec Hospital net expense	\$37,947
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This is an increase of \$9,880 due to an increase of \$4,119 in gross costs and a reduction of \$5,761 in revenue. Gross costs increased as a result of keeping the books open for a longer period than usual so all costs for the fiscal year could be recorded, and also as a result of certain extensive maintenance items which were completed and charged for in June. Revenue decreased due to the drop in patient census which is a normal occurrence during the summer season.

There were a total of seventeen employee relations meetings held during the month with an attendance of 158.

Miss Myrtle Albright, R.N., attended a meeting of the Board of Directors of the Washington State Nurses Association in Seattle.

MEDICAL DEPARTMENT

JULY 1953

Hospital Section (Continued)	June	July	Year to Date
<u>Kadlec Hospital</u>			
Average Daily Adult Census	74.0	72.4	88.3
Medical	19.8	20.5	26.6
Surgical	29.5	30.0	34.2
Pediatrics	10.8	9.4	14.4
Mixed	60.2	59.9	75.2
Obstetrical	13.8	12.5	13.0
Average Daily Newborn Census	13.2	12.2	12.5
Maximum Daily Census:			
Mixed Services	70	80	108
Obstetrical	20	19	23
Total Adult Census	85	92	120
Minimum Daily Census:			
Mixed Services	42	35	35
Obstetrical Service	8	8	6
Total Adult Census	61	43	43
Admissions: Adults	527	517	4192
Discharges: Adults	519	520	4179
Newborn	88	81	552
Patient Days: Adult	2219	2245	18709
Newborn	395	378	2647
Total	2614	2623	21356
Average Length of Stay: Adults	4.3	4.3	4.5
Medical	4.2	3.7	4.4
Surgical	4.4	5.2	4.7
Pediatrics	4.2	3.8	4.3
Mixed	4.3	4.4	4.5
Obstetrical	4.3	4.1	4.4
Newborn	4.5	4.7	4.8
Occupancy Percentage: Adults	67.9	66.4	81.0
Medical	53.5	55.4	71.9
Surgical	92.2	93.8	106.9
Pediatrics	56.8	49.5	75.8
Mixed	68.4	68.1	85.5
Obstetrical	65.7	59.5	61.9
Newborn	50.8	46.9	48.1
(Occupancy Percentage based on 109 adult beds and 26 bassinets.)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.44		
Obstetrics	4.25		
Newborn	2.95		
Avg. No. Employees per Patient (excluding newborn)	2.26		
Operations: Major	88	88	686
Minor	78	117	682
E.E.N.T.	54	34	446
Dental	1	1	4

MEDICAL DEPARTMENT

JULY 1953

Hospital Section (Continued)	June	July	Year to Date
<u>Kadlec Hospital (Continued)</u>			
Births: Live	95	75	551
Still	0	2	9
Deaths	6	3	32
Hospital Net Death Rate	.16%	.17%	.17%
Net Autopsy Rate	16.7	33.3	28.1
Discharged against advice	0	1	4
One Day Cases	134	129	1042
Admission Sources:			
Richland	76.3	73.7	77.0
North Richland	12.1	13.7	10.4
Other	11.6	12.6	12.6
Admissions by Employment:			
General Electric	70.5	69.8	73.4
Government	2.6	3.9	2.7
Facility	4.7	5.4	4.0
Contractors	15.4	14.9	12.1
Schools	1.3	1.7	1.9
Military	.6	.0	.5
Others	4.9	4.3	5.4
Hospital Outpatients Treated	509	529	3308
Physical Therapy Treatments			
Clinic	235	191	1949
Hospital	104	83	1173
Industrial: Plant	254	358	1947
Personal	5	11	60
Total	598	643	5129
Pharmacy			
No. of Prescriptions Filled	2443	2481	20084
No. of Store Orders Filled	528	510	3747
Patient Meals			
Regulars	3381	3655	27854
Children under 8	309	257	3575
Specials	1086	1262	10497
Lights	0	0	5
Softs	997	776	7436
Tonsils	90	49	842
Liquids	201	148	1584
Surgical Liquids	192	104	790
Total	6256	6251	52583
Cafeteria Meals			
Noon	1867	1997	13555
Night	291	350	2072
Total	2158	2347	15627

MEDICAL DEPARTMENT

JULY 1953

Public Health Section

There was a significant drop in the communicable diseases that were reported. However, red measles and chickenpox are the chief offenders. A small endemic area of whooping cough was found in North Richland. Investigation revealed this disease was introduced into the community by residents who recently moved into the area. We are attempting to control this disease by stressing immunization.

Miss Marjorie Eastabrooks, Health Educator, Office of Public Instruction, and Miss Catherine Vavra, Assistant Professor of Public Health of the University of Washington, visited the section in regard to the program of teacher observation in local health departments. After an interview with the student, examination was made for university credit.

Messrs. B. M. McLean and Otto Schnellhardt, of the Corp of Army Engineers of Walla Walla, consulted with us regarding the back waters of the McNary Dam and how it will affect our mosquito control program.

Mr. Waring Fitch and Mr. Clifford Laurence, hearing and speech consultants of the State Department of Health, met with department representatives to review the Conservation of Hearing program for Richland. Tentatively, it was planned that a health department person will do the screening for hearing difficulties; the puretone audiometric check will be made by public health nurses. Investigation was started to see if the Department of Public Instruction would reimburse the local school district to carry on this phase of the program.

Miss June Stein and Miss Mary Marshall, nutritional and dental consultants of the State Department of Health, visited this department to review plans for the pre-school roundup to be held next month.

Miss Julia Anderson, Field Advisor of the University of Washington, made a routine visit to the department in regard to the student nurse field training program.

Miss M. M. Dunning, Supervisor, attended a supervisors' meeting in Spokane, sponsored by the State Department of Health.

The Health Officer attended an executive board meeting of the Washington Public Health Association in Seattle.

Results of regular monthly inspection of food handling establishments indicated most to be operating satisfactorily. Two restaurants were warned of degrading unless improvement is shown. Most violations were on improper cleaning of equipment. Swab rinse tests and sanitary inspections of taverns and cocktail bars indicated these establishments are not doing a satisfactory job of cleaning and sanitizing glassware. Proper methods were demonstrated and a followup will be made. Kitchen plans for a new feeding facility were inspected and approved.

MEDICAL DEPARTMENT

JULY 1953

Public Health Section (Continued)

Uptown shopping area continues to be a problem insofar as trash disposal is concerned. Elimination of Saturday pickup aggravates the situation. This is conducive to the establishment of rat and vermin harborage.

Bacteriological analysis of milk samples were satisfactory with the exception of one distributor. Samples of their products are being picked up on a weekly basis and improvement is being shown.

Forty grade A dairy farms were inspected. Two were degraded because of continued high bacteria counts.

Incidence of dog bites has decreased due to the quarantine being placed on dogs.

Prevalence of adult mosquitoes greatly increased despite the fact that the mosquito control crew sprayed 1360 gallons of larvicide. Aedes dorsalis was the major offender. Since this is a flood water variety, it is our feeling that they are breeding in an uncontrolled area across the river where the pasture land is irrigated by flooding. The residential areas will be sprayed with a residual insecticide to help alleviate the situation. A more potent fogging mixture will also be used in our operations. Excessive watering of compounds, lawns, and horse pastures continues to be a problem.

Water and sewage samples were satisfactory.

The counselors found that there was an unusual upward trend in cases involving economic need. Four families applied with situations involving medical economic problems. Two new cases involved the families' economic situation alone. The assistance needed was planned with each of these families. Five of the families, because of their size, income, and large medical expenses were given outright grants. In one situation, assistance was set up on a loan basis to be refunded at a later date.

Financial assistance was issued also to six families which were currently active cases. Of these six assistance cases, one was for a campship, one was for substitute foster care of a child and four involved medical economic problems. In all six families, past medical expenses created the financial need.

MEDICAL DEPARTMENT

JULY 1953

Public Health Section (Continued)	June	July	Year to Date
<u>Education</u>			
Pamphlets distributed	12,008	10,989	75,944
News Releases	5	6	76
Staff Meetings	2	1	10
Classes	7	12	71
Attendance	47	39	547
Lectures & Talks	4	5	84
Attendance	101	76	3,349
Films Shown	9	12	148
Attendance	256	225	4,379
Community Conferences & Meetings	27	17	280
Radio Broadcasts	0	0	9
<u>Immunizations</u>			
Diphtheria	5	0	86
Diphtheria Booster	4	1	336
Tetanus	5	0	142
Tetanus Booster	5	1	438
Pertussis	5	0	18
Pertussis Booster	4	1	139
Smallpox	1	0	88
Smallpox Revaccination	2	2	774
Tuberculin Test	32	17	99
Typhoid Booster	0	1	1
Immune Globulin	17	8	39
Other	0	0	50
<u>Social Service</u>			
Cases carried over	89	87	590
Cases admitted	13	20	105
Cases closed	15	18	94
Remaining case load	87	89	601
Activities:			
Home Visits	12	27	87
Office Interviews	321	298	2,117
Conferences	57	58	367
Meetings	8	6	50
<u>Sanitation</u>			
Inspections made	188	236	1,112
Conferences held	22	12	145
<u>Bacteriological Laboratory</u>			
Treated Water Samples	233	244	1,480
Milk Samples (Inc. cream & ice cream)	40	38	278
Other bacteriological tests	382	430	3,486
Total	655	712	5,244

MEDICAL DEPARTMENT

JULY 1953

Public Health Section (Continued)	June	July	Year to Date
<u>Communicable Diseases</u>			
Chickenpox	28	16	233
Diphtheria	0	1	2
Erysipelas	0	0	1
Food Poisoning	0	0	29
German Measles	12	11	57
Gonorrhea	17	7	68
Impetigo	0	1	7
Influenza (U.R.I.)	0	0	4
Measles	33	28	69
Mumps	20	6	284
Pinkeye	1	0	9
Polioomyelitis	0	1	2
Ringworm	0	0	6
Roseola	0	0	1
Salmonellosis	0	0	4
Scabies	0	0	1
Scarlet Fever	7	0	54
Syphilis	5	0	13
Tuberculosis	1	0	5
Whooping Cough	0	10	10
Total	124	81	859
Total No. Nursing Field Visits	738	595	5,313
Total No. Nursing Office Visits	46	37	576

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Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

JULY 1953

Summary

Eighteen informal radiation incidents, six Class I, and four Class II incidents, were recorded. The Class II incidents mainly represented cases well outside the conventional limits, three of them referring to exposures above 10 rep. One incident attracted press attention following contamination of a Richland dormitory.

Excessive releases of radiiodine from the Redox plant continued.

Perplexing concentrations of radioactive particles over the measured portion of the Pacific Northwest persisted throughout the month.

In research activities, progress was made in the selection of appropriate therapy for plutonium.

Northeastward movement of ground water below the 200-W Area was conclusively demonstrated. This has a significant bearing on waste disposal practices.

Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

JULY 1953

Organization

The month end force of 364 included 31 supervisors, 102 engineers and scientists, 17 clerical, and 214 other personnel.

Number of Employees on Payroll

Beginning of month	-	368
End of month	-	<u>364</u>
Net decrease	-	4

General

The number of radiation incidents increased to 28, including four Class II incidents. One of these involved contamination of the hair of an employee, with spread of contamination to a Richland dormitory. The information spread to local and national newspapers, including TIME magazine. Although publicity of this type is undesirable, true perspective on the case is that to assure complete isolation of the community from contamination, substantially more rigorous (and expensive) controls would be needed. The present degree of control is believed to represent a realistic compromise.

Throughout the month, unusual concentrations of radioactive particles persisted throughout the zone bounded by Klamath Falls, Oregon, Lewiston, Idaho, Boise, Idaho, and Spokane, Washington. Enough work has been done to furnish assurance that the phenomenon was not of local origin. However, there has been no acknowledgement of a plausible outside source.

A small group luncheon meeting was held to celebrate 1001 days of lost-time, injury-free experience, and to restate the safety program objectives of the department.

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Radiological Sciences Department

General (Continued)

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

<u>Inventor</u>	<u>Title</u>
M.F. Scoggins	A Mechanical Wind Recorder
R.G. Clark	An Electronic Recording Cup Anemometer
W.G. Spear	A Portable Alpha Survey Instrument

RADIOLOGICAL ENGINEERING

Work began on the additional pond at the Aquatic Biology Laboratory.

The study of the eventualities from a major reactor incident were further elaborated.

Radiological Sciences Department

RADIOLOGICAL RECORDS AND STANDARDS SECTION

General Statistics

	<u>June</u>	<u>July</u>	<u>1953 To Date</u>
Special Work Permits	503	542	3,454
Routine and Special Surveys	1,377	1,455	9,095
Air Samples	1,296	1,272	8,386
Skin Contamination	9	69	130

High levels of contamination were encountered during rehabilitation work at the tritium separations facility. More than 50 cases of skin contamination were reported. Three employees were removed from contaminated work zones when urine sample results exceeded 35 μ c of tritium oxide/liter. One of these employees received a puncture wound from a badly contaminated wire in addition to extensive skin contamination. His urine samples indicated a total body deposition of about 3.6 mc.

During investigation of contamination spread at the Hot Semi-Works, an employee was discovered to have had high level contamination his hair for about 18 hours. The employee failed to make complete personal surveys after work with contaminated materials on his previous shift. Contamination was spread to his dormitory in Richland.

2. Radiological Standards

Four Class II, six Class I, and eighteen informal radiation incidents were investigated. The Class II incidents included localized skin exposure (estimated maximum of 26 rep) from contaminated protective clothing at the Redox Laboratory, lung deposition of estimated 20 mg of Uranium at the UO_3 plant, hand and body exposure (11.5 and 1.6 rep, respectively) of employee at the 105-H reactor, and the Hot Semi-Works incident discussed above. The Class I incidents included a cave-in over a waste line at the T-Plant, unauthorized cell entry at the B-Plant canyon, deliberate misuse of respiratory protection at Redox plant, spread of uranium oxide dust from UO_3 plant, an incident involving batch size, and the tritium oxide body deposition case discussed above.

Two suspected cases of significant plutonium deposition in the body are being evaluated.

A report summarizing the location and extent of unconfined waste and contamination in the 200 Areas was completed by Graphical Index.

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DECLAS3. Exposure Records(a) Personnel Meters, and Records and PhotometryGeneral Statistics

	<u>June</u>	<u>July</u>	<u>1953</u> <u>To Date</u>
Gamma pencils read	219,662	202,442	1,575,986
Potential overexposures	13	7	63
Confirmed overexposures	1	0	6
Slow neutron pencils read	1,212	992	8,144
Potential overexposures	2	1	10*
Confirmed overexposures	0	0	0
Beta-gamma film badges processed	40,534	36,219	268,614
Potential overexposures	47	26	294
Confirmed overexposures	2	1	18
Fast neutron badges processed	601	505	3,653
Potential overexposures	0	0	0
Confirmed overexposures	0	0	0
Lost readings (all causes)	33	41	277

*Corrected.

(b) Bioassay1. Plutonium Analyses

Samples assayed	683	565	4,812
Results above detection limit	0	2	79
Resamples assayed	22	14	124
Results above detection limit	5	6	36
Maximum d/m/sample	1.44	2.25	2.25

2. Fission Product Analyses

Samples assayed	710	692	4,548
Results above 10 d/m/sample*	1	1	3

*Not including resamples of previous confirmed cases.

The one positive result of 10^{-4} μ c/sample was obtained following radiation incident, Class I, No.195, at the Redox plant. The re-sample for the one high case reported last month was below detection limits.

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3. Uranium Analyses

Results of 162 samples were as follows:

METAL PREPARATION - 300 AREA

<u>Job Description</u>	<u>End of 4th Day Exposure</u> <u>ug/liter</u>			<u>End of 2 Days-No Exposure</u> <u>ug/liter</u>		
	<u>Maximum</u>	<u>Average</u>	<u>Number Samples</u>	<u>Maximum</u>	<u>Average</u>	<u>Number Samples</u>
Canning	10	5	7	4	2	6
Machining	9	4	7	10	6	7
Melt Plant	23	8	20	23	8	18
Material Handling	12	12	1			
Testing	2	2	4			
Coverage	8	6	4			
Technical	9	6	8			

	<u>Before Job</u>			<u>After Job</u>		
	<u>Maximum</u>	<u>Average</u>	<u>Number Samples</u>	<u>Maximum</u>	<u>Average</u>	<u>Number Samples</u>
Random Samples	5	1	11	-	-	-

	<u>Miscellaneous Samples</u>			<u>(ug/liter)</u>
	<u>Maximum</u>	<u>Average</u>	<u>No. Samples</u>	
224-U	466	21	69	

<u>4. Tritium Analyses</u>	<u>< 2</u>	<u>2-20</u>	<u>20-35</u>	<u>35-75</u>	<u>> 75</u>	<u>Total</u>	<u>1953 To Date</u>
Number of samples	71	32	2	3	15	123	673

(c) Thyroid Checks

All thyroid checks reported were below the warning level.

(d) Hand Score Summary

There were 32,375 alpha and 37,070 beta scores reported. About 0.06% of the alpha and 0.35% of the beta scores were above the warning level. The large number of high beta scores was due to the fall-out reported previously, and the high scores were not tabulated in time for the June report. Except for the scores resulting from the fall-out, decontamination was attempted and successful in all cases.

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2. Radiological Standards (Continued)

<u>4. Calibrations</u>	<u>Number of Routine Calibrations</u>		
	<u>June</u>	<u>July</u>	<u>1953 To Date</u>
Fixed Instruments	152	120	883
Portable Instruments	2,583	2,672	15,273
Personnel Meters	15,124	17,411	75,039
Total	17,859	20,203	91,195

BIOPHYSICS SECTION

CONTROL UNIT

Regional Survey

The general findings are summarized in the following table:

<u>SAMPLE TYPE AND LOCATIONS</u>	<u>Activity Type</u>	<u>Average Activity Density ($\mu\text{c/cc}$)</u>
<u>Drinking Water</u>		
Benton City Water Co. Well	alpha	1.4×10^{-8}
Richland, N. Richland, Benton City Wells	alpha	$< 0.5 \text{ to } 1.0 \times 10^{-8}$
100 Areas	beta	$< 5 \text{ to } 7 \times 10^{-8}$
Pasco, Kennewick, McNary Dam	beta	$< 0.5 \text{ to } 1.0 \times 10^{-7}$
Backwash Solids-Pasco Filter Plant	beta	$1.3 \times 10^{-2} \mu\text{c/g}$
Backwash Liquids-Pasco Filter Plant	beta	2.3×10^{-7}
Sand Filter-Pasco Filter Plant	beta	$1.1 \times 10^{-4} \mu\text{c/g}$
Anthracite Filter-Pasco Filter Plant	beta	$3.6 \times 10^{-5} \mu\text{c/g}$
<u>Other Waters</u>		
300 Area Wells #1, 2, 3	alpha	$0.3 \text{ to } 3.1 \times 10^{-7}$
300 Area Well #4	alpha	2.5×10^{-7}
Well #4 measured as uranium	γ	2.0×10^{-7}
Other wells on the reservation	beta	$< 0.5 \text{ to } 1.4 \times 10^{-7}$
Columbia River-Hanford Ferry	beta	3.6×10^{-6}
Columbia River-Below reactors	beta	$2 \text{ to } 4 \times 10^{-6}$
Columbia River-Patterson to McNary	beta	3.2×10^{-7}
Columbia River-Shore mud	beta	$0.3 \text{ to } 1.0 \times 10^{-4} \mu\text{c/gm}$
Raw water-Operating areas	beta	$< 0.5 \text{ to } 2.6 \times 10^{-7}$
Reactor effluent retention basins	beta	$2.5 \text{ to } 4.1 \times 10^{-3}$
Reactor effluent retention basins	alpha	$< 5.0 \times 10^{-9}$
I-131 in farm wastes	I-131	9.0×10^{-7}
I-131 in Columbia River-Hanford	I-131	6.0×10^{-8}

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Radiological Sciences Department

Regional Survey (Continued)

SAMPLE TYPE AND LOCATIONS

	<u>Activity Type</u>	<u>Activity Density ($\mu\text{c/cc}$)</u>
<u>Atmospheric Pollution</u>		
Gross alpha emitters	alpha	$< 4 \text{ to } 9 \times 10^{-15}$
Gross dose rate-Separations areas	beta-gamma	1 to 2.2 mrep/day
Gross dose rate-Residential areas	beta-gamma	0.4 to 0.8 mrep/day
Filterable beta-Separations areas	beta	$1.3 \text{ to } 7.5 \times 10^{-12}$
I ¹³¹ -Separations areas	I ¹³¹	$0.5 \text{ to } 2.6 \times 10^{-12}$
I ¹³¹ -Separations stacks	I ¹³¹	4.1 curies/day
Active particles -Wash., Idaho, Ore., Mont.	-	0.05 to 0.3 ptles/m ³
Active particles -Hanford Operation	-	0.02 to 1.7 ptles/m ³
Tritium (as oxides)-Reactor stacks	T	0.17 curie/day
<u>Vegetation</u>		
		<u>$\mu\text{c/g}$</u>
Environs of Separations areas	I ¹³¹	$0.4 \text{ to } 2.4 \times 10^{-5}$
Residential areas	I ¹³¹	$< 3 \times 10^{-6}$
Eastern Wash. and Oregon	I ¹³¹	$< 3 \times 10^{-6}$
Non-volatile beta emitters-Wash. & Ore.	beta	$0.1 \text{ to } 1 \times 10^{-4}$
Alpha emitters-Separations areas	alpha	$2 \text{ to } 5 \times 10^{-7}$
alpha emitters-300 Area	alpha	1.2×10^{-6}

General increases in the concentration of radioactive particles in air samples were noted at all monitoring stations for the period from June 28 through July 22. Average concentrations, except at Redox, were in the range from 0.1 to 1.1 particles per cubic meter with particle activity as high as 400-500 d/m. Radiochemical analysis indicated the radioactive material to be composed of fission products. Similar measurements at Redox 614 Building during the same period showed concentrations at that location as high as 5.7 particles per cubic meter on July 9. Composition of material at this location showed a higher percentage of ruthenium than that at remote locations.

High emission of I¹³¹ in the Redox effluent gas occurred during the first part of the month due to faulty silver reactors. Highest average 24-hour emission occurred during the period ending July 7 when 27 curies of I¹³¹ were emitted. Monthly average was 4.1 curies per day. Ruthenium emission at this facility was also high with a monthly average of 0.7 curie per day, and a maximum emission of 3 curies for the 24-hour period ending July 14.

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Radiological Sciences Department

Regional Survey (Continued)

General increases in the activity density of I^{131} and filterable beta particle emitters were noted throughout the immediate environs during the early part of July. Maximum I^{131} concentrations were measured in the Separations areas where the average over a one-week period was 4.4×10^{-12} $\mu\text{c}/\text{cc}$. Filterable beta particle emitters averaged 1.7×10^{-11} $\mu\text{c}/\text{cc}$. over a 7-day period at a location near the Redox area.

Controlled vegetation sampling at residential areas near the plant showed that the activity density of non-volatile beta particle emitters had decreased to values in the order of magnitude expected for natural beta particle emitters in soil and vegetation. Measurements during the last week in July show average values ranging from 3 to 5×10^{-5} $\mu\text{c}/\text{g}$ at these locations.

Analytical Control Laboratory

Routine analyses were carried out as follows:

<u>Laboratory</u>	<u>Analyses Completed</u>	
	<u>July</u>	<u>1953 To Date</u>
<u>Type Sample</u>		
Vegetation	1400	8784
Water	1871	12967
Solids	337	2298
Air samples	489	2562
Uranium (fluorophotometer)	555	3487
Oil fog (fluorophotometer)	198	522
Special survey samples (RMSS)	30	194
Special survey samples (RMU and RS)	102	562
Phillips Petroleum-Tritium in water	<u>5</u>	<u>17</u>
Total	4987	31393
<u>Counting Room</u>		
Beta measurements (recounts included)	6714	44385
Alpha measurements (recounts included)	2146	17057
Control points (alpha and beta)	2666	18065
Decay curve points	4278	33448
Absorption curve points	<u>249</u>	<u>2143</u>
Total	16053	115098

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Radiological Sciences Department

Analytical Control Laboratory (Continued)

Results of analysis for the radioactive elements on the personal towel of an employee contaminated at the Hot Semi-Works showed more than 90% of the contamination to be ruthenium with less than 1% zirconium or strontium.

Radiochemical analysis of particulate material in Redox stack effluent gas showed significant amounts (2-7% of the active material) of strontium, zirconium, and cerium.

Control Services

Comparison of the blank readings of the Control Laboratory fluorophotometer before and after moving from 200-W to 300 Area revealed a significant increase from an average of 2.3 to 3.6. A statistical investigation was undertaken of the results of radiochemical analysis of effluent water from five tubes in the 100-D reactor during periods of varied operating levels.

Synoptic Meteorology

<u>Forecasts</u>	<u>Number made</u>	<u>July</u> <u>Percent Reliability</u>
Production	84	88.1
24-hour	62	89.0
Special	68	80.9

The monthly average temperature, 75.8° F, was near normal; highest temperature was 103° F on July 7. The number of clear days (27) was the highest monthly total on record.

RESEARCH AND DEVELOPMENT ACTIVITIES

Experimental Meteorology

Investigations were started on the possible use of Regional Survey air sample data as a means of establishing confidence limits on the 200-mile trajectory analyses.

Seven diffusion experiments were performed using a ground source during stable conditions. Photographic and oil-fog sampling techniques were applied in an effort to determine the significance of the measured plume widths in terms of concentration values. In addition to the

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Radiological Sciences Department

Experimental Meteorology (Continued)

standard methods of photographing oil-fog plumes, a new time exposure technique utilizing a neutral-density filter and grey-wedge was tried.

A verification procedure was devised to check the reliability of the Wind Predictor and was tried for the data of January, February, and March, 1953. Of the 135 forecasts tried, 76% were correct. Certain Wind Stations were found to be more reliable than others due primarily to the absence of local effects and the completeness of records.

A note was prepared showing the relationship between dilution and flow rate in the stack. The relationship permitted extending Church's values of least dilution to stacks emitting at any flow rate.

Earth Sciences

Northeastward movement of the ground water in the 241-T-361 reverse well area was confirmed by the appearance of contamination by beta-gamma emitters in well 361-T-15, and by the sharp rise in nitrate contamination at that well. The presence of minor amounts of nitrate in the water in that well since March, 1952, predicted the eventual appearance of the radioactive isotopes.

Fission product analysis of contaminated water from the 241-T and 241-B areas disclosed no appreciable contamination from fission product isotopes other than ruthenium.

Completion of a preliminary map of the project showing the concentration of sodium ion in the ground water indicated patterns of distribution that appear to correlate with the major sources of the ground water and the indicated directions of movement.

A survey of the U-swamp disclosed that about 3,500,000 gallons of water per day flows to the swamp, of which about 1,000,000 gallons per day flows to the Redox swamp via the overflow ditch. Current percolation rates in the 9-acre area of the U-swamp is thus about 6 gallons/square foot/day.

Equilibrium studies of the adsorption on soil of cesium at a concentration of $10^{-4}S$, where S is the saturation capacity, indicated

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Radiological Sciences Department

Earth Sciences (Continued)

that the relative adsorption from 0, 10, 20, and 40% sodium nitrate solutions was 1.0, 0.65, 0.47, and 0.05, respectively. The adsorption of cesium and strontium from aluminum coating wastes was also low relative to adsorption of these same isotopes from simple water solutions. The decontamination by soil of high salt waste streams is thus clearly inefficient. Adsorption of cesium was not adversely affected, however, by strontium in concentrations likely to occur in the process waste streams.

The adsorption of yttrium on soil, from concentrations likely to occur in process waste streams, was not appreciably decreased by the addition of sodium nitrate in concentrations up to 10%. The adsorption, in all cases, was higher than for cesium and strontium under similar experimental conditions.

Industrial Hygiene

Four grades of ultra filters were tested for use in aerosol studies. Pressure drop characteristics were obtained at various filtering velocities.

The filters were found to be rendered satisfactorily transparent under the microscope by the use of suitable immersion oils. They were wet ashed easily and were soluble in acetone, carbon tetrachloride, or pyridine. These filters have a glazed surface which should facilitate certain quantitative measurements.

Additional work was done on the development of a suitable technique for transferring particulate specimens on molecular filters to electron microscope screens. It was observed that the dissolution of a silica-coated filter by immersion in a solvent caused the delicate silica coating or replica to rupture due to swelling of the filter.

Redox samples collected during May were analyzed for Zr^{95} and Nb^{95} . The concentration in stack gas effluent was found to attain a peak coincidental with the start of ruthenium oxidation.

The survey of industrial noise continued with measurements being made in Separations areas T and S, also in reactor areas C and B.

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Radiological Sciences Department

Methods

A carrier-free oxidized Cr^{51} spike was prepared to determine the self-absorption in electroplated chromium. Even with the Cr^{51} oxidized and excess chromic ion removed by cation resin, good isotopic exchange was apparently not achieved with the added chromate carrier. It was nevertheless possible to obtain a self-absorption curve for that Cr^{51} which could be electroplated.

Tests were continued on the I^{131} collection efficiency of silver nitrate impregnated glass fiber filters. The filters retained more than 90% of the active isotope in a gas stream containing the elemental form; however, indications are that I^{131} present as HI is much less completely retained.

Progress was made on an analytical method for thorium employing mercuric ion as a carrier in an iodate precipitation. Final determination is made colorimetrically with the commercial reagent Thoron.

Potassium ethyl xanthate was examined in a preliminary way as a specific reagent for molybdenum and appeared to be satisfactory. Testing with radioactive tracer will follow when Mo^{99} is available.

Extensive tests were made on the laboratory model proportional sampler. With line flow rates varying by a factor of 13, the sample collected was 4.85% of the flow with a standard deviation of 0.18%; the nominal design value was 5.0%. Recommendations were made for the installation of waste line samplers.

Radiochemical Standards

Self-absorption factors were determined for Sr^{90} - γ^{90} in heavy residues of river water salts. Results showed that 65% of the beta particles were absorbed in one gram of residue on a one-inch disk.

A new method was used to establish self-absorption effects in which a source is built up by depositing a known quantity of a carrier-free radioisotope between very thin foils to simulate a sample with uniformly distributed active material. The method has the advantage of insuring uniform thin absorbing layers and appears to give reliable results. The mica window counter and 2 π proportional counter were used.

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Radiological Sciences Department

Radiochemical Standards (Continued)

The low geometry alpha counter was used to check the reported concentration of a plutonium solution carefully calibrated in another Hanford laboratory; agreement to 1% was obtained. Other experiments relating geometry to lateral position of the source were performed.

A prototype proportional counter was assembled and given preliminary test. Constructed from a GM tube shell, the counter should be able to replace the expensive mica window tube with no changes in tube support.

Disintegration rates of Co^{60} determined by coincidence counting were compared with rates determined with the 4π counter using recently established optimum source mounting conditions; agreement to within 1% was obtained. Satisfactory agreement was also obtained by mica window tube counting of the same sources.

A tritium oxide solution was calibrated using an internal alcohol-quenched GM tube and the recently adapted precise voltage measuring circuit. An aliquot of the hydrogen generated by circulation of the tritiated water vapor over hot zinc for several hours was made a component of the fill. Preliminary measurement gave a concentration 94% of that calculated from the purity and volume of the tritium burned to prepare the tritium oxide sample.

Physics

Following a study of the various types of fast neutron spectrometers to meet the needs of the Van de Graaff laboratory, it was decided to employ experimentally a scintillation detector with fast and slow coincidence circuits for discrimination against gamma rays.

The water tank for intercalibration of neutron sources was prepared for use. Waterproof containers for the neutron sources were constructed and a system devised for monitoring the resulting activity in the tank.

One of the counting sets in the Biophysics counting room has been altered by changes in circuitry and controls to be used in the manner suggested by the studies of Geiger counter age characteristics.

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Radiological Sciences Department

Physics (Continued)

It was found that the mathematics of the age-diffusion theory in the problem of the infinitely thin plane beta source was complex and that different assumptions would give different answers. A physically reasonable approach gave results in fair agreement with the small amount of existing experimental data.

An improved proportional thimble chamber was constructed for use in the measurement of low intensity gamma rays. It was smaller than the previous one and had thinner walls; the inner part of the wall was made of nearly tissue-equivalent plastic. The energy dependence should be smaller than that of the older model.

Instrument Development

Work on alpha scintillation phosphors for survey instruments was completed resulting in the engineering design of 2 instruments, a portable scintillation poppy and a contamination survey meter.

Tests of various power supplies showed that a "fly-back" developed locally would give at least 100 hours of continuous service and would fail sharply rather than gradually, thus not suffering any appreciable calibration change. This power supply is used in the new portable poppy. Extensive tests of a transistor high voltage power supply using Raytheon CK 722 junction-type transistors has shown no suggestion of humidity damage, contrary to fears expressed by some users. Except for long-term exposure to high humidities, the experimental and testing work was finished and a terminal report essentially completed. This power supply is used in the new contamination survey meter.

Two experimental instruments for monitoring fall-out were installed at the Meteorology Tower. One monitors ground contamination, and the other, the activity of rain. Ground contamination monitor data showed an average background count of 128 c/m with numerous short-term increases of 25% or more.

The distribution of time intervals between pulses produced by 2 commercial mica window counters was studied intensively. These counters produced an excess of short intervals at low counting rates (1000-2000 c/m), about the calculated number of intervals of all durations up to 800 μ sec at 3000 c/m, and a deficiency of short intervals at 4000 c/m. The study will be extended to counters of local manufacture in an attempt to explain and possibly correct some of the anomalous performance of mica window counters.

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Radiological Sciences Department

BIOLOGY SECTION

AQUATIC BIOLOGY UNIT

Biological Chains

No result.

Ecology

Survey of the Columbia River

The river water level receded during the month, which produced better sampling conditions in the shallow-water zone. Average activity densities at Hanford for plankton (1.3×10^{-2} $\mu\text{c/g}$) and small fish (1.5×10^{-3} $\mu\text{c/g}$) increased approximately three-fold over last month; bottom algae at 6.7×10^{-3} $\mu\text{c/g}$, and sponge at 2.7×10^{-3} , were doubled. The maximum value in adult fish, 2.8×10^{-2} $\mu\text{c/g}$ of scales with an associated flesh activity of 1.8×10^{-3} $\mu\text{c/g}$, exceeded the June maximum by a factor of ten. High activity densities were found in organisms inhabiting a temporary high water channel below 100-H. Shiners collected from this site during the middle of the month averaged 5×10^{-3} $\mu\text{c/g}$. Dredged samples indicated that most of the organisms which had inhabited the river bottom in the region of the McNary Dam pool have been destroyed by silt deposits.

Effluent Monitoring

Monitoring was continued with domestic rainbow trout. Twenty-five per cent area effluent was lethal. Increased mortalities occurred at 25% charcoal-filtered or unfiltered pile influent; growth retardation was indicated at the concentration of 10% filtered and unfiltered pile influent.

BIOLOGY CONTROL UNIT

Biological Monitoring

Radiochemical analysis indicates that Sr^{89} constitutes 30% of the total activity in young birds reared at the Redox swamp.

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Radiological Sciences Department

Juvenile cliff swallows collected along the river between 100-F and Hanford contained more active material than those collected near 100-H, due to higher activity densities in aquatic insects ingested. Maximum activity densities of 5×10^{-2} and 2×10^{-2} μc of P^{32} /g of bone were noted.

Rodent thyroid activity densities increased disproportionately in relation to Separations I^{131} emission, possibly due to the extensive "fall-out" of May 26, with a mean value for 20 samples of 1.5×10^{-3} $\mu\text{c/g}$.

Clinical Laboratory

In addition to the 287 routine blood examinations, ^{131}I creatinine analyses were performed by three dissimilar methods to assess the Jaffe-reaction observed in the blood of athyroid sheep.

Development was completed on a versene titration for serum calcium. This will assist in the study of thyroid gland damage and calcium metabolism.

Microscopy

Thirty-two routine histologic preparations of thyroid tissue, and 182 other tissues were prepared for the Toxicology Unit, plus a 35-slide series on the toxicity of I^{131} in sheep, with illustrative photomicrographs.

Biophysics delivered the evaporator for electron microscopy. Vacuum evaporation and shadowing was successful with chromium, tungsten oxide, palladium and silica. Routine electron microscopy services were performed for the Toxicology, Pile Technology, and Industrial Hygiene groups.

Radiochemistry

Analyses were made on 650 samples for I^{131} or P^{32} radioactivity, on 115 samples for tritium content, and on 44 for plutonium content by TTA extraction.

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Radiological Sciences Department

METABOLISM UNIT

Plutonium Absorption and Metabolism

Statistical analyses were completed on the data from the experiment comparing the efficacy of zirconium citrate, zirconium malate and Ca EDTA, administered 30 minutes after Pu injection, in preventing deposition and retention of Pu. Deposition of Pu in bone was reduced from 50% of the injected dose in controls to approximately 10% as a result of all treatments involving zirconium salts. Repeated injections of the therapeutic agent or combinations of Zr salts with Ca EDTA did not significantly lower bone deposition. Deposition of Pu in soft tissue was reduced from 25% of the injected dose in controls to approximately 10% as a result of all treatments involving Ca EDTA. Zirconium salts in single or repeated injections did not decrease soft tissue depositions, but, rather, showed some tendency to increase such deposition. Total deposition in the rat (64% in controls) was reduced to 23% by the most efficacious treatment, a combination of Zr citrate and Ca EDTA. Data from similar experiments in which therapy was instituted 30 days after Pu injection are incomplete, but indicate little success in removing Pu deposited in bone.

Analyses continued on rats from the experiment on absorption of higher concentrations of Pu from the G.I. tract. Data from the three lowest level groups are being statistically analyzed.

Fission Product Absorption and Metabolism

A pilot study was completed of the absorption of Sr from the G.I. tract of rats. The Sr was administered by stomach tube in the form of Sr-labeled plant material obtained by growing bean plants in nutrient solution containing high levels of Sr⁹⁰. Deposition in the bones of 4 rats averaged about 2% of the Sr⁹⁰ fed. Insignificant amounts were found in other tissues. This extent of deposition is somewhat smaller than that reported from administration of Sr in solution.

Tritium Studies

Methods were perfected for the exposure of rats to high concentrations of tritium gas. Preliminary results of analyses on the first animals exposed seem to confirm earlier indications that the ratio of tissue-bound to body water tritium is higher following exposure to tritium gas than it is following exposure to tritium oxide.

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Radiological Sciences Department

Calculations of radiation dosage in rats indicate that in the case of certain tissues which retain bound tritium for long periods following exposure, the total dose delivered from tissue-bound tritium may constitute about 1/3 of the total dose from bound tritium and body water tritium combined. Collagen and certain lipid fractions appear to receive the largest radiation dosage from tissue-bound tritium.

Mechanism of Radiation Damage to Plants

No result.

PLANT NUTRITION AND MICROBIOLOGY

Effect of Reactor Effluent on Growing Plants

Yields were obtained from barley raised for the second year using reactor effluent for the irrigation water. Data show no difference in seed or foliage yield between that raised on 100%, 5%, or no reactor effluent. Lack of effect this year as compared with last is attributed to the absence of chromium in the effluent during the early part of the growing season.

Absorption and Translocation of Radioelements in Plants

The effect of cerium concentration in nutrient solution on the uptake of this ion is being evaluated. At pH 6, the apparent concentration factor reaches a maximum with a leaf/root ratio of 0.00093 at an initial nutrient concentration of 0.1 μg Ce/ml.

RBE by Microbiological Methods

In anticipation of the completion of the automatic turbidimeter, experiments are under way to relate optical density to cell size and cell viability, with more precision.

Evaluation of the extent of fractionation of HTO by distillation has been attempted and it is apparent that even in quadruply distilled water there is inclusion of material which fractionates and strongly affects the chemical dosimeter even when no variation is detected by the usual counting. There is doubt whether the variation arises from tritium oxide fractionation or from an impurity which is carried along in the solution.

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Half destruction of biotin (10 $\mu\text{g}/\text{ml}$) occurs with 3.33 kilo rep in N_2 saturated solution, and with 0.8 kilorep in O_2 saturated solution. Biotin thus appears to be as radio resistant as Riboflavin and more resistant than folic acid.

Genetic Effects of Internally Deposited Radionuclides

An experiment to evaluate the effects of metabolized P^{32} has been set up using E. coli in a new radiation apparatus.

TOXICOLOGY UNIT

Experimental Animal Farm (Toxicology of I^{131})

The ratios of I^{131} in the thyroid gland to I^{131} fed daily (Q/q) in July were as follows:

	5 $\mu\text{c}/\text{day}$	0.15 $\mu\text{c}/\text{day}$
Original ewes	2.0	2.7
1950 Offspring	1.0	2.6
1951 Offspring	1.6	2.7
1952 Offspring	(being sacrificed)	
1953 Offspring	0.3	0.6

Histologic damage in the offspring from the 30 $\mu\text{c}/\text{day}$ ewes consisted of edema and lymphocytic infiltration (inflammation). The edema is a low-level effect and the inflammation is observed in medium dosage levels. The combination is suggestive of a change intermediate between the low and medium-level effect.

Necropsies were performed on 28 sheep during the month. This included all remaining animals in the 15 and 30 $\mu\text{c}/\text{day}$ group. Several 5 μc yearling ewes were also sacrificed. In all these animals there

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Radiological Sciences Department

appeared to be an increase in connective tissue in the thyroid gland as evidenced by resistance to incision.

New groups of adult ewes were initiated at 0.5 and 1.5 $\mu\text{c}/\text{day}$ levels.

Radioactive Particles Metabolism and Toxicity

Four mice were sacrificed 52 days after tracheobronchial injection of PuO_2 colloid (aqueous) of unknown (but very small) particle size. The mean estimated biological half-life was 14 days, which agrees well with reported values for inhalation studies.

Preliminary to initiating the actual tumor study in mice using PuO_2 , studies were performed using $\text{Fe}_2^{55}\text{O}_3$ to ascertain particle size distribution in the suspension and the total mass (or dose) represented by each particle size classification.

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FINANCIAL DEPARTMENT MONTHLY REPORT
JULY, 1953

In connection with the program carried out during the six months ending June 30 to take physical inventories of all materials in the custody of the General Electric Company except source and fissionable materials, final reconciliation with book figures was completed in July and appropriate adjusting entries made. The entire program required 13 physical inventories involving approximately 101,000 line items, with a total adjusted value of \$15,228,659. The adjustments for all inventories resulted in a net debit of \$2,025,997 to the accounts affected, the largest of which was a write-up of \$1,786,273 on the "Excess Materials and Equipment" account. This came about by reason of the revaluing, at acquisition value, of materials previously booked at percentages of acquisition value varying from 5% to 100%. Improved practices and controls relating to record keeping, pricing, warehousing and safeguarding throughout the Hanford Atomic Products Operation have resulted from the surveys, conferences, and field work performed in connection with this program.

The development of procedures for the conversion of the distributions of general supply store orders and accounts payable vouchers from a manual to an IBM system was completed in July, to become effective in August, as another step in utilizing IBM equipment to the fullest extent possible whenever savings in time and cost promise to improve accounting practices. In connection with this change, the calculation of charges on approximately 30,000 store issues, formerly done manually, will be automatically made by IBM equipment each month. The distribution of charges for duplicating and printing services performed by the Plant Auxiliary Operations Department were also made on a trial basis in July and the new routine will become effective in August.

Effective July 1, the Inventory Accounting group, General Accounting Unit, assumed the responsibility for maintaining values on excess property inventories, extending unit costs on store orders, and preparing book entries for general ledger accounts, all of which were previously performed by the Stores Unit.

An analysis by the Plant Accounts group of expenditures for plant and equipment at Hanford, representing expenditures under the du Pont contract as well as those made by the General Electric Company since it assumed its responsibilities on September 1, 1946, disclosed that the Government's capital investment as of June 30, 1953, was \$736,020,000. The completion of currently planned projects, including Program X, will bring the total investment to \$1,066,141,000.

Salary data for professional scientific employees of the Hanford Atomic Products Operation was furnished in July to the Accounting Services Division, Payroll Services Section, Schenectady, at its request, for inclusion in a national survey of professional scientific salaries being conducted by the Los Alamos Scientific Laboratory. The selection of the professional employees of Hanford to be included in the survey was made by the Salary Administration Section and the data was furnished by the Payroll Unit on forms provided by the Los Alamos Laboratory.

Forty-five, or approximately 23%, of the employees of the Accounting Section of the Financial Department have been placed in higher job classifications as a result of a joint review by unit supervisors and the Wage Rates Unit of the classifications of all non-exempt employees. The review of job classifications in the other two sections of the department is almost complete.

Surveys were conducted by Payroll personnel on Wednesday, July 8, and on Thursday, July 16, at the 300 Area badge houses to determine the time required by employees to punch time clocks at the close of the day shift. Results of the surveys were presented to management for consideration in conjunction with a study of quitting time practices in the 300 Area.

The Atomic Energy Commission approved the June 10 salary increase, which included adjustments in base salaries of up to \$3.20 a week plus a 1.47% revision in the overriding adjustment which makes it 12%, by issuing appropriate reimbursement authorizations on July 24. This will permit the payment of the increase, both on a current basis and retroactively, in August.

The AEC also issued, on July 23, a reimbursement authorization approving a new non-exempt classification, "Financial Analyst."

Statistics

A summary of cash disbursements and receipts (excluding reimbursements by the Atomic Energy Commission) for the months of July and June, 1953, is shown below:

<u>Disbursements</u>	<u>July</u>	<u>June</u>
Payrolls (Net)	\$3 094 714	\$2 686 016
Materials and Freight	1 303 294	1 523 315
Payroll Taxes	881 282	630 192
Payments to Subcontractors	631 893	817 366
United States Savings Bonds	233 126	167 714
Group Insurance Premium	126 822	126 369
Pension Plan - Employees' Portion	98 313	83 747
Other	162 998	328 459
Total	<u>6 532 442</u>	<u>6 363 178</u>

<u>Receipts</u>		
Rent	121 441	106 228
Hospital	70 177	66 110
Telephone	50 190	51 299
Electricity	49 102	64 891
Sales to AEC Cost-type Contractors	21 293	55 739
Sundry Accounts Receivable	13 539	15 364
Bus Fares	7 606	7 814
Refunds from Vendors	1 300	989
Other	3 772	23 080
Funds from Liquidation of United States Treasury Bonds Held in Annuity Fund	-0-	504 175
Refund of Insurance Premium	-0-	214 178
Interest Income from Administrative Fund	-0-	50 884
Refund from Administrative Fund	-0-	20 411
Total	<u>338 420</u>	<u>1 181 162</u>

Net Disbursements	<u>\$6 194 022</u>	<u>\$5 182 016</u>
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Advances as of July 31 and June 30, 1953, may be summarized as follows:

	<u>July</u>	<u>June</u>
Cash in Bank - Contract Accounts	\$3 448 962	\$4 642 984
Cash in Bank - Salary Accounts	50 000	50 000
Travel Advance Funds	<u>125 000</u>	<u>125 000</u>
Total	<u>\$3 623 962</u>	<u>\$4 817 984</u>

Personnel and Organization

	<u>Current Month</u>	<u>Prior Month</u>
<u>Personnel Changes During Month</u>		
Employees at beginning	334	336
Additions and transfers in	8	10
Removals and transfers out	<u>(10)</u>	<u>(12)</u>
Employees at end of month	<u>332</u>	<u>334</u>
<u>Personnel by Unit at Month-End</u>		
General	<u>9</u>	<u>9</u>
Reimbursement Unit	<u>4</u>	<u>4</u>
General Accounting Unit		
General Accounts	18	21
Inventory Accounting	7	6
Plant Accounts	30	29
Accounts Payable	36	35
Accounts Receivable	22	20
General	<u>3</u>	<u>3</u>
	<u>116</u>	<u>114</u>
General Cost Unit		
Consolidated Costs and Budgets	5	6
Plant Auxiliary Operations	18	15
Community Operations and Real Estate	8	10
Radiological Sciences and Other	7	6
Medical	3	2
General	<u>3</u>	<u>3</u>
	<u>44</u>	<u>42</u>
Manufacturing Cost Unit		
Costs and Budgets	31	33
General	<u>7</u>	<u>7</u>
	<u>38</u>	<u>40</u>
Engineering Cost Unit		
Project Section Costs	16	17
Design Section Costs	8	7
Technical Section Costs	10	10
General	<u>6</u>	<u>6</u>
	<u>40</u>	<u>40</u>
Payroll Unit		
Preparation and Employee Records	34	37
Confidential Payroll Records	7	7
Employee Benefit Plans & Payroll Reports	21	21
IBM Procedures	1	1
General	<u>2</u>	<u>2</u>
	<u>65</u>	<u>68</u>
Internal Audit Unit	<u>14</u>	<u>14</u>
Rotational Trainees	<u>2</u>	<u>3</u>
Total	<u>332</u>	<u>334</u>

Section Reports

The monthly reports of the three sections of the Financial Department, as listed below, are shown on the following pages:

Accounting Section

General Accounting Unit
General Cost Unit
Manufacturing Cost Unit
Engineering Cost Unit

Ia-1 through Ia-11
Ib-1 through Ib-2
Ic-1 through Ic-3
Id-1 through Id-3

Appropriations Section

Ie-1

Payroll and Auditing Section

Payroll Unit
Internal Audit Unit

If-1 through If-5
Ig-1

GENERAL ACCOUNTING UNIT
MONTHLY REPORT - JULY, 1953

ACCOUNTS PAYABLE

The volume and dollar value of work processed as July business in Accounts Payable decreased to some extent as compared with June. This was due to holding the books open later than usual in June in order to record as many costs in FY-1953 as possible.

In July, 3,404 invoices were booked totaling \$3,222,088. Freight bills processed during the month numbered 862 amounting to \$161,870. Cash disbursements amounted to \$3,204,603. New purchase orders received during the month numbered 2,021 and amounted to \$1,406,142.

Cash discount earned during the month amounted to \$3,475 as compared with the monthly average of \$3,982 for FY-1953.

The seventeen active contracts (excluding essential materials requirements contracts) being handled by Accounts Payable total \$12,469,283. Payments to contractors for work performed under these contracts during the month of July totaled \$620,980 and to date total \$3,901,260.

Payments have been made to National Carbon Company covering shipments of graphite under Special Agreement No. G-5 and G-23 in the amount of \$2,497,738 and \$251,261 respectively. Included in the payments under G-5 is an amount of \$89,450 representing final payment, including sample packaging, for 395,646 pounds of pile-grade graphite produced from impure graphite furnished by General Electric. The effective date of redetermination of prices for the remaining material to be delivered under G-5 was established as July 1, 1953, and negotiations as provided under the terms of the agreement are now in progress.

With respect to Special Agreement No. G-23, it is estimated that the effective date for price redetermination will be approximately September 18, 1953.

ACCOUNTS RECEIVABLE

The gross accounts receivable balance at July 31, 1953, amounted to \$298,677, a decrease of \$17,382 from the balance at June 30, 1953. This decrease represents a \$5,991 decrease in hospital accounts, \$2,950 decrease in electricity accounts, \$4,674 decrease in rent accounts, and a net decrease of \$3,767 in all other accounts.

Effective July 1, 1953, Commonwealth, Incorporated, replaced Universal Food Service, Incorporated, as manager of the North Richland Construction Camp. Wage deduction authorizations were revised, and new authorization forms were executed by all General Electric employees who were occupying barracks or trailer space in North

General Accounting Unit

ACCOUNTS RECEIVABLE (CONTINUED)

Richland and who were making rental payments through payroll deduction. Revised authorization forms were also furnished the new contractor for use when assigning rental space in North Richland to General Electric employees.

Quarterly accounts receivable report was issued in July showing accounts receivable balances at June 30, 1953 amounting to \$316,059. Of this amount \$210,169, or 67%, represented current accounts; \$35,104, or 11%, represented accounts thirty to sixty days old; \$18,559, or 6%, represented accounts sixty to ninety days old; and \$51,227, or 16%, represented accounts over ninety days old. This latter amount included accounts totaling \$12,870 which have been forwarded to collection agencies. The reserve for doubtful accounts as shown on this report was \$29,504.

Report of total billings to other Atomic Energy Commission Cost-Type Contractors was issued in July, covering excess materials, equipment, and special services furnished these contractors during the period of October, 1950 (date of first billings) through June, 1953. Total billings during this period amounted to \$3,166,670. Of this amount, \$400,185 was billed during FY-1951, \$2,075,290 during FY-1952, and \$691,195 during FY-1953. Approximately 39% of total billings, \$1,246,942, was made to E. I. du Pont de Nemours and Company.

Out-patient invoices issued in July at Kadlec Hospital numbered 1,660 and totaled \$7,582. Although the adult patient day census decreased from 74.0 in June to 72.4 in July, in-patient revenue increased to \$59,291 in July as compared to \$53,270 in June. This increase in revenue was primarily the result of increased hospital rates effective July 1, 1953.

With respect to the proposed increase in rental rates of Richland residences and dormitory rooms, plans have been completed for the necessary work in revising accounting records when and if this increase is made effective.

GENERAL ACCOUNTS

A revised procedure with respect to the provision of funds by the Atomic Energy Commission for current operations became effective July 1, 1953. Prior to that date, funds for the entire month were advanced at the beginning of each month. Revised procedure provides for a weekly advance estimated to cover expenditures for the ensuing week only. This in effect will result in slightly reduced balances in contract bank accounts and will considerably reduce the amount previously reported as advances from the Atomic Energy Commission. In prior months, the Atomic Energy Commission advance account has operated as an imprest fund and the month-end balance of \$10,000,000 has included current month's disbursements not yet reimbursed. The balance in the advance account at July 31, 1953 of \$3,623,962 represents only cash on deposit in contract bank accounts.

General Accounting Unit

GENERAL ACCOUNTS (CONTINUED)

Reports on travel and living expenses were considerably revised this month. Revised reports show information as to detail of expenses incurred by each employee and a comparison with the amount reimbursed by the Atomic Energy Commission. Budgets have been established for each department to cover the difference between expenses incurred and expenses reimbursed by the Atomic Energy Commission. This report will indicate to each manager the extent to which his organization is operating within these budgeted funds.

A new general ledger chart of accounts was issued in July and the decimal numbering system has been superceded by a four digit numbering system adaptable to an IBM operation. This change is made in anticipation of more extensive use of IBM equipment in our overall accounting procedures.

Effective August 1, 1953, a centralized control group will be established in General Ledger. The responsibilities of this group will be to control work processed through IBM and to prepare journalizations of IBM distributions. At the present time this includes salary distributions, and distribution of store orders and accounts payable vouchers. Procedures have been written and training of personnel started in preparation for this work.

Changes were made this month in procedures covering off-site shipments by General Electric of government property. Responsibility for controlling, journalizing, and billing of all government property shipped off the project was centralized in General Accounts. The work of pricing, extending of unit prices, and preparing journal entries and requests for billing was previously handled by Stores Unit. This change will result in reduced personnel in Stores Unit with no increase in personnel in General Accounts.

INVENTORY ACCOUNTING

As a result of physical inventories completed in June, 1953, all inventory accounts were accordingly adjusted to actual quantities on hand. Also, excess inventories were revalued to acquisition cost, and capital excess equipment was transferred from the excess inventory account to a capital account. Report was issued on July 20, 1953, as of June 30, 1953, incorporating these revisions.

Prior to July 1, 1953, Stores Unit was responsible for extending unit costs of all documents affecting excess accounts and maintaining total dollar value of excess property. Stores also determined book entries to be made to general ledger excess accounts. In order to eliminate duplication of work by financial and custodial personnel as to the accounting for excess property and in keeping with the objectives for which Inventory Accounting was established, responsibility for this work was transferred from the Stores Unit to Inventory Accounting. Since this transfer of responsibility necessitated procedural changes, meetings were held with Stores Unit personnel regarding procedures to be followed by them in processing documents for effective financial control of excess property.

General Accounting Unit

INVENTORY ACCOUNTING (CONTINUED)

During the month, time was devoted in furnishing the Atomic Energy Commission Finance personnel certain breakdowns of inventory dollar amounts for incorporation in their fiscal year-end financial reports.

A meeting was held during the month with Transportation personnel to initiate a procedure to be followed by them effective July 1, 1953 in maintaining records and processing documents for control of railroad equipment parts for which they are responsible. At this same meeting possible changes in procedural requirements as to the fuel and lubricants and road materials inventories were also discussed.

Time was devoted during the month to making certain revisions in the inventory report which will be issued for July. These revisions were made in order to consolidate like inventories by responsible organizations so that a better comparison can be made with the number of months supply of inventories on hand and the established inventory bogeys. In addition to revisions in the inventory report, additional segments of the report will be issued in July covering activity in the newly established Stand-by Inventory Reserve and Excess Equipment Reserve accounts.

As of July 24, 1953 the manual extension, calculation and distribution of store orders (approximately 1,300 per day) was discontinued by Inventory Accounting. This work is now done in a more expedient manner by use of IBM equipment.

PLANT ACCOUNTS

During the month an analysis was made of expenditures for plant and equipment, beginning September 1, 1946 through calendar year 1952. The following summary shows the plant value at the inception of our contract, increases each year thereafter, and the value at December 31, 1952:

	(Amounts in Thousands)
Balance at September 1, 1946, representing du Pont expenditures	\$328 193
Increases by calendar year:	
9-1-46 to 12-31-46	\$ 857
1947	18 806
1948	150 525
1949	43 364
1950	26 699
1951	84 051
1952	<u>62 482</u>
General Electric Expenditures to 12-31-52	<u>386 784</u>
Total plant and equipment at 12-31-52	<u>\$714 977</u>

General Accounting Unit

PLANT ACCOUNTS (CONTINUED)

Value of plant was also segregated as to du Pont expenditures, General Electric expenditures prior to Program X, and estimated plant cost after completion of Program X. These costs may be summarized as follows:

(Amounts in Thousands)

Total du Pont costs	\$ 324 081
Expansion from 9-1-46 to date, including unexpended authorized project costs and excluding Program X Expansion	<u>478 393</u>
Total Plant, excluding Program X	802 474
Program X Expansion (authorized to date)	<u>263 667</u>
Total estimated Plant after completion of Program X	<u>\$1 066 141</u>

Depreciation accruals were reviewed, beginning with January 1, 1947 to June 30, 1953. Depreciation accrued was segregated according to fiscal years and allocated to the major functions as follows:

(Amounts in Thousands)

Fiscal Year	Production	Stand-by	Research	Medical & Community	Other	Total
1- 1-47 to						
6-30-47	\$ 7 208	\$ 527	\$ 154	\$ 967	\$ 851	\$ 9 707
1948	14 964	1 053	307	1 936	1 703	19 963
1949	16 147	995	311	2 221	1 703	21 377
1950	20 524	1 701	350	3 336	1 731	27 642
1951	21 106	944	460	3 258	1 661	27 429
1952	22 685	57	520	3 325	883	27 470
1953	<u>40 622</u>	<u>2 136</u>	<u>842</u>	<u>3 452</u>	<u>364</u>	<u>47 416</u>
Total	<u>\$143 256</u>	<u>\$ 7 413</u>	<u>\$ 2 944</u>	<u>\$ 18 495</u>	<u>\$ 8 896</u>	<u>\$181 004</u>

A report was received from Electrical Distribution summarizing all substations, transformer and switching stations by code numbers, location, number of transformers, etc. This report was verified through physical inventory of items included and is to be used in connection with unitization of Project C-403, "New Fences for Distribution and 230 KV Stations".

General Accounting Unit

PLANT ACCOUNTS (CONTINUED)

Annual reports on plant and equipment changes were prepared and submitted to the Atomic Energy Commission during the month. A summary of the report entitled, "Analysis of Changes in Completed Plant and Related Reserves", shows the following:

	(Amounts in Thousands)	
	<u>Asset</u>	<u>Reserve</u>
Balance, June 30, 1952	\$539 581	\$173 405 CR
Adjustments	1 482	1 715 CR
Accruals (Reserve)		50 158 CR
Construction and Purchases	175 431	
Additions - Intra AEC Transfers	5 813	246 CR
Retirements		
Book Costs	3 628 CR	3 482
Removal Costs		162
Salvage Credits		284 CR
	<hr/>	<hr/>
Balance, June 30, 1953	<u>\$718 679</u>	<u>\$222 164 CR</u>

Completed Plant according to the Atomic Energy Commission definition includes Plant and Equipment in Service, Plant and Equipment Held for Future Use, Plant and Equipment Not Used and Not Currently Useful, Major Construction Program Facilities, and Spare Equipment Held in Storage. The above totals exclude Major Construction Program Equipment, Construction Work in Progress, and Retirement Work in Progress.

General Accounting Unit

	<u>July</u>	<u>June</u>
<u>Accounts Payable</u>		
Balance at Beginning of Month	\$ 602 457	\$ 390 372
Vouchers Entered	3 222 088	3 544 012
Cash Disbursements	3 204 603 DR	3 509 448 DR
Cash Receipts	1 300	989
Other	<u>176 483 DR</u>	<u>176 532</u>
Balance at End of Month	<u>\$ 444 759</u>	<u>\$ 602 457</u>
Number of Vouchers Entered	3 404	4 048
Number of Checks Issued	2 176	2 151
Number of Freight Bills Paid	862	1 319
Amount of Freight Bills Paid	\$ 161 870	\$ 327 748
Number of Purchase Orders Received	2 021	1 424
Value of Purchase Orders Received	\$1 406 142	\$ 575 851
<u>Cash Disbursements</u>		
Payrolls (Net)	\$3 094 714	\$2 686 016
Material and Freight	1 303 294	1 523 315
Payroll Taxes	881 282	630 192
Lump Sum and Unit Price Subcontracts	631 893	817 366
United States Savings Bonds	233 126	167 714
Group Insurance Premium	126 822	126 369
Pension Plan - Employees' Portion	98 313	83 747
All Other	<u>162 998</u>	<u>328 459</u>
Total	<u>\$6 532 442</u>	<u>\$6 363 178</u>

General Accounting Unit

	<u>July</u>	<u>June</u>
<u>Cash Receipts</u>		
Advances from Atomic Energy Commission	\$5 000 000	\$ -0-
Rent	121 441	106 228
Hospital	70 177	66 110
Telephones	50 190	51 299
Electricity	49 102	64 891
Sales to Cost-type Contractors	21 293	55 739
Sundry Accounts Receivable	13 539	15 364
Bus Fares	7 606	7 814
Refunds from Vendors	1 300	989
Prior Month's Expenditures Reimbursed by Atomic Energy Commission	-0-	6 178 074
Funds from Liquidation of United States Treasury Bonds held in Annuity Fund	-0-	504 175
Refund of Insurance Premium	-0-	214 178
Interest Income from Administrative Fund	-0-	50 884
Refund from Administrative Fund	-0-	20 411
Other	3 772	23 080
Total	<u>\$5 338 420</u>	<u>\$7 359 236</u>

Bank Balances at End of Month

Chemical Bank and Trust Company - New York Contract Account	\$ 924 275	\$1 955 632
Seattle-First National Bank - Richland Contract Account	1 637 016	2 020 178
United States Savings Bonds Account	214 232	156 566
Salary Account No. 1	20 000	20 000
Salary Account No. 2	30 000	30 000
Travel Advance Account	79 580	95 226
National Bank of Commerce - Richland Contract Account	887 671	667 174
Total	<u>\$3 792 774</u>	<u>\$4 944 776</u>

General Accounting Unit

	<u>July</u>	<u>June</u>
<u>Accounts Receivable</u>		
Hospital	\$ 120 229	\$ 126 220
Sundry	65 650	67 370
Cost-type Contractors	36 601	37 329
Equipment Sales to Facilities	29 316	29 665
Telephones	22 545	23 667
Electricity	14 873	17 823
Rent	7 748	12 422
Safety Shoes	1 511	1 347
Loans to Employees	204	216
Subtotal	<u>298 677</u>	<u>316 059</u>
Reserve for Bad Debts	<u>30 071 CR</u>	<u>29 504 CR</u>
General Ledger Balance	<u>\$ 268 606</u>	<u>\$ 286 555</u>

<u>Hospital</u>		
Number Out-patient Invoices Issued	1 660	1 720
Charges During the Month	\$ 66 873	\$ 60 234
Collections - Cash	70 177	66 110
- Payroll Deductions	4 002	4 894

<u>Sundry</u>		
Number Invoices Issued	377	306
Amount of Invoices Issued	\$ 11 725	\$ 31 745
Cash Received	13 539	15 364

<u>Cost-type Contractors</u>		
Number Invoices Issued	34	30
Amount of Invoices Issued	\$ 20 712	\$ 28 998
Cash Received	21 293	55 739

<u>Telephones</u>		
Working Telephones (excludes official telephones)	6 077	6 053
Telephone Work Orders Processed	308	245
Charges During the Month	\$ 50 295	\$ 50 294
Cash Received	50 190	51 299

<u>Electricity</u>		
Number of Bills Issued	6 309	6 215
Amount of Bills Issued	\$ 46 587	\$ 53 601
Cash Received	49 102	64 891

General Accounting Unit

	<u>July</u>	<u>June</u>
<u>Accounts Receivable</u>		
<u>Rent</u>		
<u>Houses</u>		
Number Houses Occupied	6 029	6 044
New Leases and Lease Modifications	164	263
Lease Cancellations	149	254
Charges During the Month	\$ 244 182	\$ 245 548
Collections - Cash	42 892	44 790
- Payroll Deductions	204 504	202 942
<u>Dormitories</u>		
Number Rooms Occupied	1 002	1 005
New Assignments	130	86
Removals	133	111
Charges During the Month	\$ 15 280	\$ 15 557
Collections - Cash	3 715	4 299
- Payroll Deductions	12 259	12 083
<u>Facilities</u>		
Number Facility Leases	148	146
Revenue	\$ 74 834	\$ 57 139
	<u>Number</u>	<u>Amount</u>
<u>Uncollectible Accounts (Total to Date)</u>		
Accounts Forwarded to Collection Agencies	529	\$ 44 024
Accounts Returned as Uncollectible	178	23 599
Collections	183 -1)	7 230 -2)
Balance at Collection Agencies July 30, 1953	<u>195</u>	<u>\$ 13 195</u>

(1- Includes 156 accounts collected in full and 27 accounts partially collected.

(2- Represents total collections, half of which is remitted to General Electric.

General Accounting Unit

	<u>July</u>	<u>June</u>
<u>Travel Advances and Expense Accounts</u>		
Cash Advances - Beginning of Month	\$ 29 774	\$ 56 452
Advances During the Month	38 641	57 330
Expense Accounts Submitted	17 312 CR	67 339 CR
Cash Refunded	<u>6 700 CR</u>	<u>16 669 CR</u>
Cash Advances - End of Month	<u>\$ 44 403</u>	<u>\$ 29 774</u>
Outstanding Cash Advances		
Current	\$ 38 550	\$ 25 189
Over 30 Days	<u>5 853</u>	<u>4 585</u>
Total	<u>\$ 44 403</u>	<u>\$ 29 774</u>
Travel and Living Expenses		
Paid Employees	\$ 17 219	\$ 65 645
Billed to Government	16 202	62 039
Balance in Variation Account at End of Month	1 017 DR	23 489 DR -1)
<u>Inventories</u>		
Current Inventories		
General Supplies	\$ 1 234 608	\$ 1 206 096
Fuel and Lubricants	89 228	89 204
Essential Materials	<u>3 411 422</u>	<u>3 709 651</u>
Total Current Inventories	<u>4 735 258</u>	<u>5 004 951</u>
Stand-by	2 608 723	2 559 542
Bulk Steel	102 863	109 732
Special Materials	282 897	284 726
Excess Materials	<u>2 818 882</u>	<u>2 817 723</u>
Total Inventories - Gross	<u>10 548 623</u>	<u>10 776 674</u>
Less: Excess Inventory Reserve	(2 788 620)	(2 817 723)
Stand-by Inventory Reserve	<u>(765 085)</u>	<u>(767 863)</u>
Total Inventory Reserve	<u>(3 553 705)</u>	<u>(3 585 586)</u>
Total Inventories - Net	<u>\$ 6 994 918</u>	<u>\$ 7 191 088</u>
Spare and Excess Equipment		
Recorded in Plant Accounts		
Spare Equipment Held in Storage	\$ 1 494 164	\$ 1 510 834
Excess Equipment	1 727 888	1 670 440
Excess Equipment Reserve	<u>(1 733 846)</u>	<u>(1 670 440)</u>

(1- This amount transferred to Schenectady at June 30, 1953.

GENERAL COST UNIT
MONTHLY REPORT
JULY, 1953

Procedures for processing APV's and stores orders through IBM were completed in July. These procedures will be effective for month of August and represent additional progress being made toward preparation of an operating report on the IBM machines.

The Annual "Bogey" for FY 1954 for Production and Research and Development Costs was completed and issued on July 10, 1953. Minor revisions, due to revised production "bogeys" by Manufacturing Department, were made on July 31, 1953.

Consolidated Costs and Budgets

Special performance bogeys, prepared with the assistance of department managers, are being prepared for each department and will appear in a consolidated presentation early in August.

An analysis of inventory activity for FY 1953 was made at request of AEC. The results of the analysis or survey were used in the General Electric Company comments regarding the AEC Financial Plan for FY 1954.

Assistance was also provided to Purchasing and Stores personnel in relating inventory levels on June 30, 1953, to budget and financial plans levels on June 30, 1953.

Plant Auxiliary Operations

Job write-ups for non-exempt employees were completed and forwarded to Wage Rate Unit for approval. In conjunction with approval of these jobs by Wage Rate Unit, several employees within the Unit were placed on new assignments.

Performance bogeys for FY 1954 were prepared and reviewed with Section Managers during the month.

Year-end closing of FY 1953 costs was accomplished in a satisfactory manner. Expense items were accepted (including accruals) through the last day of the year in order to get all FY 1953 costs included in June, 1953 operating reports. Other than later closing, very little difference was noted in issuing June reports compared to previous months.

It was apparent during the latter part of FY 1953 that several liquidation rates were in need of revision. Studies have recently been completed, and effective in July liquidation rate changes will be made in the following units:

Telephone	Stenographic
Railroad	Statistics
Automotive & Heavy Equipment	Computing
Office Machine Repair	Graphics
Transportation Services	

A complete schedule of all Plant Auxiliary Operations Department liquidation rates is being prepared and will be distributed in August.

Community

Budget figures were adjusted to the Financial Plan and the first quarter costs were split into monthly costs in preparation for recording on the July Cost Report.

Work on the revised cost system was completed and placed into effect July 1, 1953. The transition was made with complete cooperation of the Community Operation and Real Estate Department personnel and with an outstanding degree of accuracy.

Medical

A bogey for FY 1954 was completed and submitted for each section of the Medical Department. The bogey figures exceed those of the FY 1954 budget due to increased salaries and increased charges from other departments.

Staff

Revisions to the quarterly bogey for fiscal year 1954 were prepared, with known changes being taken into consideration. In addition to the cost bogey, a personnel bogey was prepared for all departments.

Considerable time was spent in determining the most feasible program in which to make anticipated reductions in Research and Development expenditures. The recently prepared bogey for Research and Development takes into consideration these reductions and is directly related to the AEC Financial Plan in total.

Initial screening was begun in the latter part of July on all store orders originating in the various staff departments. This was done and will be carried on in accordance with the recently announced procedure to facilitate the extension and distribution of all stores tickets by IBM.

MANUFACTURING COST UNIT
JULY, 1953

GENERAL

J. R. Davir was appointed to represent the Financial Department on the Accident Prevention Committee for the 700 Area.

A complete review of all non-exempt jobs in the Manufacturing Cost Unit was completed during the month.

PRODUCT COST ACCOUNTING

Unit Costs on a current basis, including feed material, conversion, and depreciation, were computed for calendar years 1947 through 1952. Unit costs were also computed for six month periods from January 1, 1947 through June 30, 1953.

Actual overliquidations of product shipments for the first eleven months of Fiscal year 1953 plus an estimate for June, 1953 were transferred to A.E.C. prior years cost. These overliquidations were the result of crediting inventories at current costs which were higher than the unit cost of beginning inventories. Beginning inventories included SF Material at a low average price.

The possibility of using printed forms in the preparation of the Product Cost Report was investigated with favorable results. A considerable savings in time and a more legible report are anticipated. The use of printed headings and accounts will eliminate approximately three days of preparation.

Standard billing prices on Plutonium were again decreased to bring them more in line with current unit costs.

MAINTENANCE AND SPECIAL REQUESTS

Considerable time was spent during the month to get unmatched detail (work order codes which do not match with any open work order) as low as possible prior to year end closing.

A revised procedure for the handling of Hanford Irradiation Requests and Other Services was issued during the month.

BUDGETS

The breakdown by months of the first and second quarters of the revised FY 1954 budget was issued during the month. Work was immediately started to complete the breakdown of the third and fourth quarters to provide budget information for future cost bogeys.

REPORTS & RECORDS

The Manufacturing Department Operating Report for period ended June 30, 1953 was issued under the date of July 15, 1953. This report contained the following year-to-date adjustments:

1. Essential Materials Inventory Adjustment \$113,821.
2. Project cost transferred to expense \$11,552.

A chronological listing of Year-to-Date adjustments for the Fiscal Year 1953 was also issued.

The Statements of Operating Costs by process codes for Metal Preparation and Reactor Sections showing costs for the 12 months of Fiscal Year 1953 were issued in their entirety. For Separations Section these reports were issued as follows:

Process Sub-Section Analytical

THP - 3 months cost April through June, 1953

234-5 Facility - 9 months cost October through June, 1953

UO-3 - 8 months cost November through June, 1953

Radiation Monitoring - all 12 months of Fiscal Year 1953

New Operating Report forms were designed for use beginning July, 1953. These new forms were improved by bringing to the front page the "Distribution of Costs". It is felt that the report will be easier to read.

Beginning with July, 1953 Operating and Cost Reports 6281-Plant Engineering Unit of Separations Section will stop the accumulation of costs by Work Orders and will liquidate their cost at a Standard rate per hour.

METAL PREPARATION SECTION ACCOUNTING

The Space Occupancy rental rates were reviewed and revised on the basis of recent studies made on Steam, Water, Air and Sewage. Janitor Services and building maintenance rates were adjusted to reflect recent wage increases and minimize variances between actual cost and rental rates.

A rough estimate of Unit Cost for the preparation of slugs was prepared for FY 1955.

Some ground work has been done to set up essential materials on a perpetual inventory basis.

A complete review of Standards for the preparation of slugs has been made and the information has been made available for the Reports and Records group to prepare variance reports.

REACTOR SECTION ACCOUNTING

Two methods of cost distribution were analyzed and revised effective July 1, 1953. Both items, steam consumption and electrical consumption, are very significant cost items and the revised distribution methods will afford more direct and realistic cost reporting.

A study of steam generation costs during the heating season has resulted in establishing a standard out-of-pocket rate per unit for charging the landlord account for heating steam. This will mean that the cost of steam to production will not be effected by the change in seasons as in the past affording a more direct control of production costs.

REACTOR SECTION ACCOUNTING (Continued)

In April the Reactor Section, Electrical Maintenance Unit, through the cooperation of the Electrical Distribution Unit of the Plant Auxiliary Operations Department, established a peak demand control mechanism whereby the Power sub-section is notified when a new peak is approaching and they arrange to drop load wherever possible and avoid setting a new peak due to temporary demands. As a result of this control the charges to all consumers will be based on KW demand at the time a peak is set. In this way the cost will reflect the efficiency and control of all users and will be consistent with the way the plant is billed for electricity.

The Operations sub-section physical inventory for 100-H Area was witnessed and verified on July 29. All material was found stored in an orderly manner which expedited the count.

SEPARATIONS SECTION ACCOUNTING

Unit Cost explanations for June and a forecast covering the period July through December for BiPO₄, Redox, 234-5, TBP, and UO-3 were prepared and submitted at the monthly cost meeting held July 24, 1953 in the 200 West Area.

Separations Section portion of the Quarterly Savings and Improvement Report, EW-28574, covering the period April 1, 1953 through June 30, 1953 was prepared and forwarded to the Manager, Manufacturing Department on July 3, 1953.

A variance Report indicating the deviation between Actual Cost and Standard Cost for the Redox, BiPO₄, TBP, UO-3, and Metal Fabrication processes was prepared and presented in the Section Cost Meeting.

ENGINEERING COST UNIT
MONTHLY REPORT - JULY, 1953

DESIGN COST

Cost transfers to Kaiser Engineers decreased during the month of July when compared with June, mainly due to a decrease in equipment transfers and in service costs. Service costs for June reflected year end adjustments of standing accruals. Transfers to Blaw-Knox for construction equipment and stores issues also decreased.

	<u>Number of Invoices</u>		<u>Total Cost Billed</u>	
	<u>To Kaiser</u>	<u>From Kaiser</u>	<u>To Kaiser</u>	<u>From Kaiser</u>
July	38	18	\$ 64 916.53	\$158 148.67
June	41	21	161 658.46	170 487.85

Cost Transfers to Kaiser Engineers from General Electric:

	<u>July</u>	<u>June</u>
Services - Telephone, Electrical, Clerical,		
Patrol and Fire	\$ 42 448.13	\$ 63 369.30
Work Orders	16 640.92	21 427.51
Major Construction Program Equipment -		
Net Book Value	9 696.67	64 227.31
Railroad Car Handling Cost	9 040.00	8 960.00
Excess Material Withdrawals	6 379.30	6 992.96
Store Orders Other Than Excess	3 563.33	2 856.45
Reproduction	836.94	1 140.03
Major Equipment Repair	598.46	3 510.26
Other	280.86	477.69
Excess Material Declarations	(11 247.77)	
Major Equipment Overhaul and Repair -		
Monthly Accrual	(13 320.31)	(11 303.05)
	<u>\$ 64 916.53</u>	<u>\$161 658.46</u>

Cost Transfers from Kaiser Engineers to General Electric:

	<u>July</u>	<u>June</u>
Graphite Fabrication	\$ 69 410.57	\$ 62 641.12
Major Construction Program Equipment -		
Net Book Value	56 523.84	34 532.90
Stores Issues	22 263.84	60 626.94
Work Orders	8 332.59	10 630.86
White Bluffs Utilities	1 601.85	1 015.12
Other	13.98	1 040.91
	<u>\$158 148.67</u>	<u>\$170 487.85</u>

Engineering Cost Unit

DESIGN COST (Continued)

	<u>Number of Invoices</u>		<u>Total Cost Billed</u>	
	<u>To Blaw-Knox</u>	<u>From Blaw-Knox</u>	<u>To Blaw-Knox</u>	<u>From Blaw-Knox</u>
July	26	6	\$ 35 190.40	\$ 5 719.51
June	28	5	81 535.93	2 443.80

Cost Transfers to Blaw-Knox from General Electric:

	<u>July</u>	<u>June</u>
Stores Issues Other Than Excess	\$ 11 941.80	\$ 28 317.59
Major Construction Program Equipment - Net Book Value	8 125.82	14 772.51
Excess Material Withdrawals	5 208.21	27 311.89
Utility Services - Telephone and Water	5 099.67	5 665.42
Services - Clerical and Patrol	1 580.74	2 495.63
Reproduction	1 542.94	997.86
Work Orders	1 114.25	529.03
Railroad Car Handling Costs	600.00	1 440.00
Other	186.22	6.00
Excess Material Declarations	(209.25)	
	<u>\$ 35 190.40</u>	<u>\$ 81 535.93</u>

Cost Transfers from Blaw-Knox to General Electric:

	<u>July</u>	<u>June</u>
Stores Issues	\$ 3 001.56	\$
Major Construction Program Equipment - Net Book Value	2 717.95	2 011.80
Other		432.00
	<u>\$ 5 719.51</u>	<u>\$ 2 443.80</u>

The Design Section cost statements were issued on July 20, 1953. Recast of the Budget for FY 1955 and Revision of Budget for FY 1954 was completed on July 31, 1953. Information was furnished the Design Planning Section for their review of prior design costs and recasting these charges into new classifications, detailing Design Scope, Detail Design and Design Liaison. All current costs will be recorded in these new accounts.

TECHNICAL COST

June operating cost reports were issued to the managers in Technical Section and Engineering Administration Sub-Section on July 20, 1953. Detailed reports on Research and Development costs were issued on July 22, 1953 following the monthly cost analysis letter of July 21, 1953.

Engineering Cost Unit

TECHNICAL COST (Continued)

Several accruals were made in July (applicable to June costs) for material and off-site assistance costs which had been incurred but which had not been booked due to the lag in billing. A complete review of all off-site contracts and several purchase orders was required to obtain data for these accruals.

All reports currently being issued by Technical Cost were reviewed and the forms revised where necessary to provide additional information in a more desirable form or to delete information which experience has shown can be obtained from other reports or is not needed at all. Near the end of July a review of report distribution lists was begun to give consideration to the several organizational changes which have been effected in Technical Section in recent months.

Preparation of the recast of the Budget for FY 1955 and Revision of Budget for FY 1954 continued in July as rapidly as required information could be obtained from Technical Section. Due to difficulties encountered in the dissolution of Laboratory Engineering and Facilities Unit the recast budget has been delayed to the point where no budget figures will be available for July cost reports.

Discussions concerning cost distribution problems encountered by the Analytical Laboratories Unit of Separations Technology Sub-Section resulted in a proposal to distribute costs on a standard rate per analytical determination in future months rather than the standard rate per hour worked as has been done in the past. It now appears that the new method of distributing costs will go into effect in September.

New procedures were reviewed and approved in July with regard to IBM handling of Accounts Payable Vouchers and Store Orders.

Preliminary discussions concerning new methods of cost accounting and inventory control for the Mechanical Development Shop were held in July by personnel of the Metal Preparations, Technical and Accounting Sections. An attempt is being made to improve the method of allocating material costs to work orders in the shop and to revise the method of liquidating shop costs to work orders to include both those cost recorded by Manufacturing Department-Metal Preparations Section and Engineering Department-Technical Section.

PROJECT COST

Construction Work in Progress-Engineering report for the month of June was furnished the Atomic Energy Commission on July 14, 1953. All other financial statements were issued on July 15, 1953 except the Management Booklet which was issued on July 22, 1953.

Work continued on the recasting of the Budget for FY 1955 and Revision of Budget for FY 1954 to reflect increased personnel and organizational changes. Recasting should be completed early in August.

During the month Project IR-133, Water Quality Laboratory Building 108-B, was closed to Plant Accounts, and Project CA-497, New Substation Fencing and Grounding of Fences, was closed to the Atomic Energy Commission upon completion of AEM portion of project.

Financial Closing Statements covering the following projects were issued during the month:

CG-442	X-Ray Machine - Building 3745-A
CG-454	Spectrometer Shielding

APPROPRIATIONS SECTION
MONTHLY REPORT - JULY, 1953

The following projects were approved by the Committee in July:

187-D, Rev. 6	Redox Production Facilities Part III, Waste Water Disposal Basin	Extension of time
CG-438, Rev. 2	Ball Third Safety System for 105 B, D, DR, F, and H	Extension of time
CG-477, Rev. 3	Building 284-W - Fifth Boiler Addition	Change of scope
CA-516, Rev. 1	1952 Hanford Expansion Gable Butte Railroad	Change in scope reduced cost to \$98,000
CA-525, Rev. 1	Permanent Auxiliary Combined Civil Defense and Plant Disaster Control Center	Change in scope reduced cost to \$50,000
CG-558	Reactor Plant Modification for Increased Production	Design funds only - \$100,000

Project proposals and informal requests approved by the Sub-Committee in July amounted to \$144,000, equipment amounted to \$79,725, for a total of \$223,725.

Department managers were requested to submit to the A & B Committee their recommendations for allocation of funds under budget item Improvements, Alterations, and Additions to Existing Plutonium Facilities. Preliminary review of the requests reveals that \$2,600,000 is our requirement for fiscal year 1954, with only \$1,800,000 available in the budget. A meeting is scheduled in August to allocate funds to departments based on priority lists of projects.

Funds for equipment not included in construction projects appear to be entirely adequate, amounting to about \$2,500,000 including \$200,000 carried over from fiscal year 1953.

PAYROLL UNIT
MONTHLY REPORT - JULY 1953

Reimbursement Authorizations No. 206 and No. 207 were issued in July by the Atomic Energy Commission covering the general salary increase effective June 10, 1953. Reimbursement Authorizations were also issued by the Commission in July covering new non-exempt classifications, "Financial Analyst" and "Standards Technician," and covering revision of the progression schedule for the non-exempt classification of "Dispatcher (Electrical)."

A considerable amount of preliminary work was done in July in connection with preparation for payment in August of the general salary increase effective June 10, 1953.

Salary data for professional scientific employees of Hanford Atomic Products Operation was furnished in July to Accounting Services Division, Payroll Services Section, Schenectady at its request. The salary data was requested in connection with the Los Alamos Scientific Laboratory national survey of professional scientific salaries. The determination of the professional employees of Hanford to be included in the survey was made by Salary Administration. Salary data for the employees selected was forwarded to Schenectady on forms provided by the Los Alamos Laboratory for the survey.

Surveys were conducted by Payroll personnel on Wednesday, July 8 and on Thursday, July 16, 1953, at the 300 Area badge houses to determine the time required by employees to punch time clocks at the close of the day shift. Results of the surveys were presented to Management for consideration in conjunction with a study of quitting time practices in the 300 Area.

Payroll Unit (continued)

STATISTICS

<u>NUMBER OF 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	8 690	2 294	6 396
Additions and transfers in	112	14	98
Removals and transfers out	(112)	(16)	(96)
Transfers from weekly to monthly payroll		2	(2)
Transfers from monthly to weekly payroll		(5)	5
Employees on payroll at end of month	<u>8 690</u>	<u>2 289</u>	<u>6 401</u>
 <u>Number at month-end - by Payroll classifications</u>		<u>July</u>	<u>June</u>
Bargaining group - HAMTC		3 467	3 453
- Building Services		69	68
- Two Platoon Firemen		44	45
- Hanford Guards		465	471
Other weekly - non-bargaining		2 400	2 404
Executive, administrative and operating		1 767	1 770
Professional		478	479
Total		<u>8 690</u>	<u>8 690</u>
 <u>Number at month-end - by departments</u>			
Engineering		1 570	1 560
Manufacturing		3 317	3 306
Plant Auxiliary Operations		2 134	2 155
Community Operations and Real Estate		463	448
Financial		332	334
Employee & Public Relations			
Technical Personnel		107	105
Other		109	114
Radiological Sciences		365	368
Medical		248	254
General		16	16
Law		5	5
Accountability		21	22
Property Management and Control		3	3
Total		<u>8 690</u>	<u>8 690</u>
 <u>OVERTIME PAYMENTS DURING MONTH</u>			
Weekly Paid Employees		\$54 469-a)	\$64 220-b)
Monthly Paid Employees		26 024-c)	27 680-d)
Total		<u>\$80 493</u>	<u>\$91 900</u>
 <u>NUMBER OF CHANGES IN SALARY RATES AND JOB CLASSIFICATIONS</u>		<u>1 813</u>	<u>2 049</u>

(a) Includes 5 weeks ended 7-26-53.

(b) Includes 4 weeks ended 6-21-53.

(c) Overtime worked during period June 1 through June 30, 1953.

(d) Overtime worked during period May 1 through May 31, 1953.

Payroll Unit (continued)

GROSS PAYROLL PAID DURING MONTH

	July	June
Engineering	\$ 811 796	\$ 774 196
Manufacturing	1 777 732	1 538 387
Plant Auxiliary Operations	983 332	829 686
Community Operations & Real Estate	205 687	177 856
Other	557 873	490 978
Total	<u>\$4 336 420</u> -a)	<u>\$3 811 103</u> -b)

ANNUAL GOING RATE OF PAYROLL

Base Plus Overriding Adjustment	\$43 801 226	\$43 714 209
Overtime	788 004	1 301 093
Isolation Pay and Area Differential	1 903 435	1 905 543
Shift Differential	548 363	547 455
Other	36	876
Total	<u>\$47 041 064</u>	<u>\$47 469 176</u>

AVERAGE HOURLY BASE RATES (Includes overriding adjustment)

Bargaining group - HAMTC	\$2.274	\$2.272
- Building Services	1.728	1.731
- Two Platoon Firemen	2.162	2.187
- Hanford Guards	1.974	1.974
Other Weekly - non-bargaining	1.934	1.931
Executive, administrative and operating	3.207	3.192
Professional	3.485	3.479
Total	<u>\$2.416</u>	<u>\$2.411</u>

AVERAGE EARNINGS RATE PER HOUR

	July -c)			June -c)		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	\$2.056	\$3.350	\$2.772	\$2.062	\$3.335	\$2.764
Manufacturing	2.518	3.392	2.690	2.511	3.376	2.678
Plant Auxiliary Operations	2.163	3.117	2.296	2.159	3.107	2.290
Community Operations & Real Estate	2.149	2.826	2.357	2.153	2.822	2.369
Other	1.979	3.551	2.377	1.968	3.539	2.361
Total	<u>\$2.272</u>	<u>\$3.325</u>	<u>\$2.546</u>	<u>\$2.269</u>	<u>\$3.311</u>	<u>\$2.538</u>

(a- Includes payments for five-week period ended July 26, 1953, in the case of weekly paid employees.

(b- Includes payments for four-week period ended June 21, 1953, in the case of weekly paid employees.

(c- Includes shift differential and isolation pay in the case of weekly paid employees and area differential in the case of monthly paid employees. Excludes overtime premiums, commissions, suggestion awards, etc.

Note - General salary increase effective 6-10-53 not included in the above statistics.

Payroll Unit (continued)

EMPLOYEE BENEFIT PLANS

Participation in Benefit Plans at Month End

	Number Eligible July	Number Participation July	Percent Participation July June	
Pension Plan	7 991	7 634	95.5%	95.4%
Insurance Plan				
Personal Coverage	8 684	8 683	98.9	98.8
Dependent Coverage	-	5 792	-	-
U. S. Savings Bonds				
Stock Bonus Plan	8 685	3 866	44.5	44.1
Savings Plan	8 685	981	11.3	11.2
Both Plans	8 685	4 414	50.8	50.1

Pension Plan

Number Retired	July 6	Total to Date 280-a)
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Aggregate Annual Pensions Including

Supplemental Payments

\$1 593	\$64 587-b)
---------	-------------

Amount contributed by employees retired

3 982	84 775
-------	--------

(a- Includes 15 employees who died after reaching optional retirement age but before actual retirement. Lump sum settlements of death benefits were paid to beneficiaries in these cases.

(b- Amount before commutation of pensions in those cases of employees who received lump sum settlement.

Number who became eligible for participation

July 78	June 157
------------	-------------

Number who applied for participation

73	145
----	-----

Number who elected not to participate

3	8
---	---

Replies not received

2	4
---	---

Normal Retirement Pension Applications

July 2	Year to Date 13
-----------	--------------------

Optional Retirement Pension Applications

3	9
---	---

Insurance Plan

Claims - Death Benefits -a)

Number

July 2	Total to Date 124
-----------	----------------------

Amount

\$19 500	\$763 013
----------	-----------

Claim Payments - Accident & Health Insurance

Number of Checks

July 1 619	June 1 639
---------------	---------------

Number of Claims

993	1 068
-----	-------

Amount of Benefits

\$ 84 736	\$ 86 249
-----------	-----------

Total benefits paid since December 1, 1950
to date

\$2 052 779	\$1 968 043
-------------	-------------

(a- Total to date includes all claims under the old and new Insurance Plans and 10 deaths on which accidental death benefits were paid.

U. S. Savings Bonds

Annual Going Rate of Deductions

G. E. Employees Savings

July	June
------	------

and Stock Bonus Plan

\$1 719 641	\$1 703 289
-------------	-------------

G. E. Savings Plan

502 721	491 592
---------	---------

Total

\$2 222 362	\$2 194 881
-------------	-------------

Payroll Unit (continued)

Employees Who Have Entered Military Service

	Total to Date				
	<u>Called to</u>	<u>Volunteered</u>	<u>Number</u>	<u>Number</u>	
	<u>Duty</u>	<u>for Duty</u>	<u>Reactivated</u>	<u>Resigned-a)</u>	<u>Net</u>
Reserve Officers	41	6	(6)	(1)	40
Enlisted Reserve	56	6	(23)	(2)	37
National Guard	6	-	(4)	-	2
Selective Service	81	-	(28)	(1)	52
Voluntary Enlistments	-	117	(4)	(4)	109
Total	<u>184</u>	<u>129</u>	<u>(65)</u>	<u>(8)</u>	<u>240</u>

(a- Employees who were removed from the roll to enter Military Service and subsequently had their continuous service broken.

Annuity Certificates (for duPont Service)

Number Issued

July

-

Total to Date

96

Suggestion Awards

Number of awards

87

2 200

Total amount of awards

\$2 040

\$44 885

Patent Award Payments

Number of award

July

-

Year to Date

3

Amount

-

\$75.00

PREFERENTIAL RATES

Number Eliminated (Net)

July

13

June

-

Number Currently in Effect

677

690

Military Allowance Payments

Number

July

3

Total to Date

64

Amount

\$995.67

\$23 176.46

INTERNAL AUDIT UNIT
MONTHLY REPORT
JULY, 1953

The work of summarizing and reporting physical inventories, made during the six months ended June 30, 1953, was completed during July. Physical inventory reports issued in July showed the following results:

<u>Inventory</u>	<u>Date of Count</u>	<u>Physical Inventory Value</u>	<u>Book Value</u>	<u>Overage (Shortage)</u>
Essential Materials	2-28-53	\$3 738 192	\$3 832 051	(\$ 93 859)
Stand-by Materials	3-25-53	2 317 840	2 295 901	21 939
Spare Equipment Held in Storage (plant account)	3-25-53	1 510 836	1 492 258	18 578
Overhead Line Materials	4-16-53	154 528	102 493	52 035
Communications Materials	4-17-53	40 675	-0-	40 675
General Supplies	4-30-53	813 573	785 221	28 352
Office Equipment (Non-capital)	4-30-53	50 674	35 431	15 243
Road Materials	5-21-53	28 498	25 118	3 380
Transportation Equipment Parts	5-21-53	201 181	165 616	35 565
Excess Materials & Equipment	6-10-53	4 484 419	2 698 146	1 786 273 -a)
Community General Supplies	6-24-53	50 844	25 277	25 567
Administrative Area Maintenance				
General Supplies	6-24-53	7 076	4 090	2 986
Railroad Materials	6-30-53	62 504	35 262	27 242

(a- Represents principally a write-up to acquisition values of materials and equipment previously booked at percentages of acquisition value varying from 5% to 100%.

During July, a survey of plant areas was made to determine those materials, not recorded in inventory accounts, which appeared to be in excess of normal shop stocks. Inquiries were made of section managers concerning disposition of such materials. The results of this survey will be reported to section managers.

Cash funds, totaling \$4,250 and representing approximately 70% of all authorized cash funds, were audited on July 21, 1953. Revenues, totaling \$29,077 and in the custody of various fund custodians, were counted and verified by accountability records. A report of the findings of this audit is being prepared.

In conjunction with the cash fund audit, the record of cash receipt books maintained by General Accounts was reviewed and the status of all books issued since the last review was determined.

PLANT PROTECTION SECTION

MONTHLY REPORT - JULY 1953

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	61	62	1 (a)	
Security and Patrol	526	521		5 (b)
Safety and Fire Protection	151	154	3 (c)	
Office Unit (Laundry and Building Services, Clerical and Records Control)	323	324	1 (d)	
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
TOTALS	1,063	1,063	5	5

(a) - Administration Area Maintenance

1 - New Hire

(b) - Security and Patrol

5 - Terminations

(c) - Safety and Fire Protection

4 - Transferred in
1 - Termination

(d) - Laundry and Building Services

2 - New Hires
2 - Reactivated
2 - Deactivated

Clerical Services

9 - New Hires
8 - Transferred out
2 - Terminations

SAFETY AND FIRE PROTECTION UNIT

Injury Statistics

	<u>JUNE</u>	<u>JULY</u>	<u>YEAR TO DATE</u>	<u>COMPARATIVE PERIOD, 1952</u>
Major Injuries	1	1	8	8
Sub-Major Injuries	0	1	9	15
Minor Injuries	357	350	2,425	2,661
Exposure Hours	1,404,671	1,469,000	10,155,077	10,293,460
Major Injury F/R	0.71	0.68	0.79	0.78
Major Injury S/R	0.02	0.002	0.035	0.057
Penalty Days:	0	0	75	375
Actual Days Lost	27	3	284	215
Minor Injury F/R	2.54	2.38	2.39	2.59
Estimated Medical Treatment Time Required	1,428 hours	1,432 hours	9,796 hours	10,764 hours

Industrial Fires

<u>Department</u>	<u>Area</u>	<u>No. of Fires</u>	<u>Cause</u>	<u>Loss</u>
Manufacturing Department	300	1	Combustibles too near heat or flame.	Nil
	300	1	Process	Nil
	300	1	Grass fire - probably cause burning pit.	Nil
	200-W	1	Burning & welding	Nil
	100-B	1	Burning & welding	Nil
	100-B	1	Flying embers from burning pit	Nil
Radiological Sciences	100-F	1	Cause unknown.	Nil
Engineering Department	100-B	1	Spontaneous ignition	Nil
	200-W	1	Burning and welding	Nil
No department charged	Outer	1	Lightning	Nil
	Outer	1	Smoking or matches	Nil
	700	1	Smoking or matches	Nil
	1100	1	Smoking or matches	Nil
TOTAL		13		Nil

Safety Activities

There was one major, one sub-major, one near-serious, and 350 minor injuries during the month. The injury trend shows a slight improvement.

An improvement in housekeeping is being experienced throughout the majority of the industrial areas. There is still room for improvement in four of the areas.

During this period, the Safety Unit was again required to furnish the AEC Safety Division excessive safety coverage on subcontractors' activities -- namely, Minor Construction, Blaw-Knox, Kaiser Engineering, Hoffman Construction, and subcontractors dismantling water towers in 200-E Area. This coverage consisted of expediting the correction of unsafe condition on work being done, and unsafe road conditions caused by their equipment; also, unsafe activities which affected GE employees; also, orientation type of conference in which the highlights of a safety program were described.

The 300 Area has set up a constructive activity on injury prevention which requires supervisors to get detailed information on all of their employees who have had three or more injuries during 1953. The injury files of our office in this area are supplying the requested information.

One of the new facilities in the 321 Building failed and resulted in acid fumes spill. This unsafe condition was corrected.

The second annual 300 Area "S" Day was carried out on June 26 and met with favorable comment.

A big improvement in the safe movement of traffic over the main industrial roads between 6:45 AM and 7:45 AM was observed during the last seven days of the month. This improvement consists of the removal of large chemical trucks (bottle-necking traffic on grades) and the policing by Industrial Patrol which has stopped cars, pickups and buses pulling out of line when exceeding allowable speed limits.

Noise level studies are being made in all areas.

Fire Protection Activities

Thirteen fires occurred in the plant that were chargeable to operations during the month, but no accountable loss was incurred. Twelve other fires were extinguished by the Fire Department. The most serious one to operations was started by embers from an Army burning pit and burned over 1,800 acres before it was extinguished. The power lines feeding the plant were endangered, but none were damaged.

Fire Protection Surveys were completed on Buildings 184-F, 221-U, 271-U, 276-U, 241-WR., 211-U and 291-U.

Three lectures and demonstrations were conducted with 52 employees attended.

A study and recommendation were made in connection with a job in the 105-DR Building which involved large quantities of acetone.

Fire extinguishing system for some hoods in the 234-5 and 222-S Buildings have been worked out and will be installed soon.

Purchase order has been issued for a fire detector system for 2704-Z Building in the 200-West Area.

The first large shipment of flame retardant paper for contamination control should be in Stores around August 10. It will be available in Stores for general use for contamination control in the future.

A study is under way for ways of improving the storage facilities for sodium nitrate. The green metal hutment in 200-West is being considered as a satisfactory building.

The fire alarm system's puncturing register and gong were moved to the temporary badge house in 200-E when the headquarters in that area were closed.

Work has now been completed on the installation of a proper valve on the large propane storage tank in the 300 Area. The vaporizer on this tank is still in question.

The machining equipment and raw material has been moved from the 101 Building to the new 2701-E Building.

Two bids for the fire alarm system in 100-K have been received. They are from B & B Engineering Corporation and the Gamewell Company. The B & B bid was a few dollars lower than Gamewell's. The B & B system is being investigated.

Plans were reviewed and recommendations made on the following projects: Transportation Consolidation, P-10 and the addition in 234-5 Building.

OFFICE UNIT

Laundry and Building Services

<u>200-West Laundry</u>	<u>June</u>	<u>July</u>
Pounds Delivered	220,978	183,622
Pounds Rewashed	4,761	6,040

Total Dry Weight	225,739	189,662
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Monitoring Group

Poppy Check - Pieces	195,513	177,749
Scaler Check - Pieces	204,235	225,205

Total Pieces	339,748	402,954
Rewash Pieces	4,693	5,967

700 Area Laundry

Flatwork - Pounds	34,764	42,615
Rough Dry - Pounds	26,405	28,854
Finished - Pounds	2,609	2,383

Total Weight	63,778	73,852
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Estimated Pieces	83,549	96,746
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Clerical Services

In cooperation with the Administrative Branch of the Atomic Energy Commission, the appearance of Cortez Peters, world's champion typist, was arranged for Secretaries A and B and selected personnel from the Atomic Energy Commission. This demonstration was made possible through the courtesy of the Royal Typewriter Company. The demonstration was held at the Community House and was entertaining and instructive to those who attended.

Effective this month the new rental service charge for office machines is in effect. This system provides for billing each user at a fixed rate for each office machine in use and will permit close control over the servicing operation through information furnished by the IBM machines being used to record and bill for these services.

Central Mail and Addressograph

The incoming postal mail remained normal during the past period but outgoing postal increased in volume. Inter-office mail was also up both in volume and weight.

The 760 Mail Room including two employees was transferred to the Central Mail. To accomplish this, mailboards were built and one hundred and seven mail stops were added to the existing two hundred and forty-two of Central Mail. Mail boards were all retyped and rearranged, runs were rescheduled and on Wednesday, July 29, the 760 Mail was distributed to the new bins on the 4:00 PM schedule and 8:15 AM schedule was dispatched from the 703 Building July 30, with uninterrupted service to the 760, 761 and 762 Buildings.

Addressograph work was above normal in volume due to the plant mailings, telephone directories and above normal volume for community and payroll work, also the new files for Transportation is a weekly repetitive operation bringing end of the month volume up.

One new file was added for the Engineering Department and all distribution lists for the Technical Information Library were transferred to the addressograph which required plate making, tabulation, etc.

All work on a current basis.

<u>Types and Pieces of Mail Handled</u>	<u>July</u>	<u>June</u>
Internal	1,670,566	1,671,043
Postal	86,107	75,002
Special	1,980	2,386
	<hr/>	<hr/>
Total Mail Handled	1,758,653	1,748,431
Total Postage Used	\$3,618.00	\$3,150.68
Total Tele types Handled	3,738	3,015
Total Store Orders Handled	418	407

<u>Addressograph</u>	<u>July</u>		<u>June</u>	
<u>Type of list</u>	<u>Number of Runs</u>	<u>Total Copies</u>	<u>Number of Runs</u>	<u>Total Copies</u>
Plant Name List	104	172,536	102	145,226
Housing List	20	78,210	16	69,642
Payroll List	12	54,308	11	30,846
Total New Plates	2,321		4,623	
Total Corrected Plates	1,182		967	
	<hr/>		<hr/>	
	3,503		5,590	

Office Equipment

Furniture

Requisitions have been issued for office equipment to fill construction contractors' requirements for the first six months of FY 1954. A request for appropriation number 54-C-3 was approved to procure these requirements.

Furniture for C-406 Project has been assembled for delivery during the first part of August.

Office Machine Repair

Fifty-one office machines were supplied to construction contractors during the month. These were used machines and each machine required some adjustments and parts which caused an increase in our routine shop repairs. However, all requests for service have been filled with very little delay.

A requisition for a maintenance service contract was issued to cover Burroughs and Pitney-Bowes machines.

Service calls and shop repair of office machines were steady during the month. No increase has been noted from monthly maintenance rental.

Office Machine Repair Shop in 100-K Area is in operation. Kaiser Engineers have given their full cooperation in getting this shop into operation. An air compressor was installed by them and will be used by our repairman to assist in dry cleaning machine.

Central Printing

While the number of printing orders received this month was 106 short of the number received the previous month, the dollar volume billed nevertheless exceeded last month's billing by \$16.97.

An unusually large number (35) of printing orders required gathering copies into sets and padding. The "Master Plan for Richland" which required 37 - 11 $\frac{1}{2}$ x 17" pages or composition was completed and 200 printed books were delivered to AEC Engineering and Construction Division on schedule.

The semi-annual Production Report and annual Inventory Report covering the Class "B" printing plant was completed during July and forwarded to the Atomic Energy Commission.

<u>Work Completed</u>	<u>July</u>	<u>June</u>
Orders Received	315	421
Orders Completed	303	382
Back Log	75	118
Copies Printed	1,487,462	1,563,329
Negatives Masked	931	762
Negatives processed	1,009	999
Photo Copy prepared	254	240
Litho Plates processed	977	743

Stenographic Services

Six new employees were assigned to Stenographic Services during the month; four classified as Stenographer-Typists and two as Stenographers. Eight transfers were effected during July and arrangements completed for six transfers early in August.

Requests for temporary assignments were heavy throughout the entire month. It was possible to fill forty-three of these requests for varying periods of time.

Training hours were high for the month due to the fact that eighteen new employees were received into the group between the middle of June and the middle of July. Actually, a greater number of employees were accepted than were needed in the group due to the fact that Employment has filled all open requisitions for locations in 700, 1100 and 3000 Areas which did not require "Q" Clearances. The balance of open requisitions require "Q" clearances for employees over 18 years who could work in the area. Employment's decision was that these stenographers should be put on the rolls now to await clearances -- and their eighteenth birthdays.

Overall work load continued heavy for the month with an increase of 908 hours over last month.

<u>Breakdown of Hours</u>	<u>July</u>	<u>June</u>
Machine transcription	19	6
Letters	17	40
Rough drafts	63.5	53.5
Duplimats, Xerography	199.5	244
Miscellaneous	437.5	433.5
Training Time	792.5	260.5
Meeting Time	31	3.5
Unassigned Time	84	167
Absenteeism	2	56
	<hr/>	<hr/>
TOTAL	1,646	1,264
Employees loaned to other Depts.	2,320	1,372
	<hr/>	<hr/>
TOTAL HOURS AVAILABLE	3,966	2,636

Area Mail & Duplicating

Work loads handled by Area Mail personnel continue to increase due to construction in 300, 200-East and 100-K Areas. Two mail stops also were added to the 200-West schedule this month. Uniform service is being provided to all areas. Simultaneously, a reduction in personnel has been effected.

On July 13 of this month, an Eastman Verifax Printer was installed in the 703 Duplicating office. The addition of this new process will provide much improved service on requests for a minimum number of copies. Tests made thus far have shown that copies can be obtained which closely approach photostat quality. However, the process produces copies much more rapidly and economically since the negative step is eliminated.

On July 6, the sound-slide film entitled "It's Just Knowing How" was presented to twenty-seven clerical and stenographic personnel in the Fire Station conference room, 200-West Area. This program of presenting informative meetings in each area on the project to familiarize clerical employees with the applications of offset duplicating and Xerography is being well received. Such meetings are reducing costs in labor and materials which were occurring when uninformed personnel improperly prepared copy for these processes.

<u>Duplicating & Mail Statistics</u>	<u>July</u>	<u>June</u>
Orders received	3,038	3,233
Orders completed	2,970	3,232
Orders on hand	68	57
Offset plates	14,533	17,685
Offset copies	794,778	917,672
Stencils	898	855
Stencil Copies	18,138	15,865
Ditto Masters	699	702
Ditto Copies	23,306	19,144
Xerox Plates	1,067	1,725
Verifax masters	5	--
Verifax copies	30	--
Total pieces internal mail	677,629	673,606

Records Control

Quantity of records received, processed and stored:

Employee & Public Relations Department	29	Standard Storage Cartons
Engineering Department	42	" " "
Financial Department	108	" " "
Law Department	1	" " "
Manufacturing Department	26	" " "
Medical Department	79 -	" " "
Plant Auxiliary Operations Department	107	" " "
Radiological Sciences	9	" " "
Sub-Contractor -		
Guy F. Atkinson & J. A. Jones Co.	7,176	" " "

TOTAL 7,577 Standard Storage Cartons

Persons provided records service: 1,519

Records Destroyed: 14 cartons

Records cartons issued: 449

Percentage of Records Service Center vault occupied by records if 100% plus excluding Civilian Defense Area.

Twenty-eight requests for file cabinets were received. Thirty requests were filled, two requests were cancelled, 21 requests for file cabinets are pending. Three fire proof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a savings of \$450.00 (\$225.00 cost of combination cabinet minus \$75.00 cost of key locked cabinet equals \$150.00 savings per cabinet exchanged). Twelve key locked cabinets were picked up with no exchange.

Uniform filing was established in seven offices during the month. A total of 432 offices have installed the filing system to date. Sixteen rechecks were made on established files.

Six Evaluations of Records for disposal were developed and submitted for internal departmental approval. Three Requests for Authorization for Records Disposal were approved by the Atomic Energy Commission.

Inventory, identification, boxing and labeling of Atkinson & Jones Company records was completed by Atkinson & Jones Company. There were 7,176 standard cartons of records transferred to custody of General Electric and are stored in Records Storage building in North Richland.

ADMINISTRATION AREA MAINTENANCE UNIT

CA-504 Lighting Improvements - 700 Area Buildings: Contract work started. Arrangements made for portion of electrical tie-ins. Steps taken to make minor revisions in 761-762 Building lighting, based on partition installation.

-- New Administration Building: AEC working on new appeal to Washington office for reconsideration of 700 Area Office Building. Assistance rendered AEC in providing photographs of crowded office conditions.

CA-525 Conversion of Basement, 5th Wing, 703 Building to Civil Defense Auxiliary Center: Work in progress. Portion of utility tie-ins completed.

AEC-114 New Transportation Facilities (AEC): Contractor started work on shops building and dispatcher's office.

-- Alterations 713 Building: Project proposal in process of preparation to remodel unused portion of building for IBM and Statistical operations.

AEC-111 Central Stores Warehouse: Portion of Hauserman partitioning installed in receiving area by Minor Construction forces. Contractor continuing work on 4th. bay. AEC Modification 4 extended completion date to September 14.

IR-147 Partitioning, 761 and 762 Buildings: Partitioning installation approximately 75% complete. Radiator installations to be made in August.

Clean-up of weeds and grass in 700 Area is practically completed.

First Aid Station formally opened in 713 Building on July 13.

Hutment 712-A is being held in temporary standby. East end section is still in use as conference room.

Portion of 712 Building formerly occupied by Civil Defense is being remodeled by Contractor who is installing Record Center shelving which has been stored in 714 Building.

It is planned to transfer 714 Building to AEC for disposition.

General Maintenance

Work involving renovation of 744 Building for Telephone and Radio Groups is nearing completion.

Plywood and masonite partitions are being removed and Hauserman partitions installed in 761-762 Buildings for better utilization of office space. Approximately 600 feet of Hauserman partition has been installed and 25 radiators will be installed for equalized heating.

Trolley duct was installed in 760 drafting room.

Installed 18 Smithcraft fluorescent fixtures, Room 2410, 703 Building, and 30 used fluorescent fixtures in 713 Building.

Twelve reel lights were replaced at 716 Garage.

Overhauled motor generator at Telephone Office and provided attic lights for 761 Building.

Overhead heat pipes were removed from vault, 703 Building, and radiators installed.

Desert coolers were installed on 744, 701-A and 760 Buildings.

Water service connections were provided for contractor in 5th wing basement of 703 Building, in connection with Civil Defense Center installation.

Three air vents were installed on compressed gas storage building at Central Stores to provide more adequate ventilation.

Overhaul of No. 1 boiler at 784 Heating Plant is approximately 60% complete.

No. 2 boiler was in service the entire month, with No. 1 undergoing annual overhaul. Numbers 3 and 4 boilers were in reserve, with some minor repairs remaining to be performed.

The quantity of steam generated at the 784 Heating Plant was 6.4% less than during July, 1952.

Arrangements were made for exterior inspection of 784 Heating Plant chimney, in connection with plant inspection now in progress.

On July 24, the new diversion line was placed in service at the 784-A Water Softener Plant. Wash and rinse water from the softeners will now normally be routed to the large secondary ash settling basin and thence to the storm sewer, with provision for rerouting this water to the sanitary sewer when required. It is expected that the heavy short duration flows will have an effective purging action on the storm sewer line to further aid a similar arrangement installed approximately a year ago at the 784 Heating Plant.

The first full month of operation of the Kadlec Hospital soft water line, following the revision in piping with the hospital, resulted in an average daily usage of 7,800 gallons as compared to 104,000 gallons during July 1952.

Coal Consumed:	483.60 net tons
Steam generated	7,254.3 M. lbs.
Steam leaving plant	6,166.2 M. lbs.
Steam delivered	4,658.1 M. lbs.
Total water softened	1,241,200 Gallons
Total soft water sent to Kadlec Hospital	245,080 Gallons
Total soft water sent to 784 Heating Plant	996,120 Gallons
Soft water served to Kadlec Hospital	744 hours.

SECURITY AND PATROL UNIT

Document Report

Number of classified documents unaccounted for as of July 1: (154 of the above 371 documents are chargeable to E. I. du Pont de Nemours & Co.)	371
Number of classified documents reported as unaccounted for during July:	7
Number of classified documents recovered during the month of July: (One of the above ten documents is chargeable to E. I. du Pont de Nemours & Co.)	10
Number of classified documents remaining unaccounted for as of August 1: (153 of the above 368 documents are chargeable to E. I. du Pont de Nemours & Co.)	368

Security Education

Six items appeared in the Works NEWS concerning the subject of Security.

There were 215 security meetings held and attended by 2,984 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 shown below:

"The Tallest Shadow" was shown at one meeting with 30 employees present.

"Signal 99" was shown at 12 meetings, each with an average attendance of 21.

"The Defense Rests" was shown at two meetings, each with an average attendance of 16.

"Only The River" was shown at two meetings, each with an average attendance of 19 employees.

"The Man on the Left" was shown at one meeting with 15 people present.

"Sabotage" was shown at one meeting with 26 employees in attendance.

"On Guard" was shown at one meeting with eighteen employees present.

"Fitting 'U' Into Security" was shown at one meeting with fifteen people present.

GE Security Bulletin No. 77 entitled "Communism in Industry" was distributed on July 24, 1953.

The latest security film made at Hanford entitled "The Tallest Shadow" was released during the latter part of this reporting period.

Two "Burma Shave" type signs had their slogans changed during the month of July. These slogans read as follows:

"Loose Talk
Could Cause
the Loss of
Free Speech -
SECURITY"

"Make Security
First
to Make
It
Last"

The following security posters were distributed and posted throughout the plant areas:

450 large and 200 bus size posters with the slogan "Secure Their Future"

200 posters supplied by the Munitions Board, Washington, D.C., bearing the slogan "Security is Everybody's Business".

The following "A-B-C" type security pamphlets were distributed to all operations personnel during July:

2,000 copies with the slogan "Do Not Discuss Classified Subjects on the Telephone".

2,000 copies carrying the slogan "Going Places This Summer?"

A memorandum was issued July 13 regarding the "Reclassification of 221-B Exclusion Area", in conjunction with reducing the status of this area from "exclusion" to "Limited".

Organization and Policy Guide No. 15.4 "Security Orientation of New Employees" was revised and issued July 6, due to the change in schedules of the security orientations which are being conducted.

Seventy-three employees of the General Electric Company received a "Q" security orientation talk from either a representative of Security or an Area Patrol Captain during the month.

Nine cases of employees of the General Electric Company were submitted to the Atomic Energy Commission for processing for emergency "Q" security clearance.

Statistical Report of Security Patrol Activities

	<u>100-B</u>	<u>100-D</u>	<u>100-F</u>	<u>100-H</u>	<u>200-E,W</u>	<u>300</u>
Pat Searches	93	112	90	102	192	1
Escorts	25	9	15	18	77	61
Ambulance Runs	3	0	2	1	6	4
Passes issued:						
One day temporary	93	20	10	11	62	153
Travel	8	0	0	39	0	81
Red Tag	307	116	15	35	651	154
Telephonic	2	3	0	1	0	8
Supervisors' Post Contacts	606	366	351	397	756	610

Other Security Patrol Activities: (Computed by Hours)						<u>300 &</u> <u>700</u>
Security File Check	80.5	306	340.2	443.5	461	1,564
Building Check	161.5	80.2			376	816

Other Security Patrol Activities:

Buildings and Doors opened	248
Railroad Gates Opened	279
Master System Keys Issued	75
Operation Gas Pumps	201

Arrest Report

<u>Violation</u>	<u>Number of</u> <u>Violations</u>	<u>Cont. Cases</u> <u>from June</u>	<u>Cases</u> <u>Cleared</u>	<u>Fined</u>	<u>Jailed</u>
Speeding	1	1	2	2	0
Public Intoxication	1	0	1	1	1
Driving while under the influence of intoxi- cating liquors	1	0	1	1	0
Operating Motor vehicle without driver's license	1	0	1	1	0
	<u>4</u>	<u>1</u>	<u>5</u>	<u>5</u>	<u>1</u>

Citation Tickets Issued: 4

Security Patrol Training

Security Patrolmen receiving classroom instruction during the month: 179

Security Patrolmen attending firearms training during the month: 229

The following training courses were conducted:

Safety Class	1/2 hour
Security Class	1/2 hour
Operations Class	1 hour
Firing of .38 cal. revolver	1/2 hour

Security Patrol Post Changes

Due to consolidation of the 200-E Area Security Patrol with 200-W Area on July 10, the following five posts were discontinued:

Supply and Ambulance	1 man - 24 hours
Radio	1 man - 24 hours
221-B Exclusion Area	1 man - 24 hours
200-E Building Check Car	1 man - 24 hours
Headquarters Clerk	1 man - 24 hours

On July 1, the 101 Area post was discontinued with five men involved.

The Yakima Barricade and Riverland Yards post, out of 100-B Area, was reduced from two men to one, due to having the Riverland post discontinued. The Building Check car for 100-B Area assumed the duties over Riverland.

Due to consolidation of the 200-E and 200-W Areas, the following new posts were established in these areas:

On July 10, the Exclusion Area Fence Car, 200-W	1 man, 24 hours
On July 24, the 2101 Vehicle Gate, 200-E Area	1 man, Day shift

Six men were assigned to posts for the 100-K Area and are being charged to Construction until August 10, 1953. These posts are known as:

Foot Patrol	Radio Operator
Security Patrol Rover, 105-KW	100-K Area Building Check Rover
Vehicle Patrol, 100-K Area	Vehicle Rover, 100-K River Road

A new post was established out of 100-H Area on July 2, known as the "Tube Shop, White Bluffs". One man on day shift is needed.

Field Inspection Activities

Contacts made to locate unaccounted for documents:	13
Searches conducted to locate unaccounted for documents:	7

General

Effective July 6, the position of "Captain, Security Patrol" was changed to "Duty Officer". There is one Duty Officer now assigned to each shift.

A survey was made July 17 of the positions at Hanford Atomic Products Operation to determine the positions that fall within the "sensitive position categories" as defined by criteria of the Atomic Energy Commission. The survey disclosed we have 190 positions that are sensitive. Personnel replacement for these positions must have Federal Bureau of Investigation investigation. All other positions are presently classed as non-sensitive and will require Civil Service Commission background investigation. Procedures are being established with Monthly and Weekly Salary Administration to meet the requirements in respect to these positions.

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HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING JULY 31, 1953

<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>

ENGINEERING DEPARTMENT - TECHNOLOGY SECTION

I. Visitors to this Works

W. T. Foote U. S. Atomic Energy Comm. New Brunswick Laboratory	Discuss Redox problems	D. P. Granquist	7-16-53	7-16-53	X	300 XXX
J. E. Hudgens, Jr. U. S. Atomic Energy Comm. New Brunswick Laboratory	Neutron spectrometry and plutonium technology	D. P. Granquist	7-9-53	7-9-53	X	300 XXX
N. E. Huston North American Aviation Co. Downey, California	Obtain information on reactor safety project and attend meeting on same	A. B. Carson	7-21-53	7-23-53	X	100-B 105-B, 105-C, 100-D 105 108-B 300 XXX
R. W. Lockhart Knolls Atomic Power Lab. Schenectady, New York	Information on problems of running experiments or tests in operating piles	L. P. Bupp P. H. Reinker R. B. Richards	7-9-53	7-17-53	X	100-B 105-B, 105-C 100-D 105, 189 100-F 105 100-H 105 300 XXX; 700
W. K. McCarty North American Aviation Co. Downey, California	Obtain information on reactor safety project and attend meeting on same	A. B. Carson	7-21-53	7-23-53	X	100-B 108-B 100-D 105 100-H XXX 300 XXX
E. R. Parker University of California Berkeley, California	Discuss general metallurgical problems associated with research on creep of alloys under contract AT-(11-1)-Gen.10	T. R. Nelson J. W. Riches	7-13-53	7-13-53	X	300 XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
N. P. Pinto Sylvania Electric Products Bayside, Long Island, New York	Collect information on "S" powder metallurgy slugs	E. A. Eschbach	6-29-53	7-2-53	X	100-B 105-B, 105-C 300 303; 700
P. R. Powell Los Alamos Scientific Lab. Los Alamos, New Mexico	Continue work on neutrino program	J. A. Berberet	7-28-53	8-10-53	X	100-B 105-B, 105-C 100-H XXX 300 XXX; 700
L. Smiley Sylvania Electric Products Bayside, Long Island, New York	Collect information on "S" powder metallurgy slugs	E. A. Eschbach	6-29-53	7-2-53	X	100-B 105-B, 105-C 300 303; 700
C. R. Smith North American Aviation Co. Downey, California	Obtain information on reactor safety project and attend meeting on same	A. B. Carson	7-21-53	7-23-53	X	100-B 108-B 100-D 105 100-F 105 300 XXX
D. R. Smith Los Alamos Scientific Lab. Los Alamos, New Mexico	Consultation on W-1 Contract; check counting and rectify differences on counting results between sights	A. E. Smith	7-21-53	7-23-53	X	100-B 105-C 100-D XXX 100-F 105 100-H XXX 200-W 234, 235 300 XXX; 700
G. R. Tatum Vitro Corporation of America New York, New York	Consultation on experiment	J. T. Stringer	7-16-53	7-16-53	X	300 XXX
J. R. Tinker E. I. du Pont de Nemours & Co. Wilmington, Delaware	Consultation on Savannah River Operations	J. C. L. Chatten	7-15-53	7-15-53	X	100-B 108-B
A. W. Travena Vitro Corporation of America New York, New York	Consultation on experiment	J. T. Stringer	7-16-53	7-16-53	X	300 XXX
J. Urban E. I. du Pont de Nemours & Co. Wilmington, Delaware	Consultation on Savannah River Operations	J. C. L. Chatten	7-15-53	7-15-53	X	100-B 108-B

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
M. P. Warren Los Alamos Scientific Lab. Los Alamos, New Mexico	Continue work on neutrino program	J. A. Berberet	7-28-53	8-10-53	X	100-B 105-B, 105-C 100-H XXX 300 XXX; 700
J. W. Zambrow Sylvania Electric Products Bayside, Long Island, New York	Collect information on "S" powder metallurgy slugs	E. A. Eschbach	6-29-53	7-2-53	X	100-B 105-B, 105-C 300 303; 700
II. Visits to other Installations						
R. W. Benoliel to: E. I. du Pont de Nemours & Co. Wilmington, Delaware	Consultation on metal quality	B. W. Dunnington	7-20-53	7-24-53	X	
J. O. Erkman to: Argonne National Lab. Chicago, Illinois	Obtain information on plastic scintillators	W. Buck	7-20-53	7-20-53	X	
W. T. Kattner to: Mallinckrodt Chem. Wks. St. Louis, Missouri	Metal quality discuss- ions and development of uranium fabrication techniques	W. M. Leaders C. H. Harrington	5-10-53	1-1-54	X	
W. T. Kattner to: Feed Materials Production National Lead Company Fernald, Ohio	Metal quality discuss- ions and develop- ment of uranium fabrication techniques	G. W. Wunder	7-20-53	1-1-54	X	
W. T. Kattner to: E. I. du Pont de Nemours & Wilmington, Delaware	Metal quality discussion & Co. and development of uranium fabrication techniques	B. W. Dunnington	7-20-53	7-25-53	X	
W. T. Kattner to: Argonne National Lab. Chicago, Illinois	Metal quality discussion and development of uranium techniques	F. G. Foote	7-20-53	1-1-54	X	
J. F. Music to: Battelle Memorial Inst. Columbus, Ohio	Consultation on proper ties of irradiated graphite	H. Z. Schofield W. A. Hedden	7-9-53	7-10-53	X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
W. J. Ozeroff to: Radiation Laboratory Berkeley, California	Discuss reactors	E. Teller	7-25-53	7-27-53	X	
W. C. Riley to: Battelle Memorial Inst. Columbus, Ohio	Consultation on properties of irradiated graphite	H. Z. Schofield W. A. Hedden	7-9-53	7-10-53	X	
M. J. Sanderson to: E. I. du Pont de Nemours & Co. Wilmington, Delaware	Discuss metal quality	B. W. Dunnington	7-20-53	7-25-53	X	
A. S. Wilson to: Knolls Atomic Power Lab. Schenectady, New York	Discuss fission product W. Alter chemistry	W. Alter	7-13-53	7-14-53	X	
A. S. Wilson to: Argonne National Lab. Chicago, Illinois	Discuss ruthenium chemistry work	J. C. Hindman	7-14-53	7-16-53	X	
J. R. Triplett to: Argonne National Lab. Chicago, Illinois	Information about reactor development program	J. M. West	7-1-53	7-3-53	X	
ENGINEERING DEPARTMENT - DESIGN SECTION						
C. A. Hansen, Jr., Knolls Atomic Power Lab. Schenectady, New York	Conference on thermocouples and radiation damage tests	E. S. Day, Jr.	7-9-53	7-10-53	X	100-B 105-C 300 303 700
T. M. Shepherd Knolls Atomic Power Lab. Schenectady, New York	Discuss procedures and technical problems on instrumentation	E. S. Day, Jr. W. B. Richards G. Gray E. Hilgemann	7-9-53	7-21-53	X	100-B 105-C 100-F 105 200-W Redox, 271-U 300 XXX; 700
N. F. Fuller General Engineering Lab. Schenectady, New York	Consultation concerning mechanical equipment for RMA Line	W. P. Ingalls	7-15-53	7-15-53	X	700 761

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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>
II. Visits to other Installations							
L. C. Koke to: American Machine and Foundry Brooklyn, New York	Inspect P-10 Dupont can foundry opening facility	J. E. Boretz R. W. Durante C. F. Casey H. W. Sandbury	7-6-53	7-7-53	X		
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visits to other Installations							
M. G. Patrick to: Gen. Eng. Laboratory Schenectady, New York	CA-431-C inspection and design liaison	E. S. Baker C. W. George	7-1-53	7-1-53	X		
H. H. Hubble to: Vitro Corporation of America New York, New York	Engineering consultation America Purex facility	J. C. Tourek	7-21-53	7-31-53	X		
M. R. Dempster to: American Machine & Foundry New York, New York	Inspect P-10 Dupont can opening facility	J. E. Boretz R. W. Durante H. W. Sandbury C. F. Casey	7-6-53	7-8-53	X		
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT							
I. Visitors to this Works							
M. W. Cook Radiation Laboratory Berkeley, California	Employment interview	D. W. McLenegan F. Clagett	7-14-53	7-15-53		X	300 3706
R. L. Hambley Aircraft Nuclear Propulsion Project Lockland, Ohio	Employment interview	P. A. Bundy	7-16-53	7-22-53		X	
II. Visits to other Installations							
F. Clagett to: Knolls Atomic Power Lab. Schenectady, New York	Discuss technical per- sonnel requirements and transfers	L. L. German	7-29-53	7-31-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
D. W. McLenegan to: Knolls Atomic Power Lab. Schenectady, New York	Discuss technical personnel requirements and transfers	L. L. German	7-29-53	7-31-53	X		
GENERAL							
I. Visits to other Installations							
W. E. Johnson to: Cal. Research & Development Livermore, California	Management discussion and inspection	F. Powell	7-1-53	7-1-53	X		
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
R. A. Ahrens Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100-Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
J. H. Christensen Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
M. Davis Knolls Atomic Power Laboratory Schenectady, New York	Establish training program for KAPL trainees	J. H. Warren E. P. Lee C. N. Gross	7-10-53	7-17-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
M. Duck Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. B. Lewis	7-13-53	9-5-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
T. J. Henry Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop	7-13-53	9-5-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105

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Name - Organization	Purpose of visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
W. R. Johnson Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
W. B. Leng Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
E. E. Kazmierczak Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
A. V. McKeon Navy Reactor Group Schenectady, New York	Training for responsi- bility of radiation protection for Submarine Intermediate Reactor for US Navy	P. C. Jerman L. V. Barker J. G. Myers	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 200-E 201-C 200-W 221-T, 221-U, Redox 300 303
J. J. Rasmussen Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
J. W. Richards Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
T. M. Shepherd Knolls Atomic Power Laboratory Schenectady, New York	Review local instrument problems and methods	R. C. Theil	7-10-53	7-10-53		X 100-B 105-C 100-F 105
J. W. Stacey Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data	
					Class.	Unclass. Areas
R. L. Teal Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
M. W. Tucker Navy Reactor Group Schenectady, New York	Training for responsibility of radiation protection for Submarine Intermediate Reactor for US Navy	P. C. Jerman L. V. Barker J. G. Myers	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 200-H 201-C 200-W 221-T, 221-U, Redox 300 303
L. M. Warner Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
J. M. Yankovich Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-13-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
G. L. Yeo Knolls Atomic Power Laboratory Schenectady, New York	Training and assistance in 100 Areas	J. W. Baker E. T. O'Sullivan W. N. Koop D. S. Lewis	7-6-53	9-5-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105

II. Visits to other Installations

S.M. Gill
to: Feed Material Production Center ing problems
National Lead Company
Fernald, Ohio

7-6-53 7-10-53

X

J. W. Green
to: E. I. du Pont de Nemours & Co. ing programs in Savannah River Plant
Savannah River Plant
Augusta. Georgia

7-12-53 7-15-53

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>
P. R. McMurray to: American Machine & Foundry Brooklyn, New York	Inspect P-10 Dupont can opening facility	J. E. Boretz C. F. Casey H. W. Sandbury	7-6-53	7-7-53	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
M. E. Ensminger State College of Washington Pullman, Washington	Consultation on biology problems	H. A. Kornberg	7-17-53	7-17-53	X		
E. A. Putzier Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Observe and discuss safety aspects of radiological work in 234-5 facility	H. M. Parker A. R. Keene	7-27-53	7-31-53	X	200-W 234, 235 300 XXX	
II. Visits to other Installations							
R. Borasky to: U. S. Atomic Energy Comm. Rochester, New York	Discuss electron microscopy of biological materials	M. L. Watson	7-6-53	7-7-53	X		
J. W. Healy to: The Rand Corporation Santa Monica, California	Attend conference sponsored by Rand Corp. on explosion of nuclear weapons	E. H. Flesset	7-21-53	7-23-53	X		
PLANT AUXILIARY OPERATIONS DEPARTMENT - PLANT PROTECTION SECTION							
I. Visitors to this Works							
W. J. Sheehy Aircraft Nuclear Propulsion Lockland, Ohio	Discuss document accounting Project procedures and security measures	T. B. Farley C. G. Stevenson	7-29-53	8-3-53	X	300-L XXX	
II. Visits to other Installations							
B. B. Evans to: Carbide & Carbon Co. Oak Ridge, Tennessee	Inspect decontamination laundry operations	M. V. Fermin	7-6-53	7-6-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
B. B. Evans to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Inspect decontamination Lab. laundry operations	R. L. Shehan	7-8-53	7-8-53	X		
PLANT AUXILIARY OPERATIONS DEPARTMENT - PURCHASING AND STORES SECTION							
I. Visits to other Installations							
H. J. Wolte to: Knolls Atomic Power Lab. Schenectady, New York	Discuss procurement problems	H. E. Scott	7-23-53	7-24-53		X	

Ja-25

RECEIVED

OFFICIAL USE ONLY

PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY - JULY 1953

It has been the practice of the Inland Steel Container Company to ship our steel drums in 3 small refrigerator cars in lieu of one 50 foot car. This practice cost us about \$100 additional on each shipment due to the extra switching involved and call-back of labor unloading crews. We advised the shipper to use 50 foot cars when possible and received assurance this would be done. This will result in a saving of approximately \$2400 per year.

The Interstate Commerce Commission granted the Railway Express Agency an increase in rates up to 20% effective August 20, 1953.

Gold end use certifications or a license to receive semiprocessed gold are not required of a contractor to A.E.C., according to a letter to H.A.P.O. by Mr. L. S. Howard, Acting Director to the U. S. Mint. This waiver resolves a problem which has caused considerable correspondence and inconvenience to our suppliers and ourselves.

Two requests for negotiation board studies were received. One from the Renegotiation Board, Boston, Mass., requested a complete review of procurement activity relative to Penberthy Injector Co. during the period specified. This study has been completed and forwarded. The other study requested by the New York City Renegotiation Board relative to General Chemical Division - Allied Chemical and Dye Corp., covering calendar year 1951, is now in process.

Nitric acid consumption continues at a very high level. All government owned stainless steel tank cars are now back in acid service, and our supply should continue to be adequate.

Our inventory position of steel sleeves for the 300 Area line is improving. Conferences between the vendor and General Electric Co. representatives have solved the majority of problems involved in production of satisfactory sleeves. Efforts are being made to develop other satisfactory sources for this item.

Requisitions for Project C-513-D have been received requesting October 1, 1953 delivery. It is doubtful that material can be received in this time, especially items of stainless steel as quantities requested are less than mill runs and we have been unable to find the material in warehouse stocks. It may be possible to use emergency stocks of stainless steel purchased by AEC. However, approval from AEC must be obtained prior to requisitioning on their warehouse. Every effort is being made to obtain the material as required.

Additional construction purchase orders which include operational spare parts were received. The total of 46 orders now on hand include 44 covering material for "K" Project and 2 for Purex. These represent an additional work load for the Standby sub-units in setting up appropriate records and in warehousing.

In addition to the special listing of stainless steel in Account 10.18, which was forwarded to interested parties in June, all stainless steel in Account 10.10-43 was listed in July for project screening in an endeavor to utilize as much of this material on project as possible.

PURCHASING AND STORES SECTION
SUMMARY

Eight formal excess lists totaling \$314,323 were transmitted to the Commission. The number of lists now awaiting disposition instructions by the commission total 116.

A proposed draft for the sale of buildings, material and equipment including railroad spurs in the 101 and Hanford Areas is in the hands of the commission.

Preparatory work is proceeding for installation of the uniform catalog numbering system for all CPFF contractors, for which the Stores Unit is coordinator. The assignment of numbers is complete for stainless steel, 75% complete on hardware and 50% on paint.

Material and equipment disbursed from inventories included the following:

General Supplies -----	(Account 10.2)	\$157,574.54
Standby Materials -----	(Account 10.1)	40,755.95
Spare Equipment Held in Storage---	(Account 29)	31,762.23
	Total	\$230,092.72

<u>Organization and Personnel</u>	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>
Employees on Roll	288	289	7 1

Effective July 1, 1953 the Automotive Parts function was transferred from the Transportation Section to this Section. This transfer increased forces by 13 employees thus offsetting reductions in other phases of operation.

PURCHASING AND STORES SECTION
AUDIT, PRIORITIES & CLERICAL UNIT
JULY 1953

Effective July 1, 1953 a change in the Contract Reporting System (Bulletin GM-S&S-34) eliminates the requirements for preparation and submission of Form AEO-328 for procurement actions between \$10,000 and \$25,000 in value. Form AEO-328 will now be required only for procurement actions of \$25,000 and over.

Gold end use certifications or a license to receive semiprocessed gold are not required of a contractor to the Atomic Energy Commission, according to a letter directed to Hanford Atomic Products Operation by Mr. Leland S. Howard, Acting Director to the U. S. Mint. This waiver resolves a questionable situation which has caused considerable correspondence and inconvenience to our suppliers and ourselves during the past four or five months.

Two requests for renegotiation board studies were received. One from the Renegotiation Board, Boston, Massachusetts regarding Penberthy Injector Company, requesting a complete review of procurement activity relative to Penberthy Injector Company during the period specified. This study has been completed and forwarded. The other study was requested by the New York City Renegotiation Board regarding our procurement activities, comparative prices, delivery information, etc., relative to General Chemical Division - Allied Chemical and Dye Corp., during calendar year 1951. This is in process.

Federal Power Commission acted favorably on a request for approval of facilities to increase the supply of natural gas available to National Carbon Co. for use in their performance on our Contracts G-5 and G-12.

Request was made to A.E.C. for a supplemental allotment of 100,000 lbs. of stainless steel required for special operations needs.

One vendor's representative was brought in to make adjustment on Filtered Water Drives.

The following table shows the dollar value of business, by cost category, and the number of procurement actions placed with different types of vendors. Dollar amounts are based on the net value of purchase orders and alterations as transmitted to A.E.C.:

<u>July 1953</u> Cost Category	VENDOR TYPE			
	Government Agency	Small Business	Big Business	Educational and other
\$0 - \$ 24.99	\$ 28.00	\$ 3,504.97	\$ 2,220.55	\$ 160.25
\$25 - \$ 499.99	652.82	77,479.66	44,323.62	329.53
\$500 - \$24,999.99		201,728.05	324,451.09	
\$25,000 - \$ Up		98,400.00	413,397.75	
	\$ 680.82	\$381,112.68	\$784,393.01	\$ 489.78
Number of Actions	11	1056	694	24

PURCHASING AND STORES SECTION
AUDIT, PRIORITIES & CLERICAL UNIT
JULY 1953

Requisitions on hand 7-1-53	<u>G</u>	<u>D</u>	<u>TOTAL</u>
Operations Procurement	844	0	844
Construction Procurement	0	122	122
A.E.C. Procurement	83	11	94
Total	927	133	1060

Requisitions Assigned during July			
Operations Procurement	1655	0	1655
Construction Procurement	0	223	223
A.E.C. procurement	390	50	440
Total	2045	273	2318

Requisitions Placed during July			
Operations Procurement	1833	0	1833
Construction Procurement	0	222	222
A.E.C. Procurement	269	38	307
Total	2102	260	2362

Requisitions on Hand 7-31-53			
Operations Procurement	666	0	666
Construction Procurement	0	123	123
A.E.C. Procurement	204	23	227
Total	870	146	1016

Purchase Orders Placed	<u>HW</u>	<u>HWC</u>
Operations Procurement	1461	
Essential Material	41	
Construction Procurement		170
Local Purchase	8	2
Total	1510	172

Value of Purchase Orders Placed		
Operations Procurement	\$ 380,221.67	
Essential Material	489,251.95	
Construction Procurement		\$ 281,267.42
Local Purchase	60.68	49.99
Total	\$ 869,534.30	\$ 281,317.41

Alterations Issued	<u>Increase</u>	<u>Decrease</u>	<u>No Change</u>	<u>Total</u>
HW Operations	44	30	6	80
Essential Material	4	3	1	8
HWC Construction	10	13	2	25
Total	58	46	9	113

Value of Alterations Issued	<u>Increase</u>	<u>Decrease</u>	<u>Total</u>
HW Operations	\$ 3,285.66	\$ 5,625.43	\$ 3,911.14
Essential Material	6,479.45	3,465.14	9,944.59
HWC Construction	17,310.12	2,049.36	19,359.48
Total	\$ 27,075.23	\$ 11,139.98	\$ 38,215.21

Government Transfers

OR
0

ORC
0

PURCHASING AND STORES SECTION
AUDIT, PRIORITIES & CLERICAL UNIT
JULY 1953

Vendor Contacts - - - - -	223
Claims Processed - - - - -	0
Damage Reports Processed - - - - -	7
Over & Short Reports Processed - - - - -	2
Accounts Payable Requests Handled - - - - -	364
Difference Slips Processed - - - - -	40
Clearance Slips & Purchase Order Change Approvals -	213
Material Exception Reports - - - - -	297
Return Orders Issued - - - - -	139

Shown below is a summary of the net value of procurement actions placed with vendors for manufactured or shelf items in the states of Washington, Oregon, Idaho and Other Areas.

<u>State</u>	<u>Manufactured</u>	<u>Shelf</u>	<u>Total</u>
Washington	\$ 600,685.17	\$ 135,950.43	\$ 736,635.60
Oregon	83,983.37	26,302.63	110,286.00
Idaho		114.07	114.07
Other	239,043.33	80,597.29	319,640.62
Total	\$ 923,711.87	\$ 242,964.42	\$ 1,166,676.29

<u>Organization and Personnel</u>	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>
Employees on Roll	31	29	-2

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
JULY, 1953

Although the number of assigned requisitions decreased 26% this month, the number on hand remained constant due to time required for processing, etc.

Funds were appropriated for Project C-513-D Conversion of the Hot-Semi Works. Requisitions for material for this project have been received requesting October 1, 1953 delivery. At the present writing it is doubtful that material can be received in this time, especially items of stainless steel, as quantities requested are less than mill runs and we have been unable to find the material in warehouse stocks. The emergency stainless steel stocks purchased by A.E.C. are now available and it may be that these emergency stocks for this conversion can be used. This emergency stock is Type 347 stainless steel and approval from A.E.C. must be obtained prior to requisitioning on their warehouse. Every effort is being made to obtain the material as required.

HWC 12192, Apex Steel Corporation - the R.O.P. submitted to the A.E.C. for \$10,000 reduction has been returned unapproved with the recommendation that the claim be reopened and the amount increased to \$20,000 reduction.

Organization and Personnel

	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>
Employees on Roll	12	12	0

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
JULY -- 1953

Statistical and General

Nitric Acid consumption continues at a very high level. All government-owned stainless steel tank cars are now back in acid service, and our supply should continue to be adequate.

Our inventory position in steel sleeves for the 300 Area line is improving. Conferences held by Manufacturing, Inspection, Operations Procurement, and the vendor have solved the majority of the problems involved in the production of satisfactory sleeves. We are continuing in our efforts to develop other satisfactory sources for this item.

Essential Materials contracts in process are as follows:

- (1) Rock Salt -- approved by the Commission and in force.
- (2) Sodium Carbonate -- approved by the Commission and in force.
- (3) Tributyl Phosphate -- approved by the Commission and in force.
- (4) Ferrous Ammonium Sulphate -- modification approved by the Commission and in force.
- (5) Liquid Carbon Dioxide -- contract negotiated, approved by General Electric and the Commission, and in force.
- (6) Methyl Isobutyl Ketone -- contract being negotiated with successful bidder.
- (7) Steam Coal -- original bids rejected by the Commission; new requests for quotation approved by the Commission and sent to prospective vendors; new bids received, analyzed, and records of purchase submitted to the Commission for approval.
- (8) Sodium Bismuthate -- modification to present contract being negotiated for increased quantity.
- (9) Sodium Dichromate -- modification to present contract being negotiated for increased quantity.
- (10) Chlorine -- modification to present contract being negotiated for increased quantity.

Organization and Personnel

	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>
Employees on roll	33	32	- 1

PURCHASING AND STORES SECTION

STORES UNIT

JULY 1953

Statistical and General

Additional construction purchase orders, which include operational spare parts, were received in the Standby Material Records Sub-Unit. The total now on hand is 46; 44 covering material for "K" Project and 2 for Purex.

A total of 419 Stock Adjustment Requests covering assignment of departmental responsibility for Standby items were returned by the field.

Four Declarations of Excess and one Property Disposal Report were prepared with a total dollar value of \$27,611.67 in Standby items.

The quantities of excess material received from Kaiser Engineers were larger than in past months.

Declaration of excess and transfer of railroad material from Willa has been completed.

In addition to the special listing of stainless steel in Account 10.18, which was forwarded to interested parties in June, all stainless steel in Account 10.10.48 was listed in July for project screening in an endeavor to utilize as much of this material on project as possible. One employee has been assigned on an almost full-time basis to assist in this program.

Eight formal excess lists totaling \$314,323 were transmitted to the Commission. The number of lists now awaiting disposition instructions by the Commission total 116.

A proposed draft for the sale of buildings, material, and equipment including railroad spurs in the 101 and Hanford Areas is in the hands of the Commission.

Comments from representatives of various firms are still favorable regarding the lotting and presentation of surplus material for sale.

In order to exercise better control of government owned containers and returnable containers, an employee has been assigned full time to an audit of this activity.

Preparatory work is proceeding for installation of the uniform catalog numbering system for all CPFF contractors for which the Stores Unit is coordinator. The assignment of numbers is complete for stainless steel, 75% complete on hardware and 50% on paint.

Materials and equipment disbursed from inventories included the following:

General Supplies -----	(Account 10.2)	\$ 157,574.54
Standby Materials -----	(Account 10.1)	40,755.95
Spare Equipment Held in Storage	(Account 29)	<u>26,203.98</u>
Total		\$ 224,534.47

PURCHASING AND STORES SECTION
STORES UNIT
JULY 1953

In surplus materials the following items are reported:

Disbursements by Store Order -----	\$ 47,316.99
Disbursements by Transfer -----	1,476.00
Offsite Shipments Billed -----	121,209.52
Property Disposal Report -----	1,950.61
Receipts of Surplus Material -----	244,125.16

Organization and Personnel

	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>
Employees on Roll	201	203	2

Effective July 1, 1953, the Automotive Parts function was transferred from the Transportation Section to the Stores Unit. This transfer increased the Unit's forces by 1 supervisor and 12 non-exempt employees thus offsetting reductions in other phases of operation.

PURCHASING & STORES SECTION

TRAFFIC UNIT

July, 1953

STATISTICAL AND GENERAL

The Transcontinental Motor Carriers have lowered their class rate arbitraries to equalize with the Carloading companies. This results in a competitive rate basis between the truck and carloading companies on most shipments from Eastern territory.

It has been the practice of the Inland Steel Container Company at Chicago, Illinois to ship our steel drums in three small refrigerator cars in lieu of one 50 foot car. This practice cost us about \$100.00 additional on each shipment, due to the extra switching involved and to the extra call-back of labor unloading crews. We advised the shipper to use 50 foot box cars when possible, and received assurance that it would be done. This will result in a savings of approximately \$2,400.00 per year.

The Interstate Commerce Commission has granted the Railway Express Agency an increase in rates up to 20%. The increased rates will become effective August 20, 1953.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of July amounting to \$2,938.41. This makes a total savings from September 1, 1946 to date of \$1,748,050.25.

Savings Report

1. Rate reductions obtained from carriers:

<u>Commodity</u>	<u>Origin</u>	<u>Savings for July, 1953</u>	<u>Savings from 9-1-46 thru June, 1953</u>	<u>Savings from 9-1-46 to date</u>
Extrusions, Aluminum	Edgewater, N.J.	\$ 383.14		
Extrusions, Aluminum	Phoenix, Ariz.	23.89		
Lead	Seattle, Wash.	31.37		
Limestone	Delle, Utah	640.00		
Phosphoric Acid	Newark, Calif.	410.96		
Silicate of Soda	Tacoma, Wash.	367.69		
Sulfamic Acid	Grasselli, N.J.	889.44		
Sulphate of Soda	San Francisco, Calif.	191.92		
		<u>\$2,938.41</u>	<u>\$1,745,111.84</u>	<u>\$1,748,050.25</u>

2. Freight Bill Audit	1,787.27	111,440.79	113,228.06
3. Loss & Damage & Over-charge claims	1,408.02	127,052.35	128,460.37
4. Ticket Refund Claims	429.22	31,832.22	32,261.44

PURCHASING & STORES SECTION

TRAFFIC UNIT

July, 1953

Savings Report (cont.)

5. Household Good Claims	\$ 18.36	\$ 17,258.23	\$ 17,276.59
	\$6,581.28	\$2,032,695.43	\$2,039,276.71

Work Volume Report

Reservations Made	Rail	20
	Air	98
	Hotel	97
Expense Accounts Checked		162
Household Goods & Automobiles	Movements Arranged Inbound	1
	Movements Arranged Outbound	1
	Insurance Riders Issued	2
	Claims Filed	1
	Claims Collected - Number	1
	Claims Collected - Amount	\$18.36
Ticket Refund Claims	Filed	36
	Collected - Number	24
	Collected - Amount	\$429.22
Freight Claims	Filed	12
	Collected - Number	11
	Collected - Amount	\$1,408.02
	Over and Shorts Processed	11
	Damage Reports Processed	6
Freight Bill Audit Savings		\$1,787.27
Freight Shipments Traced		65
Quotations	Freight Rates	197
	Routes	234
Bills Approved	Air Express	13
	Boat	1
	Carloading	62
	Express	182
	Rail	205
	Truck	231
Carload Shipments	Inbound	198
	Outbound	3

PURCHASING & STORES SECTION
TRAFFIC UNIT
July, 1953

Report of Carloads Received

<u>Commodity</u>	<u>CMSTF&P</u>	<u>NP</u>	<u>UP</u>	<u>Total</u>
Acetic Acid			1	1
Aluminum Ingots			1	1
Aluminum Sulphate	3	2	2	7
Ammonium Silicofluoride			1	1
Anhydrous Hydrofluoric Acid	1			1
Anthracite	1			1
Asphalt	1	1	1	3
Bichromate of Soda	1			1
Building Paper			1	1
Caustic Potash		1		1
Caustic Soda	18	21	5	44
Chlorine	3	1	2	6
Coal	16		36	52
Ferric Sulphate	2	1	2	5
Furnace Liners		8	5	13
Lead, Bar		1		1
Lime	1	1	1	3
Lime Rock	1		1	2
Machinery		1		1
Methyl Isobutyl Ketone		1	1	2
Naptha		1		1
Nitric Acid		10	12	22
Paint			2	2
Phosphoric Acid			1	1
Silicate of Soda	1	2		3
Soda Ash	1	1	1	3
Soda Sulphate	1			1
Steel Containers	1	1		2
Steel Pipe	3	1		4
Steel Tank		2		2
Sulfamic Acid			1	1
Sulphuric Acid		1		1
Merchandise		6	2	8
	<u>55</u>	<u>64</u>	<u>79</u>	<u>198</u>
Organization & Personnel	<u>6-30-53</u>	<u>7-31-53</u>	<u>Change</u>	
	11	11	0	

U. S. ATOMIC ENERGY COMMISSION
HANFORD OPERATIONS OFFICE
RICHLAND, WASHINGTON

55-407

DATE: June 16, 1955

TO: BUDGET

Subject: NOTICE OF CHANGE IN CLASSIFICATION

Notice has been received from the General Electric Company Non-Technical Document Review Board, Hanford Atomic Products Operations, Richland, Washington covering the following change in classification action effective March 10, 1955.

Hanford Document No. 51632 G. E. Document No. GE-20004-1

Doc. Date 8-18-53 Original Classification Restricted

Title or Subject: Transportation Section Monthly Report- July 1953

Author(s) or Originator W. F. Rice

Pgs 10-1 thru 10-8 (☒) Downgraded to Official Use Only
(☐) Classification Cancelled

According to our records you have copy(ies) 2 of 12 Series

INSTRUCTIONS.

Block out all present classification markings, which may be inconsistent with the changed classification indicated above, and re-mark in accordance with existing AEC Security Regulations.

REMARKS: This action applies only to the Transportation Section portion of Doc. GE-20004 and does not affect the classification of other parts of the report.

This document was transmitted to you 6-22-55
from Hanford on
Registry No.

LEE E. SPEER, Chief
Classified Document Control

DECLASSIFIED

**TRANSPORTATION SECTION
MONTHLY REPORT
July 1953**

Classification Cancelled or Changed to
By authority of THE GENERAL ELECTRIC COMPANY, NON-TECHNICAL DOCUMENT REVIEW BOARD. JOY E. JAYNES, Secretary.

GENERAL

Transportation Section personnel forces decreased from 525 to 507 by 9 new hires, 2 transfers in, 1 reactivation - personal illness, 3 terminations, 25 transfers out and 2 deactivations - personal illness. Thirteen of the transfers out were in connection with the transfer of the automotive and heavy equipment repair parts function to the Stores Unit on July 1.

Transportation Section operating costs for FY 1953 totaled \$3,914,258 and were approximately 3.38% under the budget.

Since the completion of recent physical inventories, considerable effort has been devoted toward improved inventory handling through the establishment of uniform procedures, full document control, and personnel education. This work is being performed in collaboration with Inventory Accounting and three of the five Transportation Section Inventories are fully operative under revised procedures. The two Road Material Inventories have been consolidated under 10.2-930 and will be placed under the new procedure following the resolving of certain details between Inventory Accounting and the General Cost Unit. The remaining 10.13 Fuel and Lubricants Inventory should be in progress next month, at which time consideration will be given to the prenumbering and registering of store orders and daily service station reports by locations. This will complete the compliance with the recommendations set forth by the Internal Audit Unit.

Satisfactory progress continued on the New Consolidated Transportation Facilities as site grading was begun on July 14 with Phase I of construction scheduled for completion by March 1, 1954. Reviewed plans and specifications for Phase II and submitted corrective revisions and/or comments to the Contact Engineer.

RAILROAD ACTIVITIES

Commercial cars handled during July decreased 52.4% over June due to the annual coal miners' holiday and subsequent curtailment of coal shipments. Additional vacations were scheduled during this period of reduced activity so that it was not necessary to lay off any train crews. The following recapitulation indicates the distribution of commercial cars handled.

<u>Carload Movements</u>	-	<u>Loads In</u>	<u>Empties In</u>	<u>Loads Out</u>	<u>Empties Out</u>
General Electric Company		325	14	13	379
Blaw-Knox		37	-	-	36
Grove-Shepard-Wilson-Kruege		2	-	-	2
Haughton Elevator Co.		3	-	-	3
J. P. Head		1	-	-	1
L. H. Hoffman Co.		1	-	-	1
Irwin Construction Co.		2	-	-	2
Kaiser Engineers		87	-	1	99
Steel Construction Co.		21	-	-	21
Scule Steel Co.		6	-	-	6
U. S. Army		6	1	1	6
A.E.C. Kaiser Engineers		<u>117</u>	<u>-</u>	<u>-</u>	<u>103</u>
		608	15	15	659

DECLASSIFIED

Transportation Section

Process service continued on an upward trend as actual cars handled increased 25.5% over June and required 254 man-hours of overtime.

Completed the special shuttling of cars between the 101 Building, Hanford, and the 2101 Building, 200-East, that was begun on May 27.

Total car movements including process service totaled 1,726 in July compared to 3,275 in June; 2,617 in May; 2,278 in April; 2,314 in March; 2,691 in February; and 2,730 in January.

Developed revised car handling rates to be effective July 1 for the equitable liquidation of railroad costs between process and commercial service. This means a major change in the rate for process cars from \$60 to \$155 since the former rate did not provide for any portion of the track or equipment maintenance costs. Rates for commercial cars will be benefited accordingly with a marked decrease in the handling charge per ton of coal for the Manufacturing Department because of the volume operation.

Re-railed one acid car at the 221-U Building, 200-West Area, on July 2 and one car of steel in the 100-K Area on July 1.

Completed premax compression tests on all 120-ton diesel electric locomotives. The compression on locomotive 39-3730 was found to be low and the engine was dismantled for repairs. New rings are to be installed, valves ground, and one replacement pin has been ordered.

Replaced a broken oil line and one bearing on locomotive 39-3731 following a drop in oil pressure while working in the field. Inspected all other main bearings and journals except the thrust bearing.

Repairs to the railroad trackage, damaged by the derailment of four runaway cement cars from the Central Mix Plant on June 2, are approximately 90% complete. As a further safety measure, a second derailer has been installed on this track near the Central Mix Plant to prevent a possible recurrence of such an incident.

Approximately 5,100 feet of the new Purex track and 2,900 feet of the 241-SX temporary track were inspected and placed in service.

The sorting, loading, and hauling of excess railroad material from the Hanford Rail Yard and Station Willa to the 3000 Area is approximately 70% complete. This involved twenty truck loads and two car loads or approximately 250 tons, and required 740 man-hours.

Routine track maintenance activities included lining, surfacing, and dressing of trackage requiring 4,285 man-hours; installation of ties, rail, and other track materials requiring 459 man-hours; removal of sand and oiling switches requiring 238 man-hours.

Transportation Section

DECLASSIFIED

AUTOMOTIVE ACTIVITIES

The Plant Bus System transported 6.9% fewer passengers in July than in June. The following statistics indicate the magnitude of service rendered:

Passenger volume	131,302
Revenue - bus fares	\$ 6,565.12
Earnings - transit advertising (June)	\$ 260.69
Bus trips	6,372
Bus miles - passenger carrying	191,479
Passenger miles	4,745,322

The following is a comparative breakdown of average daily round trips to the Plant Areas:

Passenger buses - 100-B	11
Passenger buses - 100-D	12
Passenger buses - 100-F	11
Passenger buses - 100-H	8
Passenger buses - 100-K	4
Passenger buses - Hanford	1
Passenger buses - 200-West	31
Passenger buses - 200-East	5
Passenger buses - 300 Area	6
Passenger buses - Riverland	2
Passenger buses - White Bluffs	1
Passenger buses - North Richland	4
700-300 Area Shuttle	16
Inter-Area Passenger Shuttle & Express	2

Effective July 6, bus service was established for the 100-K Area on the regular schedule for the 100 Areas. The present service is being provided on the day shift only, Monday through Friday.

Effective July 21, special bus service was established for the 2101 Building 200-East Area on the construction forces work schedule for the day and swing shifts. This service was necessary because of operational personnel working in conjunction with construction forces on this facility. Around-the-clock service Monday through Saturday is scheduled for August 3.

The Richland Bus System transported 17% fewer passengers in July than in June. The following statistics indicate the volume of service rendered:

Total passengers including transfers	8,208
Revenue - bus fares	\$ 633.46
Earnings - transit advertising (June)	\$ 12.87
Bus trips	1,149
Bus miles - passenger carrying	6,090
Passenger miles	25,853

The Atomic Energy Commission advised that subsidy funds for the Richland Bus System have been increased from \$14,000 to \$34,000 which should permit continued operation through FY 1954.

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Transportation Section

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Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 76 which were rendered to the following locations as indicated:

Benton City, Washington	8
Finley, Washington	1
Grandview, Washington	1
Hinkle, Washington	7
Kennewick, Washington	5
Pasco, Washington	35
Pendleton, Oregon	8
Prosser, Washington	2
Spokane, Washington	1
Sunnyside, Washington	4
Yakima, Washington	4

The following tabulation indicates the volume of Drivers Test Service rendered:

Applicants: Male	43	Number tests given	48
Female	5	Number rejected	0

Permits issued: Limited to driving with glasses	11
Unlimited	37

Permits reissued: Rehires	20
Expirations	230

The following tabulation indicates the volume of fuel distribution by Equipment Maintenance personnel:

	<u>Gasoline</u>	<u>Diesel Fuel</u>	<u>50 Cetane</u>	<u>Kerosene</u>	<u>White Gas</u>
Stock at start of month	53,110	24,290	17,400	1,230	197
Received during month	101,120	25,400	24,400	816	0
Dispensed during month	102,705	27,800	25,200	966	7
Stock at end of month	51,525	21,890	16,600	1,080	190

The following tabulation indicates the volume of inspection and maintenance service rendered to Hanford Atomic Products Operations automotive and heavy equipment by Equipment Maintenance personnel:

Motor overhauls	42
Class A Inspections and Repairs	113
Class B Inspections and Lubrications	1157
Bi-weekly Inspections - buses	123
Other routine maintenance repairs and service calls	2065
Accident repairs and paint jobs	27
Tire repairs	603
Wash jobs	558
Total	4688

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Transportation Section

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The following tabulation indicates the Plantwide usage of automotive equipment:

<u>Code</u>	<u>Type</u>	<u>No. of Units</u>	<u>Total Mileage</u>
1A	Sedans	338	662,292
1B	Buses	100	260,533
1C	Pickup Trucks	460	334,755
1D	Panel, Carryall, Sta. Wagon	129	173,841
1E	Armored Cars	2	213
1G	Jeeps	2	1,217
68 Series	Trucks	207	185,920
		1,238	1,618,771

Major heavy equipment repairs were made on six caterpillar units, one fork lift, and one welder.

Completed the installation of a Brooks Load Lugger on truck 68B-4637 for the 200 Areas.

The installation of dual axles under trailer 64-2750 for the 300 Area is approximately 75% complete.

Following considerable difficulty with regulated cranes 17T-3021 and 17T-3023 in the 200-West Area, it was decided to make a comprehensive inspection and order necessary parts to place them in good operating condition. It was found that both differentials were out of 17T-3021 and this unit is now on the regulated slab awaiting receipt of necessary parts so that repairs can be completed during August.

Truck 68B-8379 has been equipped with a hydraulically operated aerial platform by an outside contractor for the Electrical Distribution and Telephone Section. This unit will be ready for service following the installation of certain safety features.

Received twenty new sedan delivery trucks on July 28. The four remaining units are expected on August 3 and all units should be placed in service during the month.

Prepared a special report on the equipment not budgeted for in construction projects for FY 1954 which included the following:

1. Revised FY 1954 Equipment Budget segregated by quarters
2. Priority list of major equipment requirements
3. Appropriation Request information
4. Equipment to be procured from the Construction Pool when available

Completed the transfer of the 10.2-11 and 10.1-84 Inventories of automotive and heavy equipment repair parts back to the Stores Unit on July 1 as scheduled. Representatives of Inventory Accounting, General Cost Unit, Stores Unit and the Transportation Section met on June 29 to resolve procedure details relative to the application of the 40% handling charge; method of computing turnover ratios; use

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Transportation Section

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and control of documents for transferring materials between inventories. A subsequent agreement was reached on July 8 to continue handling rebuilt parts as in the past.

Made arrangements with the Stores Unit and the Atomic Energy Commission to procure an available supply of surplus antifreeze for the coming season. This material will only cost about \$1.20 per gallon whereas the normal average price has been \$1.80.

Two additional DC vehicles have been authorized to receive maintenance service thus increasing the total to 23 units of which 18 are assigned to the 700 Area Motor Pool.

Prepared an informational report on the method of filing equipment repair orders and restated our recommendation of a three year retention period. This would permit the disposal of all retired records that are over three years old without regard to the equipment status. Retired records would be stored a maximum of two years in the Records Center, whereas they now date back to September 1, 1946.

Sales of fuel to equipment totaled \$152,624 during the last half of FY 1953 while labor expenditures amounted to \$32,247, or approximately 21% handling charge. Miscellaneous sales chargeable to work orders for weed control, heating, etc. totaled an additional \$12,637.

Furnished Kaiser Engineers with a store order for \$1,809.64 to cover the repair parts that were received with crane 17-10657 on a government cost transfer from Arco, Idaho. This action was necessary to credit their inventory and debit 25 Construction Work In Progress, .5 Plant Auxiliary Operations Department, Request for Appropriation 53-S-3. This method of handling was informally requested by the Atomic Energy Commission and had the concurrence of the General Cost Unit and Plant Accounts.

Developed revised rental rates to be effective July 1 for the liquidation of heavy equipment maintenance costs. Rate increases average approximately 12% for heavy equipment and 15% on light equipment. The new rates are expected to provide an increase in revenue of \$178,626 which is the equivalent of the \$119,658 deficit in FY 1953 and the budgeted increase of \$58,968 in FY 1954.

Completed a cost study on the performance record of automotive vehicles equipped with speed governing carburetor plates versus non-governed units. The governor equipped units operated at an average cost per mile of 3.680¢ or approximately 22% less than the 4.715¢ for the non-governed vehicles. Marked savings were realized from lower per mile expenditures for repair labor, repair parts, and tires and tubes. The cost reduction of 1.035¢ per mile is quite significant in view of the reduced expenditure from governor equipped units as applied to FY 1953 costs approximates \$100,000. Copies of this study and related information were transmitted to the Atomic Energy Commission on July 29 in accordance with their request.

Initiated a utilization study on the equipment served by the Richland-Outer Area Parking Lot Motor Pool.

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LABOR ACTIVITIES

The following tabulation indicates in gallons the volume of road asphalt material handled by Road Maintenance personnel:

	<u>MC-1</u>	<u>MC 3</u>	<u>MC 4</u>	<u>MC 5</u>
Stock at start of month	0	10,072	0	41,633
Received during month	0	9,508.5	0	18,781
Used during month	0	12,805	0	53,514
Stock at end of month	0	6,775.5	0	6,900

The following tabulation indicates the volume of road aggregate materials handled by Road Maintenance personnel:

	<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	7.5	56	1,733	7,411	3,328
Made during month	908	265	0	0	0
Used during month	516.5	214	1,633	710	1,397
Stock at end of month	399	107	100	6,701	1,931

Completed a single, non-skid seal application on 12 miles of roadway from the 200-East "Y" toward Benton City. This required 33,085 gallons of MC 5 oil, 1,307 cubic yards of 5/8" chips, 78 cubic yards of 1/2" chips, and 651 man-hours.

Maintenance of primary roads required 295 man-hours; Manufacturing Area walkways, parking areas, and related work 136 man-hours.

Miscellaneous labor and equipment services for 300 Area required 862 man-hours.

Movement of equipment and material and other miscellaneous labor services for the 100 and 200 Areas required 288 man-hours.

Seal coated a parking lot at Kadlec Hospital requiring 1,300 gallons of MC 5 oil and 65 man-hours.

Completed the moving of the Electrical Distribution Pole Yard from the 200-East to the 200-North Area requiring 52 man-hours.

Covering of contamination in the 200-West Area required the hauling and spreading of 400 cubic yards of material and 80 man-hours.

Completed the spraying of 700 Area buildings for insect control requiring 38 man-hours.

Handling of materials and equipment for the Stores Unit included 16 carloads and 136 truckloads and required 2,864 man-hours.

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HW-28906

Transportation Section

The daily trucking service between Richland and the Manufacturing Areas handled 306 cases of acid, 1471 cylinders of compressed gas, and 696 tons of operational supplies requiring 1,766 man-hours.

Administration Area maintenance services required 1,386 man-hours; ice handling 66 man-hours; mosquito control 335 man-hours; and miscellaneous work orders for the Community 231 man-hours.

The handling of office furniture, equipment and records involved 318 moving jobs requiring 1,272 man-hours.

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Copies #1 - 12-Plant Monthly
 13-HD Middel
 14-RB Britton
 15-FJ Mollerus
 16-AEC
 JI Thomas
 17-700 File
 18-300 File
 19-RA Carlberg
 20-O Mageehon
 21-ES Staples

August 6, 1953

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

JULY 1953

GENERAL

The Section total work force was one hundred and sixty-nine (169) as of July 31, a reduction of four from the previous month.

Process load power peak demand for July:

<u>Date</u>	<u>Demand KW</u>	<u>June Comparative KW Demand</u>
7-24-53 (9:30 AM-10:00 AM)	108125	108280

Seven employee information meetings were conducted by the writer to discuss matters of Section policy and performance with employees and advise them of organizational changes which bring the Section in line step-wise with Company plans.

C. T. Wagner, rotational trainee, was transferred to Lynn River Works.

T. E. Carney, telephone journeyman, optional retired June 30, 1953.

P. G. Sease, line foreman, was removed from the exempt roll and reclassified as a journeyman because of unsatisfactory supervisory performance.

All equipment bids opened June 23 for the official telephone exchange were cancelled by the Atomic Energy Commission and new bid assemblies, which request a 300 calendar day delivery, were mailed out with a scheduled opening date of August 27, 1953. Bids opened June 26 for the publication of four issues of a Richland telephone directory are awaiting Atomic Energy Commission decision and action.

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The problem presented by the lack of a Company policy relative to personnel on guided work has been more acute of late due to two continuing unresolved cases. The average age of our journeymen is comparatively high and a continuation of this frequency of medical restrictions will be critical.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

Unit forces are making final grounding connections to new substation fencing, Project CA-497, recently completed by contract.

A crane operated by Minor Construction personnel struck a 2300 volt line near the 241-UR tank farm on July 1 and blew the line fuses. The crane operator and the oiler were discharged.

On July 6, normal power to buildings 325, 326, and 329 was lost for twenty-five minutes when routine switching introduced a grounded condition and tripped the breaker at the primary substation. The cause was primarily due to incorrect switch numbering on the new 2300 volt circuit and the situation was corrected by our forces who shifted switch numbers.

A heron flew into the 66 KV station bus at the Hanford substation at 4:32 A. M. July 30, causing a differential relay operation and a four hour loss of power to 100-K Construction and White Bluffs.

The new Industrial Monkey (maintenance truck with boom platform) was delivered to the Transportation Section where minor safety corrections will be made before assignment to the Electrical Distribution Unit.

System Expansion and Planning

The 13.8 KV line constructed for service to Purex Area was tied into the Plant distribution system on July 11 and is ready for construction load.

The Doble power factor testing equipment was used on equipment at the 251 substation and Hanford substation. Equipment tested was within safe working limits, with a few minor exceptions.

A study is in progress to compare cost and service between concrete cone anchors and the treated log anchors now in use. Preliminary investigation points the concrete cone to be the more favorable and that appreciable savings may result from lower installation and depreciation costs.

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TELEPHONE UNIT

Maintenance and Operation

A summary of telephone service is as follows:

	<u>Subscriber Stations</u> <u>In Service</u>	<u>Lines Available</u> <u>For Service</u>	<u>Sides Available</u> <u>For Service</u>	<u>Exchange Lines</u> <u>In Service</u>
	<u>Res. and</u> <u>Misc.</u>	<u>Official</u>		
Richland	5851	968	73	3899
N. Richland	339	295	106	494
Process Areas	24	1573	403	1529
Total	6214	2836	582	5922

Richland Exchange four-party service:

	<u>July 23, 1953</u>	<u>June 23, 1953</u>
Number of Subscribers	911	889
Number of Vacant Sides	153	147

Ninety-three requests for residential telephone service were received, leaving a backlog of two hundred and thirty (230). During the month, solicitation resulted in six residential dial lines being changed to 4-party service.

System Expansion and Planning

Two lateral cables which will serve the Fifth and Sixth Housing Additions were tested and tied in and a third cable repaired.

A replacement cable providing service to the 2101 Building at 200 East was tested and tied in.

An acceptance test was made on the Blaw-Knox PBX switchboard and 10 two-way trunks were connected on July 8 for service to the Purex construction area. Forty stations are connected through this switchboard to date.

Made final inspection and accepted the telephone distribution system in the N-1 and N-2 areas of the Sixth Housing Addition.

RB Britton
ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

RB Britton:MAW:clh

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POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING July 31, 1953

744 Hours

	ENERGY - MW HRS.		MAXIMUM DEMAND - KW		LOAD FACTOR - %	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	28050	30025	43500	45200	89.6	89.3
A-4 Out (100-D)	15560	16540	23100	24700	93.6	90.0
A-5 Out (100-H)	9216	9972	14400	14450	88.9	92.8
A-6 Out (100-F)	5295	7880	11500	11900	63.9	89.0
A-8 Out (200 Area)	5544	5436	9360	9000	82.3	81.2
TOTAL OUT	63665	69853	101860**	105250**	86.8	89.2
MIDWAY IN	64192	70948	99600 *	100800 *	89.5	94.6
115 KV System						
B1-S4 Out (N. Rich.)	1550	1483	3053	2765	70.5	72.1
B1-S5	94	94	432	475	30.2	26.6
Richland	6946	7240	13760 *	13760 *	70.1	70.7
BB3-S4 Out (300 Area)	1240	1312	2720	2880	63.3	61.2
TOTAL OUT	9830	10129	19965**	19880**	68.4	68.5
Benton In	9980	10480	26800 *	29200 *	51.7	48.2
So. Richland In	100	0	16800 *	1600 *	.8	-
TOTAL IN	10080	10480	43600**	30800**	32.1	45.7
66 KV System						
B9-S11 Out (100-K)	558	582	1480	1560	52.4	51.8
B7-S10 Out (W. Bluffs)	333	330	1046	1125	44.2	40.7
Hanford Out	124	25	400**	400**	43.0	8.7
TOTAL OUT	1015	937	2926**	3085**	48.2	42.2
HANFORD IN	1005	923	2400 *	2200 *	58.2	58.3
Project Total						
230 KV Out	63665	69853	101860**	105250**	86.8	89.2
115 KV Out	9830	10129	19965**	19880**	68.4	68.5
66 KV Out	1015	937	2926**	3085**	48.2	42.2
TOTAL OUT	74510	80919	124751**	128215**	82.9	84.8
230 KV In	64192	70948	99600 *	100800 *	89.5	94.6
115 KV In	10080	10480	43600**	30800**	32.1	45.7
66 KV In	1005	923	2400**	2200**	58.2	58.3
TOTAL IN	75277	82351	145600	133800	71.8	82.7

* Denotes Coincidental Demand
** Denotes Non-Coincidental Demand

Average Power Factor - 230 KV System 90.5
Average Power Factor - 115 KV System 83.9
Average Power Factor - 66 KV System 87.3

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Megawatt Hours per Hour

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PLANT AUXILIARY OPERATIONS DEPARTMENT
STATISTICAL AND COMPUTING SECTION

MONTHLY REPORT - JULY, 1953

Personnel Statistics

Following is the month end summary of personnel:

Statistical and Computing Section

<u>Unit</u>	<u>As of 6-30-53</u>			<u>As of 7-31-53</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
Statistics	8	4	12	8	5	13	0	+1	+1
Computing	20	44	64	19	42	61	-1	-2	-3
Graphics	1	9	10	1	11	12	0	+2	+2
Procedures	8	5	13	10	4	14	+2	-1	+1
TOTAL	38	63	101	39	63	102	+1	0	+1

Statistics Unit

	<u>As of 6-30-53</u>			<u>As of 7-31-53</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
Administrative									
Statistics	3	0	3	3	0	3	0	0	0
Precision & Quality									
Control	1	2	3	1	2	3	0	0	0
Technical Statistics	3	1	4	3	1	4	0	0	0
TOTAL	8	4	12	8	5	13	0	+1	+1

One steno-typist was added to the Unit on July 13, 1953.

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Computing Unit

	<u>As of 6-30-53</u>			<u>As of 7-31-53</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	2	2	4	2	2	4	0	0	0
Analysis and Programming	11	5	16	11	6	17	0	+1	+1
Operation	7	35	42	6	33	39	-1	-2	-3
Rot. Training	0	2	2	0	1	1	0	-1	-1
TOTAL	20	44	64	19	42	61	-1	-2	-3

One IBM supervisor was transferred to the Procedures Unit on 7-1-53 and one rotational trainee was transferred to permanent assignment in the Unit effective 7-6-53. Two tabulating machine operators terminated effective 7-3-53.

Graphics Unit

	<u>As of 6-30-53</u>			<u>As of 7-31-53</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
Illustrators	0	7	7	0	9	9	0	+2	+2
Graphic Designer	0	1	1	0	1	1	0	0	0
TOTAL	1	9	10	1	11	12	0	+2	+2

One graphic illustrator was hired effective 7-27-53 and one graphic illustrator transferred from the Radiological Sciences Department effective 7-27-53.

Procedures Unit

	<u>As of 6-30-53</u>			<u>As of 7-31-53</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	3	3	0	2	2	0	-1	-1
Engineering Assistant	0	1	1	0	1	1	0	0	0
Procedure Analyst	7	0	7	9	0	9	+2	0	+2
TOTAL	8	5	13	10	4	14	+2	-1	+1

One junior engineer was transferred from the Computing Unit effective 7-1-53. One procedure analyst was hired effective 7-22-53. One general clerk terminated effective 7-24-53.

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FOR THE MANUFACTURING DEPARTMENT

The test pile precision was calculated for the second quarter of 1953 and was compared with previous precision calculations. These results were reported in a restricted letter. ("Variation of Test Pile Results - Second Quarter, 1953," to W. W. Windsheimer from D. O. Richards.

The routine monthly report on 300 Area production for the month of June was issued. (HW-28660, "Statistical Quality Report - 300 Area", to W. W. Windsheimer from the Statistics Unit.)

A request was received from the Process Sub-Section for an estimate of the cost of developing forms and procedures for recording and reporting on quality control, (letter: "Quality Control Forms, from H. G. Henry to H. Tellier, July 31, 1953). Discussions were held with representatives of the Metal Preparation Section regarding the recording of data on production and inspection.

A mathematical equation describing the concentration of dehydrating agent in successive drying stages as a function of the number of aluminum caps and cans processed was set up on the Card Programmed Calculator for the Metal Preparation Section to determine optimum operating conditions. A worthwhile saving is expected as a result of this computation from an 80% reduction in the quantity of dehydrating agent required. This analysis illustrates the manner in which mathematics can be employed to determine optimum operating conditions.

Assistance was given the Process Sub-Section in formulating and standardizing the method of computation and operation of control limits for Panellit deviation pressures. The recommended method of controlling film buildup in the reactors by means of control charts on Panellit deviations for selected tubes in each reactor is to be made standard operating procedure for each of the reactors. In view of the difficulty in administering such a program, a method was proposed which was very efficient and accurate yet involved a minimum of computation. (Letter from F. H. Tingey to D. D. Law, "Calculation of Limits for Panellit Pressure Deviations", dated July 27, 1953.)

An improved method of predicting cone screen plugging from process tube temperature and pressure data increased the number of cones found to be plugged from 20% to 100% of those inspected. Improved ability to predict plugged cones should result in more efficient utilization of down time, and possible earlier start-up.

To evaluate the radiation hazard involved mathematical expressions for the activity of a dummy slug as a function of irradiation time and burial time have been set up and are being evaluated on the Card Programmed Calculator.

Routine graphics work for the Manufacturing Department included preparation of material required for the 1953 Fiscal Year Control Chart Summary; plotting, inking and assembly of the July issue of Control Charts; and preliminary work on the new Control Chart plate masters for Fiscal Year 1954.

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A set of seven large lecture charts and illustrations were prepared by Graphics for the Manufacturing Department Manager to use in talks to Technical Graduates. Subject matter illustrated included production records, cost, productivity, personnel activities, and process flow.

A set of thirteen lecture charts are being prepared for the Manufacturing Department Manager to use in a talk to Section Personnel in the very near future. These charts will show actual cost and production performance for FY 1953 and will include bogeys for FY 1954.

88 1/2 hours were spent on forms design for the Manufacturing Department.

FOR THE ENGINEERING DEPARTMENT

At the request of the Engineering Department, the feasibility of making a quantitative estimate of the probability of a disaster at Hanford Atomic Products Operations was evaluated. Further work on the design of the necessary program is in progress.

A restricted document covering statistical studies of the reactivity testing of K Pile graphite was issued. (HW-28611, "Evaluation of k_{∞} Values of "K" Pile Graphite - First 218 Heats", to R. L. Dickeman from D. O. Richards.) This report completed the first phase of the program concerning graphite testing which is being conducted for the Engineering Department to the establishment of a suitable sampling plan.

The study of chemical impurities in metal produced by Mallinckrodt Chemical Works from January 1, 1952 to March of 1953, which is the most recent data received, is continuing. Groups interested in this study are the Atomic Energy Commission, the Manufacturing and Engineering Departments.

Analysis has been completed of the spectroscopic data submitted by the Chemistry Unit. The purpose of this study was to determine the effects of various carriers, the concentration of the carriers, and the current on the emission of various elements from uranium during spectroscopic analysis. It was found that the elements could be placed into three groups which responded in different degrees to an increase in concentration of carriers and current. The effects of increasing the current and concentration resulting generally in more emission. The effect of the increase in current was greater than that due to increase in concentration, but it also resulted in considerably more undesirable uranium emission. (Restricted letter from Virginia Clark to J. L. Daniels, "Analysis of Spectroscopic Data".)

Statistical analyses were made of the percentage of sonizon, poor braze plus bad weld, and non-seat rejects for four-inch slugs canned with two different bronze bath compositions, dip bath compositions, dip temperatures, dip times, and dip agitations. The purpose of these analyses was to find which of the five canning conditions or combination of conditions has a significant

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effect on the reject rate for the three reject criteria given above. This experiment was of the 2^5 factorial type, the design being established before the experiment was performed. The desirability and advantages of the statistically designed experiment were evidenced by the many results and inferences which resulted from this study. (Letter from Virginia Clark to H. A. Johnson, "Statistical Analysis of Sonizon, Poor Braze Plus Bad Weld, and Non-Seat Rejects for Test No. 346-A", dated July 27, 1953.)

A linear relationship was established for predicting percent tin content of Al-Si samples measured spectroscopically from observed solution potential. This represents a new method of analyzing the percent tin in the Al-Si bath which can be performed right on the canning line in a nominal time. With the relationship between this new method and the spectroscopic results known, uncertainty as to the tin content of the dip bath will be eliminated. More data will be received in the future which will make it possible to compute a relationship which will encompass a wider range of values. (Secret Rough Draft from Virginia Clark to F. A. Scott, "Line Predicting Per Cent Tin Content of Al-Si Sample from Observed Solution Potential".)

A statistical study is being made of the composition of inclusions in uranium. This problem is important because (1) it is known that the presence of inclusions can cause slug ruptures, and (2) basic improvements in the metal may be possible when the composition of the impurities in these inclusions are known.

The variation associated with the counts per second for a given angle setting in an X-ray counting mechanism was investigated. It was found that the decrease in variation obtained by taking more than 1,024 counts was not significant, which implies that 1,024 counts are sufficient to estimate the relationship between angle setting and counting rate. The question of how many angle settings should be taken to reproduce the true relationship to a reasonable degree of accuracy was more difficult to resolve. (Letter from J. L. Jaech to R. P. Hurst, "Analyses of the Variation of Counts Per Second for a Fixed Angle Setting in the X-Ray Diffraction Counting Mechanism", dated July 21, 1953.)

A mathematical equation was established relating slug corrosion rate to slug temperature.

Weibull and Normal curves were fitted to experience data relating slug exposure to slug failure rate for group 7 metal. Inferences were then made as to the behavior pattern of groups 8 and 9 metal on the basis of the known cumulative rupture rate at 600 M.W.D. and the fitted curves. Expected rupture rates at selected exposures above 600 M.W.D. were determined for groups 8 and 9 metal.

Data accumulated in the course of the slug rupture study are presently being analyzed. An empirical frequency distribution relating slug rupture rate and length of exposure has been formulated. Values of the parameters of the frequency distribution were calculated by machine.

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The precision estimates associated with calculated slug power determinations were determined as a function of flux and a power factor, each of which has associated with it asymmetrical absolute error values. Similar computations and determinations were made for cap temperature as a function of slug power and core temperature as a function of slug power. This problem offered unusual difficulties inasmuch as the error associated with a given determination was known only as an absolute error and was in most cases asymmetrical to the observed values. The procedure used was to determine the limits of absolute error on a calculated value and then postulate a skew type distribution to cover the range. The determination of the parameter of the distribution on the basis of the data available yielded 95 per cent confidence limits for the true calculated value.

An exponential curve of the form $y = ab^x$ was fitted to data on corrosion rate in mg/cm²/day versus integrated flux in neutrons/cm². (Letter from J. L. Jaech to S. Goldsmith, "Corrosion Rate of 2-S Aluminum Versus Integrated Flux", dated July 13, 1953.)

A study of the heat transfer characteristics of a reactor cross header has been undertaken by the Heat Transfer Sub-Unit, Pile Technology Sub-Section. Using the water flow and generated power of each tube, the average outlet water temperature of each cross header was computed. In addition, critical ratios were computed to point up unusual heat transfer conditions.

The problem of determining which operating variables are the most important in fixing certain end variables of the TEP process such as RAW loss, RCW loss, and RCU decontamination is being considered. Several multiple correlation studies involving from five to eight variables are being made. An attempt is being made to determine how to fix certain operating variables so that a designed experiment might be performed to help answer the many questions involved.

Graphs and charts were provided the Process Engineering Sub-Section which indicate the sample sizes necessary so that the observation of zero defects will lead to desirable statements as to the number of defects in lots of various sizes. These charts are proving to be of great value in helping this Sub-Section determine sample sizes for various in-pile tests of process equipment.

Routine computational work consisted of curve fitting to P-12 data, lattice conductance calculations for DR and H reactors, and Group Nine Metal Studies calculations.

As part of the study of the Classified Files a survey was conducted of 12 persons holding 11,960 documents or approximately 20% of the outstanding documents. The object of these interviews was to determine the reasons for such large holdings and to explore the possibilities of area files. In only one case would a field file reduce holdings and the quantity reduced is subject to question. (Letter: "Classified Files", to R. J. Schier from J. S. Marshall, July 31, 1953.)

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18 1/2 hours were spent on forms design for the Engineering Department.

Work continued on preliminary design and layout for visual aids to be used by the Engineering Department Manager in the October Board of Directors Meeting. Final approval of these sketches were received and work is in progress on the actual lecture plates.

Steady progress was made in constructing the 105-K Process Model. Fabrication of the foundation structure and moderator units was completed. Work continued in fabrication and assembly of the Exterior "B" Shield Face, the Ball BX Safety System, and process fittings including piping, valves, etc.

Preliminary work was started on the recently approved project of preparing a 1/4 inch per foot engineering scale model of the 202-A Purex Building. This is to be a section model and will include only cells "J" and "H" within columns 12 to 20 inclusive. To accompany this section, a display model of the over-all Purex Building is to be constructed at 1/16 inch per foot. The display model will be made in three removable layers, each layer to show the floor plan at a specified building elevation.

Routine graphics work for Applied Research consisted of the preparation of five charts for document HW-25615 titled "Determination of Uranium 237 and Fission Product Contamination in Redox Uranium"; completion of nine charts for document HW-26584 titled "Isotopic Content and Specific Activity of Pile Produced Plutonium"; and preparation of a chart for document HW-28628 titled "Per cent Ru Left in Supernate."

Routine graphics work for Pile Technology included completion of three graphs for a report titled "Curves for Electrode Type"; completion of seven charts for document HW-28374 titled "Interim Report No. 2 Production Test No. 105-506-E"; completion of eight charts for document HW-28011 titled "Slug Jacket Corrosion Rates"; completion of thirty-seven cut-a-way illustrations, diagrams, and photo retouched plates for a report titled "Automatic Digital Recording of Process Tube Water Temperatures in Hanford Reactors"; completion of ten illustrations, charts and photo-retouched plates for document HW-27533 titled "Effect of Pile Irradiation on Aluminum Corrosion"; completion of forty-five photo-retouched plates with descriptive information inserted for document HW-28207 titled "Flow Laboratory Investigation of F-Type Pitting of Slugs and Tubes"; and preparation of twelve charts for document HW-28527 titled "Pressure Drop Characteristics of 2 Phase Flow in Small Diameter Tubes."

Routine graphics work for Fuel Technology consisted of the preparation of a flow chart titled "Fuel Element Failure"; completion of six log-log charts titled "Properties of Gases vs. Pressure"; and general revisions to plates for document HW-26395 titled "Evaluation of Audica Films on Process Tube Exteriors."

Process Engineering requested Graphics to expedite work on document HW-28367 titled "Steam Conservation and Expansion of Process Water Pumping Capacity in 100 Area." This work consisted of drawing thirty charts, inking of thirteen plans and elevations of equipment, and retouching six photographs.

SECRETFOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

A letter was issued summarizing the overall operator results obtained from the Computing Unit key punching control study. The results showed that most of the experienced operators are doing a good job of key punching for routine work orders. (Letter, "Key Punch Studies - Overall Operator Results", from L. G. Waters to P. M. Thompson.)

A preliminary study of the possibility of using learning curves to predict the future performance of new key punch operators in the Computing Unit gave negative results. The difference between key punching jobs is apparently great enough to obscure the learning trends. (Letter, "Learning Curves for Key Punch Operators", from L. W. Smith to P. M. Thompson.)

The first reports of a new procedure for processing office machine data for the Clerical Services Sub-Unit, Plant Protection Section, were prepared. The inventory of office machines has been recorded in a punched card master file. Inventory listings, and billings for office machine rental were prepared this month. A procedure for monthly reporting of accumulated repair costs for each machine is being developed.

For the Purchasing and Stores Section a new quotation form was designed which includes a statement acknowledging the acceptance of General Electric's terms of purchase in the event of a successful bid. Preliminary results indicate the new method is operating satisfactorily.

New procedures were developed for the monthly summary of procurement action prepared for the Purchasing and Stores Section. These changes were necessary due to an accumulation of minor additions to the original report.

All recommended improvements to be made in the 200 West Laundry have been approved. The re-arrangement of work stations has been held up pending receipt of a new type laundry bag and the installation of a new loading dock and ramp.

Routine transportation and stores procurement actions reports were completed.

91 3/4 hours were spent on forms design for the Plant Auxiliary Operations Department.

FOR THE COMMUNITY OPERATIONS & REAL ESTATE DEPARTMENT

Electric billing procedures were revised to provide a preliminary list of consumption during vacancy and to include vacancies and late connects in the residential meter register. These changes will give the Richland Electrical Unit a complete accounting each month of all meters in service. The preliminary list of consumption during vacancy will help to eliminate errors in the billing operation. Electricity bills and associated reports were prepared.

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For the Richland Police Unit a system was developed for the "Mug File" to permit maintenance with a minimum of posting.

2 1/2 hours were spent on forms design for the Community Operations and Real Estate Department.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

Computational work has begun on a study of the distribution of radioactive phosphorous among the algae, plankton, sediment, water, and sides of the experimental aquarium tank. A set of mathematical expressions is desired as an integral part of the more general problem of determining and controlling the effects of radioactive materials on marine life.

A comparison between organic and inorganic media affecting the viability of chlorella cells was made.

The therapeutic effects of various agents on plutonium deposition in body tissues of rats were analyzed in order to determine which agents were the most effective in reducing the plutonium deposition. This study was the fourth in a series of five experiments conducted on rats. The agents having similar effects for a given body tissue were grouped together by statistical analyses. For a given treatment, the body tissues having similar plutonium deposition were also grouped together. Estimates and confidence limits for the treatment-body tissue mean depositions of plutonium were calculated in terms of d/m, percentage of amount injected, and d/m/gram. (Letter from D. W. Gaylor to J. Katz, "Therapeutic Effects of Various Agents on Plutonium Deposition in Body Tissues of Rats - X-4", dated July 20, 1953.) The various therapeutic agents used on Experiments 3 and 4 were compared in order to determine which of the agents were the most effective in reducing the plutonium deposition in the body tissues of rats. The various agents were ranked by statistical methods as to effectiveness. Estimates and confidence limits for the treatment-body tissue mean depositions were calculated for per cent of total plutonium injected. (Letter from D. W. Gaylor to J. Katz, "Therapeutic Effects of Various Agents on Plutonium Deposition in Body Tissues of Rats - Comparison of X-3 with X-4", dated July 23, 1953.) The fifth in a series of experiments dealing with the screening of various therapeutic agents for plutonium deposition is now in the process of being analyzed. The results of Experiments 3 and 4 in which the therapeutic agents were applied immediately after plutonium injection in rats are being compared with the results of Experiment 5, in which the therapeutic agents were applied thirty days after the plutonium injection.

Estimates and confidence limits for body tissue deposition for several groups of high level plutonium chronically fed rats are being computed. This is the second experiment dealing with rats fed in this fashion and the results of this experiment, along with the first experiment which dealt with lower dosages, should aid in the establishment of the maximum permissible concentration of plutonium in drinking water.

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Plutonium deposition in the various body tissues, blood stream, and waste products of dogs injected with plutonium and treated with various levels of the same therapeutic agent are being analyzed for several series of experiments.

Analysis was made of PBI versus Q/q values for sheep to determine the advisability of discontinuing PBI measurement. The PBI measurements appear to follow the same general trend as the Q/q which are more readily obtainable.

Routine computational work for the Radiological Sciences Department consisted of Aquatic Biology calculations, sheep thyroid and radioanalysis calculations, and wind study calculations for May and June.

A special request to expedite preparation of a number of plates for offsite publication was received from the Director of the Radiological Sciences Department. This work included an illustration of "Treatment Application to Tumor Area; a chart on "Radium Dose Distribution"; and seven graphs on "Calculated Distribution of Radiation Around Radium Needles."

Routine graphics work for the Radiological Sciences Department consisted of preparation of sketches on Radiation, Contamination Material and Measurement Instruments; preparation of a large 30" x 40" Radiation Control Chart; revising plates for a pamphlet on Radiation Protection; preparation of three plates for slides on "Energy Sensitivity of du Pont 502 Film"; completion of a perspective cut-a-way illustration of a Plant Climatizer Unit; and completion of a chart in color on "Thyroid Function of Ewes."

17 hours were spent on forms design for the Radiological Sciences Department.

FOR THE MEDICAL DEPARTMENT

At the request of the Public Health and Welfare Section, records concerning Richland and national death rates were examined statistically. The analysis took into account the unusual age distribution of the population of Richland as compared to the national, and considered only the white race. (Letter, "White Race Death Rates - Richland Versus National, from L. G. Waters to R. R. Sachs, M. D.)

A statistical study of visits to plant first aid stations during the past six years is being made.

Routine Public Health activities reports were prepared.

16 hours were spent on forms design for the Medical Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

Services were rendered to the Salary Administration Section in the analysis of 1953 National Salary Survey data. For executive, administrative, and operating positions, curves expressing the relationship between monthly

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salaries and job grades were fitted to the data. (Letter, "Curve Fitting for E.A.O. Positions", from L. G. Waters to R. C. Grant.) For professional positions, trend lines were fitted to express the relationship between monthly salaries and years since first degree, combining the bachelors and masters degrees but keeping the doctors degree separate. (Letter, "Curve Fitting for Professional Positions", from L. G. Waters to G. C. Swanson.) In addition, many curves were fitted to allow comparisons to be made between survey results and Hanford Atomic Products Operation salary data for professional positions. (Letter, "Curve Fitting for Professional Positions - Survey Versus Hanford Atomic Products Operation", from L. G. Waters to R. C. Grant.) Other analyses are continuing.

Routine graphics work for the Salary Administration Section of Employee and Public Relations consisted of the preparation of two charts on Hanford Executive and Administrative Salaries vs. 1951 and 1952 Surveys; completion of a Wage Rate Study Chart and a chart on "Hiring Rate Ranges for Technical Trained Graduates"; completion of eleven charts on "Average Line of Salary Relationships"; and completion of two charts on "General Electric Wage Rate Comparisons with Northwest Areas."

The analysis of the results of the recently conducted attitude survey on the SAGE publication was completed. The purpose of the survey was to determine whether or not this publication should be continued. (Letter, "Attitude Toward the SAGE Publication", from L. G. Waters to D. G. Dayton.)

A final report has been issued presenting the results of a statistical analysis of all employee separations during the year 1952. Significant differences were found between the separations rates of employees classified by sex, marital status, department age, and length of service, to cite the most important factors studied. All separations which could conceivably be prevented once the employee is hired were analyzed separately. (Report, "Employee Separations, Hanford Atomic Products Operations", from Joan Cannon to G. D. Barr.)

A multiple regression analysis was performed on data consisting of the scores of thirty-seven employees in six tests given by the Employee and Public Relations Department at the time of hiring, and several measures of the instrument school performance of these same employees. An equation relating scores on certain tests with instrument school performance was established with the objective of predicting future job performance. (Letter, "Multiple Regression Analysis of Test Scores", from Joan Cannon to Z. D. Wood.)

Gummed labels were prepared for the Employee Benefits Sub-Unit for all non-exempt employees other than technical graduates.

14 hours were spent on forms design for the Employee and Public Relations Department.

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The non-exempt salary distribution procedure was revised to facilitate accuracy control. Earnings for the salary distribution are taken from the payroll earnings cards which are in payroll number sequence. For the salary distribution, the cards are sorted into organizational unit sequence. Prior to this revision, the only control total carried forward was the grand total for the entire payroll. If an error occurred it was known only that it was somewhere within a deck of 18,000 cards. With this revision, sub-totals for accuracy control by organizational unit are prepared while the cards are still in pay number sequence. If an error occurs now, it can be isolated quickly to approximately 100 cards, thus reducing enormously the complexity of locating errors. This technique, which involves use of the card programmed calculator, may be further utilized where labor cards are rearranged again from Departmental sequence to work order sequence.

The procedure was revised for preparing supplemental work order reports so that reports will be prepared only at the request of the Cost Units. This change eliminates the need for maintaining the closed work order master file.

The change over of the Community Operations and Real Estate Department to the use of the time card for non-exempt salary distribution was accomplished.

The Salary Distribution procedures were revised to include a 16% accrual for week ending July 26th and a 4% accrual thereafter.

A meeting was held with representatives of the Engineering Cost Unit to discuss possible IBM application for Salary Distribution for Design Section Costs.

Study of the problem of preparation of the exempt salary payroll has been started. Tentative outlines of card forms and methods of calculation have been produced. To immediately alleviate the manual work on the exempt salary roll within the Payroll Unit it has been suggested that all calculations and reports other than the check and payroll register be done by IBM machines. (Letter: 'Exempt Payroll Preparation,' from F. J. Thomason to E. F. Charette.)

Changes were made in the operating procedures for exempt salary distribution to allow the Payroll Unit to balance the totals of various types of entries.

A procedure was developed to calculate new base rates plus the 12% override for the exempt payroll. At the same time this calculation was performed the June portion of the retroactive payment effective June 10th was calculated.

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The "Quarterly Report of Wages Taxable under the Federal Insurance Contributions Act" was prepared for both the exempt and non-exempt payrolls. Assistance was given in balancing and reconciling these reports with the year-to-date controls and the first quarter reports.

A procedure was written to furnish an alphabetical listing of exempt employees within organizational code.

Discussions were held with Payroll Unit representatives to establish the procedures to be followed in gathering data for retroactive payment of non-exempt increased earnings effective June 10th. Due to the fact that the effective date splits a payroll period and the amount of increased earnings must be based on hours worked at specific rates, the retroactive payment cannot be made until August 21st.

An Electronic Statistical Machine application on the weekly non-exempt payroll is being developed. This operation will perform an edit of the assembled deck of IBM cards to assure proper assembly and control that here-to-fore has not been possible to make with prior machines.

A revision was made in the weekly non-exempt payroll procedure which eliminates preparation of the "pre-register". This change is estimated to reduce operating time by 5 hours each week.

A trial run was made on the cost distribution of printing orders and a similar run will be made of duplicating orders.

Preliminary procedures were written on the distribution of charges from store orders and accounts payable vouchers.

A meeting was held with representatives of the Plant Accounts Sub-Unit regarding possible use of IBM equipment for plant accounting records. It was agreed that sample reports will be prepared from the IBM records on office machines which have been set up for the Office Unit of the Plant Protection Section.

A report was made on the study of the possibilities of consolidation of certain records and files of non-exempt employees maintained by the Payroll Unit and various Units of the Employee and Public Relations Department. It would appear that a central personnel file is feasible at substantially lower cost than that now incurred. However, before any final recommendation can be made a broad detailed study must be made. (Letter: "Payroll Records -- Report of Scoping Investigation", to J. P. Holmes from J. S. Marshall, July 20, 1953.)

A system of punched card control over payroll authorization papers was proposed. This control was suggested to permit filing of payroll authorizations outside of the Payroll Unit. (Letter: "Personnel Records", to J. P. Holmes, from J. S. Marshall, July 22, 1953.)

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Routine work was completed on weekly payroll calculations, cancelled check reconciliation, payroll statistics, motorized equipment billing, weekly and monthly salary distribution, and work order distribution.

28 3/4 hours were spent on forms design for the Financial Department.

Material was submitted to the Graphics Unit by the Manager, Financial Department to be developed for the Board of Directors Meeting in October. Sketches have been prepared and were submitted for approval.

Routine graphics work for the Financial Department consisted of posting current data to the Employee Payroll Statistics charts; and making general revisions and plotting current data to the R & D Operating Costs and Budget Charts.

FOR THE ADMINISTRATIVE STAFF

A series of studies are in progress on errors in the measurement of percentage uranium in UO_3 powder. The first study to be completed was conducted because of a suspicion that the mechanical sampling ordinarily used might have a measurement bias. However, the results (HW-28626, "Sampling of UO_3 Powder in Determining Uranium Percentage", from N. D. Peterson to C. B. McKee, dated July 6, 1953) revealed no evidence that there is any systematic bias between the usual sampling method and the thief sampling selected as a standard for comparison. Next, analyses performed in the above study were combined with data collected earlier in order to estimate the analytical precision of gravimetric determination which has replaced X-ray determination in the measurement of percentage uranium (HW-28907, "Analytical Precision in Gravimetric UO_3 Determination", from N. D. Peterson to M. J. Rasmussen, dated July 31, 1953). Finally, completion of a study of random sampling errors and lot variability, together with a recapitulation of the studies, is expected in the near future upon receipt of further data.

Nearing completion is a study of assay differences in plutonium nitrate shipments to Dow Chemical Works and to Los Alamos Scientific Laboratory. The purpose is to investigate the presence of any non-randomness in these differences, to obtain a quantitative estimate of the random variation present together with appropriate control limits for future use, and to describe the nature of the non-random variation.

Also in progress is a revision of the previous study, "Uranium-Specific Gravity Relationships of RCU and Their Bearing on Computational Estimation" (restricted memorandum from N. D. Peterson to C. B. McKee, dated June 29, 1953). This is needed because of a change in the composition of the solution. Both studies are concerned with the close relationship between specific gravity and uranium concentration measurements on the solution in tanks 15-1 and 15-6 in Building 221-U, and the possible estimation of one from the other by computational methods. This study is being conducted jointly for Accountability and for TBP Separations Section, Operations Unit, Metal Recovery Facility.

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Thirty supervisors were interviewed to determine what kinds of paper work supervisors consider unnecessary. The interviews revealed that the paper work supervisors object to is created by the internal procedures within their particular section, unit, or sub-unit. Inter departmental paper work was not found troublesome. Rather, it is in the intra departmental systems of recording, summarizing, and transmitting information for report and control purposes that considerable overlapping and duplication of effort is believed to exist (letter, "Preliminary Interviewing of Supervisors on their Paperwork Problems," to H. Tellier from L. W. Smith, July 15, 1953.)

An analysis is being made of the number of copies and the flow of documents required for procurement of general supplies items. The same type of analysis will be made next of the functions of receiving and invoice payment. At this moment the analysis clearly indicates that a re-evaluation of these operations should reduce great quantities of paper work.

The study being made of the problems of paperwork indicates a number of cases of duplicate records and files being maintained by various functional groups. Consideration is being given to the possibilities of a central file in the 700 Area.

9 3/4 hours were spent on forms design for the Administrative Staff.

FOR THE ATOMIC ENERGY COMMISSION

A number of special calculations are being made in connection with Project Bluenose.

Graphics work for the Engineering and Construction office of the Atomic Energy Commission consisted of the preparation of four schematic illustrations and one chart to be used in a report titled "Enrichment of Reactor for Flattening of Flux." Routine work for Engineering and Construction included plotting current data to the Blaw-Knox and Kellex Manpower Forecast charts; and completion of two control charts titled "Sub-contractors Ratio of Non-manual Labor to Total Force".

Graphics work for A.E.C. Property Management consisted of the completion of five flow charts on property control procedures.

Graphics work for A.E.C. Financial included preparation of one chart on actual and estimated construction costs; completion of two progress control graphs on "Status of Internal Audit Program"; and plotting of current data to two construction cost control charts.

Monthly, quarterly, and annual motorized vehicle reports were prepared.

SUMMARY

During the month of July 136 statistical, procedural, computational and graphical problems were completed, and as of July 31, a backlog of 239 problems were on hand.

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Department Served	Percent of Services Rendered					Statistical & Computing Section
	Units					
	Statistics	Procedures	Computing	Graphics		
Manufacturing	8	6	4	5	5	
Engineering	24	6	23	65	25	
Plant Auxiliary Operations	4	32	1	4	5	
Community Operations & Real Estate	0	3	4	0	3	
Radiological Sciences	14	1	4	9	5	
Medical	3	1	0	0	0	
Employee and Public Relations	14	14	0	7	4	
Financial	1	22	58	3	45	
Administrative Staff	13	15	0	0	3	
Atomic Energy Commission	19	0	6	7	7	
TOTAL	100	100	100	100	100	

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EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY -- JULY, 1953

The number of applicants interviewed in July was 1,397, as compared with 1,722 for June. In addition, 129 new applicants applied by mail. Open, nonexempt, nontechnical requisitions decreased from 273 at the beginning of the month to 262 at month end. One hundred and fourteen employees were added to the roll and 113 removed during the month. Separation rate decreased from 1.57% in June to 1.01% in July. During July, 49 new requests for transfer to other type work were received by Employment and 51 transfers were effected. Attendance recognition awards were distributed to 191 employees in July, including 51 employees who qualified for three-year awards.

Two employees died during the month and three employees retired. One hundred and ninety-one visits were made to employees confined to Kadlec Hospital and 46 checks were delivered to employees confined at the Hospital or at home. At month end, participation in the Pension Plan was 95.5% , in the Insurance Plan 98.9%, and the Employee Savings and Stock Bonus Plan 44.5%. At month end there were 825 registered under Selective Service and 773 military reservists were on the roll. Since August 1, 1950, 290 employees have terminated to enter military service, of which 69 have returned, 7 have not claimed reemployment rights, leaving 214 still in military-leave status.

Orientation of new employees was presented daily throughout the month. A total of 95 employees attended this program. Of this number, 95.7% have signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 82.1% in the Good Neighbor Fund.

Ninety-one adopted suggestions were approved for awards in July, resulting in cash awards totaling \$2,080, with total net savings of \$16,146.45.

A carefully developed questionnaire to gather data needed for evolving possible future policy changes in the retirement program of the Company, or for developing Employee Relations programs dealing with retirement will be administered at HAPO through immediate supervisors at the time application for pension is made by individual employees. The purpose of the program was outlined in an issue of the Management News Bulletin and an explanatory letter will accompany each questionnaire as it is sent to a supervisor for completion and forwarding to Employee Benefits Research Section, Schenectady.

As of June 30, 61.4% of Hanford employees were participating in the Good Neighbor Fund which represents an increase of 11% since establishment of the Fund in October, 1952.

Colonel Perry from the National Selective Service Office together with Mr. Henderson from the AEC Washington Office and Captain Chastick, Head of Washington State Selective Service Organization, visited Hanford recently, and in addition to discussion meetings with AEC and GE representatives, Colonel Perry and Mr. Henderson

Employee and Public Relations Summary

were taken on a tour of the Plant. The primary purpose being to acquaint these people with some of the deferment problems as they relate to technical personnel.

During the month 262 Stenographers and Secretaries attended the 4-hour training program being offered by Training and Program Development.

Commencing July 20, a prepared statement is being used in the Orientation program for new employees, outlining in general terms, the rules of conduct employees are expected to observe, as well as disciplinary action which may be taken when an employee violates such rules.

On July 13, G. R. Fugal, Manager, Employee Practices, Employee and Plant Community Relations Services Division, presented at Hanford a condensed version of the GE Personnel Selection Program. A group of 46 were present at the meeting, representing most of the departments, and numerous favorable comments were received concerning the presentation.

Copies of GE's "Scrapbook History" were mailed to all employees' homes together with an Employee News Letter signed by the General Manager. Approximately 250 copies were given to Public Relations for distribution to Community Leaders; and another 100 copies were distributed throughout the various booklet racks in the plant.

Special Programs was requested to prepare a brochure for presentation to members of the Board of Directors during their Fall visit. The size (approximately 5"x8"), the contents, and the general layout were developed during the month and approved by the management committee in charge of arrangements.

During July, 41 projection engagements were filled by the Special Program's projectionist. In addition, both the projection equipment and the film "A is For Atom" were loaned to various groups frequently. As a result, "A is For Atom" was shown 38 times to approximately 1300 employees.

"Buy-Sell-Swap" column appeared in the GE NEWS for the first time in July under the name of "Trading Post." Although employee participation in the column has not been large, reactions to its appearance were most favorable. Many of those submitting listings reported successful transactions.

Safety was approached in various ways during the month, from a half-page of pictures showing good housekeeping, with an accompanying editorial, to a front page picture and caption showing an annual "S" Day being observed in the 300 Area. Special news story also covered the 700 Area winning the Area Injury Reduction Award for the second time.

AEC commendation of GE's efforts in the atomic energy program was published in the GE NEWS. Special permission was obtained from the Spokesman Review's managing editor to reprint an editorial run by that paper commenting on AEC's recognition of the Company's work at Hanford.

**Employee and Public Relations
Summary**

New transportation facilities being constructed to provide better service for Hanford people provided lead material for GE NEWS. Picture, artist's sketch and story were published in GE NEWS telling of initial work being started. This story was supplemented in later GE NEWS issue with story of new buses being procured to transport people to and from the Areas.

Communications at Hanford received feature treatment in a GE NEWS double page spread designed to show employees how information is passed on down through a department until it reaches the employee. Major emphasis was on importance of employee information meetings.

"Talk It Over" sessions between supervisor and nonexempt employees on an individual basis were scheduled to be held concurrently with nonexempt employee ratings during September. Preparation of "aids" to assist supervisors in holding these sessions was begun with distribution planned for early August. Conducting of "Talk It Over" interviews between members of management is being left to individual departments.

Employee Communications accepted responsibility for obtaining training films for plant showings, in addition to the established activity of providing limited projectionist service for film showings.

Management Orientation was presented on Monday, July 6, with 11 new exempt personnel attending. Supervisors' 40-Hour program scheduled for the week of July 27 to 31 was cancelled due to insufficient enrollment. Policy Panel Seminar scheduled for the week of July 13-17 (half days) was also cancelled due to insufficient enrollment. Principles and Methods of Supervision -- Group #52 of 21 supervisors completed the study of the methods during a two-week period July 13-24 in Richland. Conference Leading was conducted on Tuesday, July 7, with 16 supervisors present. At the request of the Separations Section this program was conducted in the 200-W Area on Thursday, July 9, with 16 supervisors participating. Again at the request of Community Operations and Real Estate this meeting was presented to 13 supervisors in Dorm W-20, Richland, on Thursday, July 21. No Management Development programs have been scheduled during the months of June, July or August because of peak vacation schedules and resultant low enrollment for programs. SAGE - Survey questionnaire summaries show that the majority of supervisors desire this publication to be continued. Stenographic-Secretarial program was presented 16 times (from July 8 to July 30) with a total of 262 stenographers and secretaries in attendance. Favorable acceptance of this program has resulted in requests to show the films "Telephone Courtesy" and "By Jupiter" to a group of 33 Cost Accounting personnel on Thursday, July 30, and for two other showings for other groups during the month of August. HOBSO II - On July 1, 2 and 3, Training personnel participated in a preliminary institute to study HOBSO II. Conference Rooms - The Hanford High School has been vacated effective July 31. Arrangements have been made to use the conference room located at the Pistol Range (near Hanford).

Employee and Public Relations
Summary

The News Bureau produced 65 releases during the month. Of these, 25 were sent to the local list and radio stations. Five were sent to media throughout the Northwest, one to a hometown paper, one to a college paper, two to trade journals and one to a company publication.

A feature story was written on the boat used by Radiological Sciences to take samples from the river. The story was syndicated to five boat magazines, and by month's end, two had written to ask for pictures to illustrate it.

Another feature concerning the "Climatizer," was rewritten and distributed to a selected group of weekly newspapers.

On July 21, a chemist in the Technical Section received contamination in his hair and face while working in a lab at 300 Area. A story was gotten out to AP and UP to forestall sensational but erroneous stories. The following week, a TIME magazine reporter called asking for answers to a long list of questions and requested pictures of the employee.

Work has begun on preparation of the Hanford article for the January issue of the GE REVIEW. This issue will sum-up engineering and technical accomplishments for the calendar year.

The local Tri-City HERALD, reporter interviewed the General Manager and the Manager of Manufacturing as sources of the first three of a series of about six news articles. These will explain, in layman's terms, as much as security permits about the industrial operation at Hanford.

A non-competitive float on the theme of the 75th Anniversary is being constructed and will be entered in the Atomic Frontier Days parade.

"30 for the Month" was distributed to Lists 1 and 2 during the month.

The July issue of the Community NEWSLETTER was distributed to Community Leaders in Pasco, Kennewick, and Richland.

Nine papers were received, reviewed and cleared for presentation or publication, during the month.

A total of 150 photography assignments were covered during the month of July. A total of 16,937 prints were produced, of which 13,338 were "A" and "B" badge prints.

"105-C Graphite," the feature-length 16mm training documentary motion picture produced by Public Relations for Design Section has been completed and a special preview showing was held for the customer on July 23. Comments received were very complimentary, especially to the effect that the film appeared to be excellent for its intended use in training.

Employee and Public Relations Summary

The Atomic Energy Commission's Savannah River Operations Office inquired, through Hanford Operations Office, as to the possibility of purchasing a print of the motion picture "Radiation Hazards Control" produced by Public Relations for Manufacturing Department last year. They wish to review the print first, and a tentative showing has been arranged for local Atomic Energy Commission officials to review it along with the other films which have been produced by this Section.

Eighteen films were obtained from the General Electric Company and other approved sources for showings in training and information meetings within the plant. During the first six months of 1953 over 50 of these films were obtained for plant use by Public Relations.

During July, Salary Administration completed the analysis of National and West Coast Survey data and prepared the survey reports for publication. The analysis of 1953 survey against 1952 survey shows overall average increases slightly less than the total general adjustment applied at Hanford. At month end the Reimbursement Authorizations were in preparation for presenting these facts to the Commission and getting their concurrence with our proposed salary actions for the coming year.

Position evaluations were brought into a current status during the month, and field reviews of positions were continued.

A strike of 3500 AFL production workers in the X-10 (research lab) and Y-12 (radioactive isotopes) plants at Oak Ridge occurred on July 27. The HAMTC threatened to file an unfair labor practice charge with the NLRB unless R. A. Carlson is reactivated in his former position as a Railroad Conductor. Formal acceptance of the current wage offer was received from the HAMTC, BSEIU, and HGU on July 9. We received assurances from the HAMTC that GE Plumbers would perform tie-ins in connection with the work recently awarded Cisco in the North Richland well field area. Copies of the HAMTC-GE and the HGU-GE Agreements in pamphlet form were distributed to supervisory personnel. A draft of a revised Community Firemen Agreement has been prepared, incorporating into it the applicable provisions recently negotiated with the other bargaining units. An "Order of Dismissal with Prejudice and without Costs" in the R. E. Mercer case was issued by the Benton County Superior Court on July 10. President Eisenhower has appointed four members of the 6-man Labor-Management Relations Panel. Guy Farmer has been named to take over the unexpired term of retired NLRB Chairman Herzog. The Senate has confirmed Whitley P. McCoy as Director of the Federal Mediation and Conciliation Service to succeed David L. Cole. The Republican administration moved a step nearer to a Republican-controlled NLRB with the appointment of a second member of the GOP, Philip R. Rodgers.

Employee and Public Relations
Summary

The union has proposed arbitration of the issue of isolation pay for Bus Drivers who begin their workdays in North Richland. The dispute between the Plumbers and Blaw-Knox has been resolved and men are again being dispatched to the job. A week-long "wildcat" strike of Sheet Metal Workers in the 2101 Building ended July 8. The dispute between the Machinists and the Millwrights flared up again on July 22 and the Millwrights walked off the job. Settlement was effected and work was resumed on July 29. Arbitration of the Carpenter travel pay dispute resulted in a decision for the Company (Kaiser). Cisco is attempting to make peace with the Plumbers. The Hanford Addendum to the Asbestos Workers' Agreement expired and they are refusing to dispatch men to the project or to renew the Agreement.

Included in current negotiations is a demand for "onerous" pay based on a practice in effect at Los Alamos. Agreement has been reached on a new Schedule "A" for the Operating Engineers which conforms to the contract negotiated by the AGC in Spokane.

Three reimbursement authorizations were received from the Atomic Energy Commission covering the new wage increase and the establishment of certain new classifications. Copies of the internal Northwest Area Wage Rate Survey were distributed to management in Richland, New York, and Schenectady.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

JULY, 1953

ORGANIZATION AND PERSONNEL

General

There were no organizational changes during July.

Employee Relations

Effective July 6, 1953, Glenna McClenaghan, Stenographer, was assigned to the Suggestion System to replace Genevieve Berst who terminated July 31, 1953.

Effective July 13, 1953, Maurine Belcher, was promoted to Secretary B and transferred from Public Relations to Personnel Practices.

Effective July 24, 1953, Dorothy Eno, Secretary B, terminated.

Public Relations

Effective July 13, 1953, Maurine Belcher, Secretary C, transferred to the Employee Relations Section and was replaced on July 20 by Joann Anselone.

Technical Personnel

Effective July 20, 1953, Joann Anselone transferred to the Public Relations Section.

Effective July 5, 1953, Fred Clagett transferred to Technical Personnel from the Technical Section of Engineering.

Trainees - Beginning of Month 77 - End of Month 79

Net Change:	Placements in departments	2
	Resignations (military)	1
	(other)	1
	New Hires	6

Salary Administration

There were no organizational changes during July.

Union Relations

Effective July 15, 1953, Darald H. Staley, Wage Analyst, resigned from Wage Rates.
Effective July 17, 1953, Mildred J. Bennett, Secretary C, resigned from Wage Rates.

Number of Employees on Roll	<u>July, 1953</u>
Beginning of Month	204
End of Month	<u>204</u>
Net Change	0

Employee and Public Relations

EMPLOYEE RELATIONS

Personnel Practices

Employment

	<u>June, 1953</u>	<u>July, 1953</u>
Applicants interviewed	1,722	1,397

509 of the applicants interviewed during July were individuals who applied for employment with the Company for the first time. In addition, 129 applications were received through the mail.

Open Requisitions	<u>June, 1953</u>	<u>July, 1953</u>
Exempt	6	0
Nonexempt	273	262

Of the 273 open, nonexempt, nontechnical requisitions at the beginning of the month, 126 were covered by interim commitments. Of the 262 open, nonexempt, nontechnical requisitions at month end, 152 were covered by interim commitments. During July, 101 new requisitions were received requesting the employment of 112 nonexempt, nontechnical employees.

	<u>June, 1953</u>	<u>July, 1953</u>
Employees added to the rolls	179	114
Employees removed from the rolls	<u>119</u>	<u>113</u>
NET GAIN OR LOSS	+60	+ 1

Separation:

	<u>Fiscal Month</u> <u>June, 1953</u>		<u>Fiscal Month</u> <u>July, 1953</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Including employees who were laid off for lack of work	1.00%	4.00%	.66%	2.42%
Excluding employees who were laid off for lack of work	.97%	4.00%	.65%	2.42%

Employees and Public Relations

EMPLOYEE RELATIONS

Over-all Separation:

	<u>Fiscal Month June, 1953</u>	<u>Fiscal Month July, 1953</u>
Including employees who were laid off for lack of work	1.57%	1.01%
Excluding employees who were laid off for lack of work	1.55%	1.00%

During July, 16 employees left voluntarily to accept other employment, two left to enter military service, and four left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-53	345
Number of requests for transfer received during July	49
Number interviewed in July, including promotional transfers	59
Transfers effected in July, including promotional transfers	51
Transfers effected since 1-1-53, including promotional transfers	307
Transfers effected in July for employees being laid off	0
Number of stenographers transferred out of steno pool in July	10
Transfer requests active at month end	314

ADDITION TO THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
New Hires	7	78	3	88
Re-engaged	---	---	---	---
Reactivations	---	20	---	20
Transfers	<u>6</u>	<u>---</u>	<u>---</u>	<u>6</u>
TOTAL ADDITIONS	13	98	3	114

TERMINATIONS FROM THE ROLLS

	<u>Exempt</u>	<u>Nonexempt</u>	<u>Community Firemen</u>	<u>Total</u>
Actual Terminations	11	64	---	75
Removals from rolls (deactivations)	4	30	---	34
Transfers	<u>3</u>	<u>1</u>	<u>---</u>	<u>4</u>
TOTAL TERMINATIONS	18	95	---	113

Employee and Public Relations

EMPLOYEE RELATIONS

GENERAL

	<u>6-1953</u>	<u>7-1953</u>
Photographs taken	410	308
Fingerprint impressions	244	193

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	<u>6-1953</u>	<u>7-1953</u>
General Electric cases	110	133
Facility cases	26	31
TOTAL	136	164

INVESTIGATION STATISTICS

	<u>6-1953</u>	<u>7-1953</u>
Cases received during the month	181	158
Cases closed	165	148
Cases found satisfactory for employment	120	139
Cases found unsatisfactory for employment	4	3
Cases closed before investigation completed	33	18
Special investigations conducted	16	2

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6034
One-year awards made in July for those qualifying in June	64
Total two-year awards to date since January 1, 1950	1639
Two-year awards made in July for those qualifying in June	76
Total three-year awards to date	482
Three-year awards made in July for those qualifying in June	51

During July, 31 people whose continuity of service was broken while in an inactive status were so informed by letter.

During the month, 262 Stenographers and Secretaries attended the 4-hour training program being offered by Training and Program Development.

On July 13, G. R. Fugal, Manager, Employee Practices, Employee and Plant Community Relations Services Division, presented at Hanford a condensed version of the GE Personnel Selection Program. A group of 46 were present at the meeting, representing most of the departments, and numerous favorable comments were received concerning the presentation.

Employee and Public Relations

EMPLOYEE RELATIONS

Supervisor Selection Program - During the month ten candidates were tested, nine of which were for the Electrical Distribution and Telephone Section - a group which had not previously used the procedure.

Instrument Trainees - The statistical work on this study was completed and two of the tests included in the validation study show promise. They are the Wonderlic Personnel test and the Numerical Ability test.

Employee Benefits

The following visits were made with employees during the month:

Employee contacts made at Kadlec Hospital	191
Salary checks delivered to employees at Kadlec Hospital	37
Salary checks delivered to employees at home	9

At month end participation in Benefit Plans was as follows:

	<u>June</u>	<u>July</u>
Pension Plan	95.4%	95.5%
Insurance Plan	98.8%	98.9%
Employee Savings and Stock Bonus Plan	44.1%	44.5%

Two employees died during July, namely:

Arthur W. Pape, W-5878-976, Plant Auxiliary Operations
Edwin Neff Wooley, M-1927-782, Accountability

Fifteen letters were written to deceased employees' families during July concerning payment of monies due them from the Company, and also to answer their questions.

Since September 1, 1946, 124 life insurance claims have been paid totaling \$763,013.

Three employees retired during July, namely:

Albert L. Gipson	W-6982-942	Normal Retirement
William M. Wheat	W-8179-627	Optional Retirement
Orvel B. Church	W-8409-333	Optional Retirement

During July, 35 letters were written to retired employees providing them with information of general interest. To date 260 employees have retired at Hanford, of which 134 are continuing their residence in the vicinity.

Employee and Public Relations

EMPLOYEE RELATIONS

Orientation of new employees was presented daily throughout the month. A total of 95 employees attended this program. Of this number, 95.7% signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 82.1% in the Good Neighbor Fund.

Commencing July 20, a prepared statement is being used in the Orientation program for new employees, outlining in general terms, the rules of conduct employees are expected to observe, as well as disciplinary action which may be taken when an employee violates such rules.

A carefully developed questionnaire to gather data needed for evolving possible future policy changes in the retirement program of the Company, or for developing Employee Relations programs dealing with retirement will be administered at HAPO through immediate supervisors at the time application for pension is made by individual employees. The purpose of the program was outlined in an issue of the Management News Bulletin and an explanatory letter will accompany each questionnaire as it is sent to a supervisor for completion and forwarding to Employee Benefits Research Section, Schenectady.

As of June 30, 61.4% of Hanford employees were participating in the Good Neighbor Fund which represents an increase of 11% since establishment of the Fund in October, 1952.

Colonel Perry from the National Selective Service Office together with Mr. Henderson from the AEC Washington Office and Captain Chastick, Head of Washington State Selective Service Organization, visited Hanford recently, and in addition to discussion meetings with AEC and GE representatives, Colonel Perry and Mr. Henderson were taken on a tour of the Plant. The primary purpose being to acquaint these people with some of the deferment problems as they relate to technical personnel.

Rating sheets were forwarded to all departments for other than exempt employee ratings to be made during the month of September. Organization and Policy Guide No. 13.5, "Rating Plan - Other Than Exempt Employees", was revised and forwarded to the Manager of Administrative Practices for reissue.

As a result of the President's executive order of July 11 pertaining to the fatherhood deferment revision of Selective Service regulations, a number of telephone calls were made to registrants known to be in a situation affected by the revision to determine if they had notified their Local Boards regarding their anticipated paternity. A number of letters were also written to Local Boards regarding this matter. Also, form letters were prepared and forwarded to all employees on deferment as soon as official notification of the revised law was received.

Employee and Public Relations

EMPLOYEE RELATIONS

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		773
Number of reservists classified in Category A	124	
Number of reservists classified in Category B	62	
Number of reservists classified in Category C	81	
Number of reservists classified in Category D	506	
Number who returned to active duty to date		129*
Number who returned to active duty in July		1
Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	3	
Number of reservists classified in Category D	39	
Delays requested (including renewals)		114
Delays granted		106
Delays pending		0
Delays denied		5
Delay requests recalled		3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		825
Employees registered who are veterans		256
Employees registered who are non-veterans		569
Deferments requested to date (including renewals)		1058
Deferments granted		812
Number of employees for which deferments have been requested		226
Number of employees classified in Category B	0	
Number of employees classified in Category C	2	
Number of employees classified in Category D	224	
Deferments denied and appealed at state levels		7
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		0
Deferments denied by local board and not appealed		5
Deferments denied by state board and not appealed		24
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		85
Deferments requested, later withdrawn		76
Deferments pending		42

*Adjusted figure

Employee and Public Relations

EMPLOYEE RELATIONS

Military terminations since 8-1-1950 are as follows:

Reservists recalled	128
Selective Service	157
Women employees enlisted	<u>5</u>
TOTAL	290

Employees returned from military service:

Reservists	54
Selective Service	<u>15</u>
TOTAL	69

Known number not claiming reemployment rights	7
---	---

Number of employees still in military-leave status	214
--	-----

Suggestion System, Workmen's Compensation and Liability Insurance

	<u>June</u>	<u>July</u>	<u>Total Since 7-15-47</u>
Suggestions Received	177	200	11967
Acknowledgments to Suggesters	157	195	
Suggestions Pending Acknowledgment	38	43	
Suggestions Referred to Departments for Investigation	157	195	
Suggestions Pending Referral to Departments	38	43	
Investigations Completed & Suggestions Closed	274	274	
Suggestions Adopted - No Award	4	1	
Adopted Suggestions Approved by Committee for Award	45	91	
Total Net Cash Savings	\$5,729.80	\$16,146.45	
Total Cash Awards	\$ 615	\$ 2,080	
No. of Suggestions Out for Investigation	601	589	

The highest award of \$300 was made to an employee in the Reactor Section for his suggestion regarding a new method for replacing thermocouples on the rear face of the 105 Buildings. This suggestion resulted in considerable savings in labor.

An employee in the Reactor Section received the second highest award in the amount of \$250 for his suggestion regarding an improvement on the method for reclaiming cadmium lead pieces. Considerable material savings were realized through adoption of this suggestion.

Employee and Public Relations

EMPLOYEE RELATIONS

The third highest award of \$220 was made to an employee in the Metal Preparations Section for his suggestion pertaining to warp gauging and straightening 8" slugs before putting them on the canning line to reduce the number of "no seats". Material savings were realized through adoption of this suggestion.

Workmen's Compensation

On July 23, 1953, Mr. W. D. Smyth and Mr. D. S. Cameron met with representatives of the Department of Labor and Industries to discuss the problem of billing the Department for x-rays and radiologist's services performed by Dr. Edward James. In many instances x-rays have been taken at Kadlec Hospital in connection with Workmen's Compensation cases and sent to Dr. James for interpretation. The Department had refused to honor billings from both General Electric and Dr. James. A mutually agreeable procedure was worked out for submission of the billings in a manner that would be acceptable to the Department. Following the meeting, a discussion was had with Mr. John Shaughnessy, Supervisor of Industrial Insurance, regarding the Department's earlier request that we enter into a modification of our agreement with the Department in order to provide for the forfeiture of our right to protest Workmen's Compensation claims. The request was made in 1952 and at that time we resisted the proposal on the basis that since both claimants and other employers enjoy the right of protest there was no reason why we should give it up. Mr. Shaughnessy advised that the Department did not intend to pursue their request and further stated that by exercising our right of protest we could assist the Department in disallowing claims that do not have merit. In view of those comments it is our thought that the matter may be considered closed.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 64 insurance companies and investigation agencies during the month of July, 1953. This is in accordance with an arrangement with the Underwriters whereby employees on this project might be insured on the same basis as those working elsewhere.

Insurance Statistics

	<u>June, 1953</u>	
Claims reported to Department of Labor and Industries	<u>Long Forms</u> 35	<u>Short Forms</u> 382
	<u>July, 1953</u>	
	<u>Long Forms</u> 29	<u>Short Forms</u> 393

Total Since September, 1946 - 16,649

Employee and Public Relations

EMPLOYEE RELATIONS

	<u>June, 1953</u>	<u>July, 1953</u>
Claims reported to Travelers Insurance Co.	7	* 17
Total Since September, 1946 - 752		

* Of the claims reported to Travelers Insurance Company during the month, 15 were property damage claims and 2 were bodily injury claims.

Training Program - Collateral Contractors

During the month, fourteen KAPL trainees reported to HAPC for an eight weeks training period in the Reactor Section. Two U. S. Navy Hospitalmen also reported here for an eight weeks training course in the Radiological Sciences Department.

Employee & Public Relations

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Rough layout, photograph and preliminary copy for the Community Operations Annual Report (for fiscal year 1953) were prepared by Special Programs and reviewed by the Manager, Community Operations. Suggested revisions will be incorporated into the report, which when completed will be resubmitted to him and to the Manager, Community Real Estate and Services Department for final approval.

At the request of Employee Benefits, 6000 Nucleonics Employees Good Neighbor Fund gummed stickers were ordered.

Lifeline material for the GE NEWS issues of July 3, 10, 17, 24 and 31 was edited by Special Programs prior to publication.

Poster inserts announcing the winning area in the Area Injury Reduction Award plan for July were prepared.

Safety topic for August, "A Neat Way to Work," and the health bulletin for August, "Speak Up!" were prepared, produced and distributed.

Copies of the GE-HAMTC Agreement, which was produced through Special Programs, were distributed to all supervisors. Copies of the GE-Hanford Guards Union Agreement were delivered to Union Relations for distribution.

Copies of GE's "Scrapbook History" were mailed to all employees' homes together with an Employee News Letter signed by the General Manager. Approximately 250 copies were given to Public Relations for distribution to Community Leaders; and another 100 copies were distributed throughout the various booklet racks in the plant.

One hundred copies of "Inside the Atom" booklets were provided to Public Relations.

Five hundred copies of "Hanford's Radiometallurgy Building" were completed and forwarded to Technical Section.

Recruitment advertising for Public Health Nurses was written and placed in two consecutive issues of "The American Journal of Public Health," "Nurses Outlook," and "The American Journal of Nurses" at the request of Employment.

Three new public information racks were designed, fabricated and installed. These racks, modern in design and painted to match the decor of the surroundings, were installed in the lobbies of the 703, 705 and 760 Buildings.

Headlines and rough layouts for two full-page GE ads to appear in a forthcoming special GE edition of the Tri-City HERALD were prepared and photostated at the request of Public Relations.

Two Management NEWS Bulletins were prepared, produced and distributed during the month.

Employee & Public Relations

EMPLOYEE RELATIONS

Special Programs was requested to prepare a brochure for presentation to members of the GE Board of Directors during their Fall visit. The size (approximately 5" x 8"), the contents, and the general layout were developed during the month and approved by the management committee in charge of arrangements.

During the month, two security posters (about 200 copies), and two suggestion system posters (66 copies each) were posted throughout the areas. In addition, 1300 copies of the first in the 52-week series of Elliot Services Company posters were received and distributed. Sheldon-Claire employee relations posters were placed throughout the plant on a weekly basis.

During July, 41 projection engagements were filled by the Special Program's projectionist. In addition, both the projection equipment and the film "A is for Atom" were loaned to various groups frequently. As a result, "A is for Atom" was shown 38 times to approximately 1300 employees.

At the request of Project Section, 5 showings of the 105-C graphite packing film were presented for approximately 325 Project Section people. Also the following films were shown from one to four times: "Principles of Electricity," "Principles of Arc Welding," "Target Nevada," "Fundamentals of Radioactivity," "Properties of Radiation," and "Practical Procedures of Measurement."

"Talk It Over" sessions between supervisor and nonexempt employee on an individual basis were scheduled to be held concurrently with nonexempt employee ratings during September. Preparation of "aids" to assist supervisors in holding these sessions was begun, with distribution planned for early August. Conducting of "Talk It Over" interviews between members of management is being left to individual Departments.

Employee Communications accepted responsibility during the month for obtaining and scheduling training film for plant showings. This service is in addition to the established activity of providing limited projectionist service for film showings.

The last in a series of nine monthly full-page GE NEWS messages on the 9-Point Job Program was developed by Special Programs and published during the month in the GE NEWS. Subject of this message was "Respect for You As an Individual."

During July, Special Programs provided 13 man-days editorial service directed toward assisting in publishing the GE NEWS. This assistance was required due to vacation schedules and illness.

Opening of a First Aid Station in the 700 Area was announced in the GE NEWS with a news story and two photographs with captions prepared by Special Programs.

Atomic Frontier Day publicity was regularly featured in the GE NEWS throughout the month in cooperation with the AFD publicity chairman and in accordance with policy established in years past. Emphasis was given to employee participation in the queen contest and beard growing contest.

Employee & Public Relations

EMPLOYEE RELATIONS

"Buy-Sell-Swap" column appeared in the GE NEWS for the first time in July under the name of "Trading Post." Although employee participation in the column has not been large, reactions to its appearance were most favorable. Many of those submitting listings reported successful transactions.

GE Insurance Plan was publicized in a unique promotional manner in the GE NEWS--through a testimonial letter from an employee. It was photostated and published with an accompanying editorial to show how the employee had benefitted from provisions of the plan.

Safety was approached in various ways during the month, from a half-page of pictures showing good housekeeping, with an accompanying editorial, to a front page picture and caption showing an annual "S" Day being observed in the 300 Area. Special news story also covered the 700 Area winning the Area Injury Reduction award for the second time.

Good Neighbor Fund was publicized in the GE NEWS through unusual photographs showing three people looking at a greatly enlarged copy of a Fund check paid to the Red Cross.

AEC commendation of GE's efforts in the atomic energy program was published in the GE NEWS. Special permission was obtained from the Spokesman Review managing editor to reprint an editorial run by that paper commenting on AEC's recognition of the Company's work at Hanford.

Suggestion System received feature treatment in two different GE NEWS issues during the month. One feature involved an ingenious arrangement of pictures to portray an employee's suggestion. Also, a posed shot was utilized to show that suggestion checks are sent to the suggester, even though he may have left the Company.

How Hanford shares its "know how" with Knolls Atomic Power Laboratory was shown through picture story of 14 men from KAPL here for training in connection with the Company's work on an atomic submarine for the AEC.

Unique vacation of an exempt employee who will spend his vacation in Europe was featured in a GE NEWS "exclusive." Emphasis was given to his being asked to present a technical paper in Stockholm, Sweden, showing foreign recognition of work being done here at Hanford.

New Transportation facilities being constructed to provide better service for Hanford people provided lead material for GE NEWS. Photo, artist's sketch and story were published telling of initial work being started. This story was supplemented in later GE NEWS issue with story of new buses being procured to transport people to and from the Areas.

Communications at Hanford received feature treatment in a GE NEWS double page spread designed to show employees how information is passed on down through a Department until it reaches the employee. Major emphasis was on importance of employee information meetings.

Employee & Public Relations

EMPLOYEE RELATIONS

Latest changes in the draft law were published for the benefit of interested employees. Story was published in cooperation with Employee Services.

GE Purchase Plan was publicized through picture of latest GE appliances for sale at Pleiss-Davis. An AFD queen candidate was shown examining the new GE washer now available.

The art work provided by the Employee Communications commercial artist for the GE NEWS during July included: a two-page photo layout; final art work and layout for a full-page GE NEWS message, ninth in a series of 9-Point Job Program messages; and mounting and retouching of several photographs.

Preliminary visuals of two forthcoming booklets were developed by the commercial artist. The first was for Community Operations Annual Report; the second was for a booklet to be presented to members of the GE Board of Directors.

Rough layouts of two full page advertisements and the cover for a proposed Tri-City HERALD "GE edition" were developed at the request of Public Relations. Also at the request of Public Relations, a GE float for the AFD parade was designed.

Layout and final art work for the August health bulletin and safety topic of the month were developed. A total of nine illustrations were involved.

A proposed Good Neighbor Fund letter head and symbol were designed at the request of Employee Services.

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

Training and Development programs and activities for July 1953 were as follows:

MANAGEMENT AIDS:

MANAGEMENT ORIENTATION, designed to welcome new exempt personnel to the management team, was presented on Monday, July 6, with 11 new exempt personnel attending. Mr. L. F. Huck, Manager of Community Operations and Real Estate, represented senior management at an informal luncheon held at the Desert Inn in Richland.

SUPERVISORS' 10-HOUR PROGRAM scheduled for the week of July 27 to 31 was cancelled due to insufficient enrollment.

POLICY PANEL SEMINAR scheduled for the week of July 13-17 (half days) was also cancelled due to insufficient enrollment. These cancellations are necessary due to peak vacation period.

MANAGEMENT SKILLS:

PRINCIPLES AND METHODS OF SUPERVISION -- One group of 21 supervisors completed the study of the methods during a two-week period July 13-24. This was group #52 which met in Richland. No area group was enrolled this month because Hanford High School is being vacated plus the fact that vacation replacements made enrollment difficult at this time.

CONFERENCE LEADING, which gives the supervisor actual practice and methods of conducting good conferences, was conducted on Tuesday, July 7, with 16 supervisors present. At the request of the Separations Section, Manufacturing Department, this program was conducted in the 200-W Area on Thursday, July 9, with 16 supervisors participating. Again at the request of Community Operations and Real Estate this meeting was presented to 13 supervisors in Dorm W-20, Richland, on Thursday, July 21.

MANAGEMENT DEVELOPMENT:

No Management Development programs have been scheduled during the months of June, July or August because of peak vacation schedules and resultant low enrollment for programs.

OTHER TRAINING ACTIVITIES:

SUPERVISOR'S HANDBOOK: Following is a summary of handbook distribution to date:

Number issued prior to July - 1336
 Number issued during July - 2
 Number returned during July - 8
 Number issued end of July - 1330
 Number on hand end of July - 170
 Total number of handbooks - 1500

Of the 170 handbooks on hand 46 are not usable as they lack too many pages while 116 are ready for issuance and 8 have yet to be checked for completeness.

SAGE -- Survey questionnaires were sent to a representative number of supervisors on O&PG Lists 1, 2 and 3 to determine the degree of acceptance of this one-page information media. Results tabulated and summarized by the Statistics Unit show that the majority of supervisors desire this publication to be continued on a semi-monthly basis and in essentially the same style as before. Whereas all groups were in favor of its continuation, those people on O&PG Lists 1 and 2 were less enthusiastic than those on List 3. Since this publication is maintained for contact supervision, distribution will be made to List 3 only. Another issue was prepared and distributed under date of July 31.

STENOGRAPHIC-SECRETARIAL PROGRAM -- This is a 4-hour program designed especially for stenographers and secretaries to highlight the importance of their jobs, the qualifications that are required in any business, telephone courtesy and techniques, common errors in punctuation and spelling, office manners and personal attractiveness and attitude. During July this program was presented 16 times (from July 8 to July 30) with a total of 262 stenographers and secretaries in attendance.

As a result of the acceptance of this program being carried back to the several offices, requests were received to show the films "Telephone Courtesy" and "By Jupiter" to a group of 33 Cost Accounting personnel on Thursday, July 30, and also for two other showings for other groups during the month of August.

HOBSO II -- On July 1, 2 and 3 all Training personnel participated in a preliminary institute to study HOBSO II. Subsequently new script cards and sequence listing of symbols were received, which makes the learning of the program much easier. Another such institute is planned early in September, after which 4-hour presentations will be scheduled for all supervisors.

REQUESTS FOR MATERIAL -- During the month there were 11 requests for transcripts of programs and 6 requests by supervisors for booklets which we normally distribute in the Stenographic-Secretarial program.

CONFERENCE ROOMS -- The Hanford High School, formerly used for presentation of training programs for area personnel, has been vacated effective July 31. Arrangements have been made to use the conference room located at the Pistol Range (near Hanford) and after re-decorating and minor repairs, Fall meetings will be scheduled at that location.

PUBLIC RELATIONS

During the month of July, the News Bureau issued 65 releases. The breakdown by category, distribution, and content was as follows:

<u>Plant or Company</u>		<u>Distribution</u>	
Adm. and Law	6	Local	25
Plant Services	5	Daily	5
Pay and Benefits	10	Weekly	1
Employment Services	6	Hometown paper	1
Health and Sanitation	3	College paper	1
Technology & Science	7	Trade Journals	2
Military & Civil Protection	2	Company publication	1
Richland & Other Communities	22	Special	29
Good will stories	4		65
	<u>65</u>		

<u>Content</u>	
Information	21
Pictures with captions	3
Short news	27
Long news	12
Feature	2

One of the features mentioned above is a magazine-type story on the boat used by Radiological Sciences to take samples from the river. The story was syndicated to five boat magazines, and by month's end, two had written to ask for pictures to illustrate it.

The other feature was a slightly revised version of the controlled plant growth chamber (climatizer) mentioned in a previous report. At that time, it was sent to a list of farm magazines blanketing the entire nation. This month, it was sent to a list of weekly papers that included all those published in the state of Washington east of the Cascades.

On Tuesday night, July 21, a chemist in Technical Section received contamination on his hair and face while working in a laboratory at 300 Area. A story was gotten from the AP and UP to forestall sensational but erroneous stories. The following week, a TIME magazine reporter called asking for answers to a long list of questions and requested pictures of the employee. The questions were answered completely the day of receipt by telephone and the pictures were mailed the same day.

The Biology Section plant experimentation facilities were visited and plans are now completed for another feature to be syndicated to farm journals and one to be syndicated to Washington weekly newspapers.

A letter was received from a Prosser woman who wanted material to use in arguments with her neighbors. It seems there is still anti-Hanford sentiment in the Yakima Valley. As a result, a long-range campaign is being launched to attempt to counteract this feeling.

The Editor of METAL PROGRESS, who was in charge of the working party of the AEC's Advisory Committee on Industrial Information that visited Hanford, requested an

article on Hanford's new radio-metallurgy laboratory. This article is being written by a member of the Engineering Department.

Work has begun on preparation of the Hanford article for the January issue of the GE REVIEW. This issue will sum-up engineering and technical accomplishments for the calendar year.

The local Tri-City HERALD reporter interviewed the General Manager and the Manager of Manufacturing Department as sources of the first three of a series of about 6 news articles. These will appear in the Tri-City HERALD and will explain, in layman's terms, as much as security permits about the industrial operation at Hanford.

A list of technical and scientific conferences and meetings to be held throughout the country during the next year and a half has been made available to department managers concerned for distribution within their departments.

Persons in charge of displays and exhibits at 8 different Company locations were contacted with the hope of obtaining a display on the theme of the 75th Anniversary which could be set up in Richland. None of the persons contacted were able to provide a suitable exhibit.

A non-competitive float on the theme of the 75th Anniversary is being constructed and will be entered in the Atomic Frontier Days parade.

Photographs and information about the "Olimbizer" used by Radiological Sciences for soil nutrition studies have been accepted by Public Relations Services in Schenectady for use as a Photo News Service subject this fall.

"30 for the Month" for July was distributed to Lists 1 and 2 at Hanford.

The July issue of the Community Newsletter was distributed to Community leaders in Paeon, Kennewick and Richland.

A signed article, "Welding Teflon to Teflon" has been accepted by MATERIALS AND METHODS magazine. A check will be forwarded to the author via Public Relations.

INDUSTRIAL MEDICINE AND SURGERY magazine has returned a signed article submitted previously. This article now will be sent to OCCUPATIONAL HAZARDS magazine.

It was decided to refuse a request from a free lance writer for three papers written and prepared by Hanford authors. The reason for the refusal is the belief that papers and articles by Hanford authors should be placed directly with magazines, if possible, so that any payment that is made will go to the author. Hereafter, free lance writers will be provided with papers only after efforts by Public Relations to place the paper directly have been exhausted.

Requests for 12 copies of "How to Write an Article for the GE REVIEW" have been received from various persons at Hanford. The request for this paper came as a result of an offer which appeared in "30 for the Month". Those who requested copies will be contacted in the future and will be asked to complete the articles they have promised.

Nine papers were received, reviewed, and cleared for presentation or publication, during the month. Five were for presentation at the Conference of Nuclear Engineering at Berkeley, California, on September 9-11. They are as follows:

1. "Principles and Philosophy of Reactor Control Circuits," by I.M.A. Garcia.
2. "Instrument Improvements for Hanford Type Reactors," by J. E. Kaveckis.
3. "Maintenance Work in the Field of Nuclear Energy," by K. K. Campbell.
4. "Development of Equipment for Handling Radioactivity," by K. H. Hammill.
5. "Slug Constants for Inhomogeneous Piles" by W. A. Horning.

Other papers presented for clearance were:

1. "Improved Trigger Circuits for Automatic Titrations", by W. N. Carson, Jr., for publication in "Analytical Chemistry" at a later date.
2. "Iodine Yesterday and Today," by Leo K. Bustad, for presentation to the Staff of the Royal Veterinary College at Oslo, Norway, August 18, 1953.
3. "Isotopes in Biology and Medicine," by Leo K. Bustad, for presentation to the Annual Meeting of the Norwegian Veterinary Medical Association at Lillehammer, Norway, August 20, 1953.
4. "Studies of Metabolic Turnover with Tritium as Tracer, III Comparative Studies for Tritium and Dueterium" by R. Thompson and J. E. Ballou, for publication in the "Journal of Biological Chemistry" at a later date.

A total of 150 photography assignments were covered during the month of July. A total of 16,937 prints were produced, of which 13,338 were "A" and "B" badge prints. A total of 3,599 prints were area and news work.

Motion picture film was exposed during the month on three individual motion pictures as follows: 2,200 feet (B&W) for 100-K Construction; 100 feet (B&W) for AEC; and 1,500 feet (color) for Orientation, all 16mm film.

Projection equipment loans during the month included the 35mm Golde projector and screen, four times; 35mm sound slide projector and screen, four times. Special Programs Unit used the 16mm projector daily during the month of July, and loans for evening use totaled six times.

Three rolls of contraband films were processed for G. E. Security. A total of 520 8"x10" prints were produced for Process Engineering, Reactor Section. Normal procedure is for printing to reproduce photographs in large quantities. In this case, however, it was necessary for the Photography Unit to complete this request because of the fine detail required.

"105-C Graphite," the feature-length 16mm training-documentary motion picture produced by Public Relations for Design Section has been completed and a special preview showing was held for the customer on July 23. Over 100 members of management personnel, Atomic Energy Commission officials and others connected with the production attended the showing. It has since been shown in several Engineering Department Units and at 2101 and 100-K Areas. Comments received were very complimentary, especially to the effect that the film appeared to be excellent for its intended training purposes.

Full-scale production on the Orientation motion picture in 16mm color, being produced by Public Relations for Employee Relations, was begun the week of July 27. About 2000 feet of film has been exposed on opening sequences that include Hanford, desert, trailer camps, perimeter barricade traffic flow, and North Richland business district. It is planned to have all exterior work completed by August 15 to take advantage of ideal weather conditions.

An answer print of the Minor Construction training motion picture, "Getting the Job Done!", was shown to the Manager of Project Section, Engineering Department, and his staff in addition to other Department heads that included the Legal Department Manager. This was the completely edited version with synchronized sound track, one step removed from the final version. The showing was held to enable this audience to make any final changes in the film scenes or script. The comments that followed were very complimentary to the production staff and only minor technical changes were requested. The finished print of the film is expected within the next week or ten days and will be shown to the General Manager and his staff before it is used in the training program.

The Atomic Energy Commission's Savannah River Operations Office inquired, through the Hanford Operations Office, as to the possibility of purchasing a print of the motion picture "Radiation Hazards Control" produced by Public Relations for Manufacturing Department last year. They wish to review the print first, and a tentative showing has been arranged for local Atomic Energy Commission officials to review it along with the other films which have been produced by this Section. Atomic Energy Commission Health Physics officials stated they are contemplating another meeting to be held at the University of Washington for the American Society of Engineering Education and want all films produced at Hanford to become an important segment of the curriculum.

A meeting was held with members of the Design Section relative to producing the first section of the 100-K area film. This means putting together the first three 400-foot reels of the 16mm training-documentary motion picture footage taken so far on the construction of the 100-K Area. Produced by Public Relations for Engineering Department, the film will serve as a graphic document of all exterior construction and be used as soon as possible for training purposes. In the meantime photography is continuing, including special air views done through the cooperation of the Atomic Energy Commission Security Division. Processing of the film remains suspended until authorization is received from the Atomic Energy Commission to proceed with Contract arrangements as recommended by the Company.

A request has been received from Design Section, Engineering Department, for an estimate on costs to produce a finished motion picture on the subject of pre-packing to serve as a sequel to the "105-C Graphite" motion picture recently completed by Public Relations for them. Both silent film and sound-on film are being considered, utilizing the unused footage from "105-C Graphite".

Arrangements were made as a public service to the American Legion, and with AEC approval, to supply public address equipment, including the mobile unit, for the July 4th celebration in Richland. The Richland Junior Chamber of Commerce has received approval to use the sound truck and public address equipment for the Atomic Frontier Days celebration sponsored by them. Also, Public address equipment was set up and provided the Little League tournament.

The General Electric film "A is for Atom" is proving popular and has been on a continuous booking for showings at both plant and community groups. Five showings by Public Relations included one at Pasco before the Pasco Kiwanis Club and one at Kennewick. The local Atomic Energy Commission offices are preparing to purchase two prints of this film to fill region-wide requests for Atomic Energy subjects.

Eighteen films were obtained from the General Electric Company and other approved sources for showings in training and information groups within the plant. During the first six months of 1953 over 50 of these films were obtained for plant use by Public Relations.

See attached statistical report for Hanford Photography Unit work during July.

MONTH OF JULY, 1953

COMMUNITY OPERATIONS &
REAL ESTATE DEPT.

Commercial Services

Fire

Police

Public Library

EMPLOYEE & PUBLIC RELATIONS

Employment

News Bureau

Special Programs

Training

G. E. News

Technical Personnel

ENGINEERING DEPT.

Fuel Technology

Design & Construction

Minor Projects

Technical

Pile Technology

Project

MEDICAL

Public Health

MANUFACTURING DEPT.

Plant Engineers

Power & Maintenance

Reactor Section

Separations Section

Radiation Monitoring Unit

Metal Preparations

Process Sub Section

RADIOLOGICAL SCIENCES DEPT.

Radiological Engineering

Records & Standards

Biology

PLANT AUXILIARY OPERATIONS

Security

Traffic

Administration Area Maintenance

MISCELLANEOUS

A.E.C. Safety

A.E.C. Security

A.E.C. Engineering & Construction

TOTAL:

Total Assignments

Total Negatives

Total Prints

	2"	4"	7"	10"	5"	14"	E	G.	Color	Slides	Slides	chrome
COMMUNITY OPERATIONS & REAL ESTATE DEPT.												
Commercial Services												
Fire				28			17					
Police		88	65	4			2					
Public Library			4	17	18		134					
EMPLOYEE & PUBLIC RELATIONS							6					
Employment	1,160						232					
News Bureau		54	10	64		1	20					
Special Programs			4	111	32		84					
Training		12		7			3					
G. E. News		6	30	125	26	2	166					
Technical Personnel				11	35		7					
ENGINEERING DEPT.												
Fuel Technology				75	215		16					
Design & Construction				94			7					
Minor Projects				16			2					
Technical				3	6		84					
Pile Technology		23		108	147	7	10					
Project				18			2		28			
MEDICAL				2			11					
Public Health										4		
MANUFACTURING DEPT.												
Plant Engineers				12	432		70					
Power & Maintenance				4			4					
Reactor Section				44			3					
Separations Section				52			19					
Radiation Monitoring Unit				35			11					
Metal Preparations				28			13					
Process Sub Section				520								
RADIOLOGICAL SCIENCES DEPT.												
Radiological Engineering				30								
Records & Standards				12			1		50	4		
Biology				6								
PLANT AUXILIARY OPERATIONS												
Security	5,977	6,161		66	24		303					
Traffic				35			7					
Administration Area Maintenance				166			84					
MISCELLANEOUS												
A.E.C. Safety				68	34		34					
A.E.C. Security	40	12	24				21		10			
A.E.C. Engineering & Construction			27									
TOTAL:	7,177	6,856	164	1,761	969	10	1,377		88			
		MAY			JUNE				JULY			
		179			199				150			
		1,424			1,711				7,276			
		21,982			20,551				26,937			

Employee and Public Relations
Technical Personnel Section

TECHNICAL RECRUITING

During this month we have added to the rolls six exempt employees and one non-exempt, all hired earlier. We are continuing to seek a few specialized people and have made one offer to a very capable Ph.D. Chemical Engineer.

We are participating in Company-wide plans for Ph.D. recruiting as well as MS-BS recruiting at the colleges. Even though our needs in numbers promise to be small, it seems advisable to maintain our contacts with the graduate schools and their students; therefore, we plan to participate in some of the Ph.D. recruiting visits this fall.

For MS-BS graduates a tentative program has been planned involving visits to about twenty colleges as compared with thirty-six visited last year. More intensive concentration on these schools should enable us to attract a small number of the best men. In the absence of any firm quota our plans are based on an assumed quota of fifty. More emphasis will be placed on recruiting veterans and less on recruiting young graduates whose military service lies ahead. Toward this end, our recruiting booklets are being reviewed and revised.

TECHNICAL PERSONNEL TRANSFERS AND LOSSES

Resignations	4
Remaining at present jobs	5
Transfers to other Divisions	1
Transfers within HAPO	2

Where employees contact us, either at their own decision or at the request of their supervisors, we are trying to acquaint them with the much tighter employment situation which exists today and help them to realize their present opportunities. In a few cases we have urged young technical employees to look outside the Company, if their qualifications did not signify much prospect for advancement.

EDUCATION

The program of technical and business courses to be offered in the fall is almost completely planned, including a new thermodynamics course "Heat Power Cycles" and a new course in radiobiology. A few courses at college-level are also planned for employees who do not have college degrees, and these courses would replace those formerly available through the State College Extension Division.

EMPLOYEE AND PUBLIC RELATIONS
Technical Personnel Section

ROTATIONAL TRAINING PROGRAM

The orientation program for the new graduates was carried out successfully. The Alumni Societies of the several universities have nearly all had meetings to welcome the new graduates. All of these men now have security clearance and are on rotational assignments.

MISCELLANEOUS

During this month a preliminary proposal was formulated covering a training program for engineering aides, laboratory assistants, and radiation inspectors. This study is based on information gained regarding analogous programs in the Company's eastern plants and it has been considered in a preliminary way with Mr. Lail and Mr. Callahan.

Employee and Public Relations

SALARY ADMINISTRATION

GENERAL

Salary survey data compilation and analysis were completed during July, and the survey reports were sent to Printing. Reimbursement authorization requests were being prepared for presentation to the Commission.

Evaluation of position descriptions was brought up to current status during July, and the first phase of the long-range organization analysis was well underway. Major departments had been contacted in gathering any recommendations and planning which has already been done, to incorporate this thinking into the analysis.

ANNUAL SALARY SURVEYS - NATIONAL AND WEST COAST

The analysis of the survey data for 1953 shows that salary increases granted by the participating companies up to the time that the data was submitted had not entirely equalled the general adjustments which had been granted at Hanford. As a result, some minor adjustments in base salary controls are being considered. The reimbursement authorization requests presenting these recommendations for Commission approval were being prepared at month end.

POSITION EVALUATION AND REVIEW

During the month position evaluation was brought up to a current status, dealing with organizational changes as presented. A continuing program for field review of positions was in progress.

ORGANIZATION ANALYSIS

The first phase of long-range organizational study and planning was essentially completed. Major departments were interviewed so that current recommendations and planning from these departments could be incorporated into the overall scope of the problem. There is, of course, considerable work required between this first phase and the completion of this assignment.

RECONCILIATION OF HANFORD SALARY LEVELS INTO COMPANY STRUCTURE

The Manager of this Section spent July 23 and 24 in New York with representatives from General Engineering Laboratory and several other components of the Atomic Products Division. This was in continuation of reconciling and identifying Hanford positions and levels within the overall Company salary plan. This will be a considerable aid to Hanford in being able to cross identify positions and in surveying Company salaries relative to those at Hanford Atomic Products Operation.

Employee and Public Relations

Union Relations

UNION RELATIONS - OPERATIONS PERSONNEL

A strike of 3500 AFL production workers in the X-10 (research lab) and Y-12 (radioactive isotopes) plants at Oak Ridge occurred on July 27. The picketing involved in the action also idled another 6,000 construction workers but was ignored by the 3500 CIO production workers employed in the gaseous diffusion plant.

The contract with the AFL Council (practically identical to the setup at Hanford) provides for a specified period of time in wage negotiations following which a strike is permissible. This period expired on July 15, but was extended to July 26 by mutual agreement. The strike followed a collapse of negotiations in which the Council sought a 15¢ (Press indicated 10 $\frac{1}{2}$ ¢) per hour increase, plus 2 additional holidays. The Company offer was for a 5¢ increase with one additional holiday (would bring total to 7).

Both the AEC and the FMCS sought to have the new panel take jurisdiction in the dispute but met a rejection by the Union even though Panel intervention was acceptable to Carbide. There appeared to be a reasonable possibility that the President would seek a Taft-Hartley injunction when a return to work was effected on July 28 by a joint wire from Durkin and Strauss which requested the parties to return to work and resume negotiations. No mention was made in the wire of the Panel or Taft-Hartley.

Panel representatives were scheduled to be in Oak Ridge on July 29 for the purpose of aiding in the settlement of the dispute, and the question exists as to whether they will "mediate and conciliate" or "find facts and recommend."

Our New York Office is in constant touch with the situation and this office has been assured that a summary of the entire incident will be provided to HAPCO when the matter is finally resolved and evaluated.

We have been informally advised by the HAMTC that unless R. A. Carlson is reactivated in his former position as a Railroad Conductor, the matter will be taken before the NLRB as an unfair labor practice charge. Our position in this regard is considered to be sound. However, in view of the fact that the Council has submitted letters from three local doctors (Kendall, Richland; Freund, Kennewick; and Klopfenstein, Pasco) which pronounced Carlson to be in good physical condition, a further review of the matter with Medical is contemplated.

Formal acceptance of the current wage offer was received from the HAMTC, BSEIU, and HGU on July 9. Definitive contracts with all bargaining units, including Community Firemen, were executed on July 10. The increase on a current basis will be included on weekly salary checks of August 7, the retroactive portion of the increase to be paid on August 21. Both the current and retroactive portions of the increase will appear on monthly salary checks on August 31.

Employee and Public Relations

The Cisco Construction Company (nonunion contractor) has been awarded a \$172,000 contract to construct underground piping, pumping houses and transformer stations, in addition to installing pumping equipment and pumping lines in the North Richland well field area. The contract includes the tying in to existing facilities and there should be no overlap of work between GE and Construction personnel. In view of the reluctance on the part of GE Plumbers to perform tie-ins on a recent Cisco job, discussions have been had with the Council business representative and the chief steward of the Plumbers, at which time they were informed that the Company would con-
tenance no refusal to perform work associated with this job and that any such refusal would be met with disciplinary action. We receive assurances that every effort would be made to avoid such an incident.

Copies of the HAMTC-GE Agreement in printed pamphlet form were distributed to all supervisory personnel on the project. Distribution of the HGU-GE pamphlets was made to interested parties.

By letter of July 7, the Council advised us of a desire to open the HAMTC-GE (Firemen) Contract for modification. The July 9 letter from the Council accepting our wage offer, of course, precluded any contract negotiations until June 10, 1954. However, for the sake of uniform payroll administration, we have drafted a revised agreement incorporating into the Community Firemen Contract the applicable provisions recently negotiated with other bargaining units. This draft has been reviewed by Legal, Financial, and Community Departments and is ready for presentation to the Council. It is not our intention to enter into any negotiation on subjects not covered by the existing HAMTC Agreement.

An "Order of Dismissal with Prejudice and without Costs" in the R. E. Mercer case was issued by the Benton County Superior Court on July 10.

Unofficial information from the field indicates that the Council has received a determination from the Metal Trades Department, AFL, setting forth the jurisdiction of the Instrument Guild. The letter is reported to restrict the Guild's jurisdiction to the "manufacture and maintenance of instruments and gadgets." Although this has not come to us through official channels, there is reason to believe that the rumor is well founded. Such an edict from the Metal Trades Department would obviously restrict the work assignments of our Instrument people but, as is the case in most attempts at jurisdictional settlements, it creates as many problems as it resolves.

President Eisenhower has appointed four members of the 6-man Labor-Management Relations Panel to handle labor-management disputes in AEC installations:

Cyrus Ching	-	Chairman
Arthur Ross	-	University of California
Philip Weiss	-	Detroit
Thomas Holland	-	Miami University

It is expected that the remaining two members will be selected by Whitley P. McCoy, new Director of the FMCS.

Employee and Public Relations

Guy Farmer, Washington attorney and former Associate General Counsel of the National Labor Relations Board, has been named to take over the unexpired term of retired NLRB Chairman Herzog. His term will expire on August 27, 1955. Farmer becomes the first Eisenhower appointee on the Board and his appointment has been confirmed by the Senate.

The Senate has confirmed Whitley P. McCoy as Director of the Federal Mediation and Conciliation Service to succeed David L. Cole. McCoy is a 59-year-old Eisenhower Democrat who was a Professor of Law at the University of Alabama, with experience as an arbiter, mediator, and NLRB trial examiner.

The Republican administration moved a step nearer to a Republican-controlled NLRB with the appointment of a second member of the GOP, Philip R. Rodgers, now staff director of the Senate Labor Committee. If confirmed by the Senate, Rodgers will take the place of John M. Houston when the latter's term expires on August 27. That will give the Board two Republican members, two Democrats, and one independent.

Grievance Statistics:

Three meetings were held during the month for the purpose of processing grievances at the Step II level.

Status of Grievances

	<u>Unit</u>	<u>1953</u> <u>Nonunit</u>
Received this month	17	2
Received this year	187	22
Settled at Step I this month	12	1
Settled at Step I this year	72	15
Pending settlement at Step I at end of month	0	3
Settled at Step II this month	2	0
Settled at Step II this year	79	3
Pending settlement at Step II at end of month	223*	1
Brought to arbitration during the month	0	0
Pending settlement by arbitration	9**	0
Total number pending settlement	232	4

*Includes 169 bargaining unit grievances brought to Step II by the Union prior to January 1, 1953, but not scheduled for Step II processing by the Union to date.

**Includes 8 grievances brought to the arbitration level by the Union prior to January 1, 1953, but no further action has been taken by the Union to date.

Employee and Public Relations

Analysis of Grievances Received this Month

<u>Department</u>	<u>Unit</u>	<u>Nonunit</u>
Manufacturing Department		
Reactor Section	7	1
Separations Section	4	0
Metal Preparations Section	1	0
Total for Department	<u>12</u>	<u>1</u>
Plant Auxiliary Operations Department		
Plant Protection Section	2	0
Electrical Distribution & Telephone Section	2	0
Transportation Section	1	0
Total for Department	<u>5</u>	<u>0</u>
Radiological Sciences Department		
Radiological Records and Standards Section	0	1
Total for Department	<u>0</u>	<u>1</u>
Engineering Department	0	0
Financial Department	0	0
Community Operations & Real Estate Department	0	0
Medical Department	0	0
Legal Department	0	0
Employee and Public Relations Department	<u>0</u>	<u>0</u>
GRAND TOTAL	17	2

Subjects Covered by Grievances

<u>Unit</u>		<u>Nonunit</u>
Jurisdiction	8	Hours of Work 1
Health-Safety-Sanitation	2	Wage Rates 1
Hours of Work	1	
Sick Leave	1	
Seniority	1	
Wage Rates	2	
Subjects not covered by Contract	<u>2</u>	
Total	17	Total 2

Employee and Public Relations

CONSTRUCTION LIAISON

For several years, the Teamsters have been making overtures in negotiations for isolation payment to Bus Drivers who begin their workdays in North Richland, haul workers to the job site, perform their eight-hour work assignment in the field, and again haul the workers back to North Richland in the evening. Overtime for the bus driving duties is based on the rate for the classification under which the individual works during his regular schedule of hours. The union apparently is bringing this matter to a point of issue at this time and has proposed arbitration. The Contractors are reluctant to agree to arbitration and are currently engaged in an exchange of correspondence regarding the issue.

The Plumbers' refusal to dispatch men to Blaw-Knox, because of the discharge of four foremen and one general foreman who refused to instruct their men to handle certain piping material unless an expeditor rode the truck from the warehouse to the site of the work, was terminated on July 13. Blaw-Knox had received no men since June 5. According to our information, Blaw-Knox agreed to reinstate the four foremen (not the general foreman) and to use expeditors in the hauling of piping material under certain conditions.

A jurisdictional dispute between Carpenters and Sheet Metal Workers over the installation of metal partitions in the 2101 Building resulted in a work stoppage on July 2. By July 3, this strike had spread to include all Sheet Metal Workers on Kaiser's payroll. A return to work was effected on July 8. The strike was termed a "wildcat" by the local union and the period from July 2 to July 8 was purportedly necessary to get the men back on the job.

On July 3, eight of the approximately 100 Millwrights employed by Kaiser in the 2101 Building laid down their tools in protest over the assignment to Machinists of changing cutters on a milling machine. The May 11 recommendation of the FMCS special panel provided that the two crafts would work together in a joint operation when performing this assignment. The issue was temporarily resolved on the basis that Millwrights would perform the work and the Machinists would stand by to "featherbed" the operation. The issue again became apparent on July 22, at which time approximately 125 Millwrights walked off the job refusing to share the work with the Machinists. On July 23, the union posted pickets at the construction bus lot which effectively halted all construction work on Kaiser projects. The pickets were removed on July 24 which permitted a resumption of construction activities but the strike continued in the 2101 Building until July 29, at which time the men returned to work. Terms of settlement, which were accomplished at a meeting of international representatives in Oakland, are not known at this time. John Dunlop, acting outside his official capacity as Chairman of the National Joint Board for the Settlement of Jurisdictional Disputes, participated in these discussions.

Employee and Public Relations

Father Robert J. Carmody, Seattle University Professor, acted as impartial arbitrator to a dispute between Kaiser and the Carpenters over the application of the \$1.00 per day travel allowance for new employees on the day they process through employment. The decision of the arbitrator in this case upheld the Company's position.

The Pasco Building Trades Council has posted a picket at the site of the Cisco job in North Richland which consists of the construction of a new wing to the hospital. The picketing has been confined to the work area and thus far has not interfered with the ingress and egress of construction workers taking physical examinations at the hospital.

We are informed that Cronkite (Cisco) has contacted Charlie Knapp of the Building Trades Council seeking men from union sources. The letter is construed as a conciliatory gesture and Knapp's reply stated that they bore no grudges and would be happy to dispatch men if Cisco settled their differences with the Plumbers. There appears to be a reasonable chance that Cisco will endeavor to accomplish this if the Plumbers' price for peace is not too demanding.

A Hanford Addendum to the Asbestos Workers' Agreement expired July 1. The Union has refused to renew the contract and has refused to dispatch men under any conditions that differ from their Area Agreement. This would mean less money per hour than they have been receiving but would be more advantageous over-all because of the travel and subsistence provisions. Meanwhile, no men are being dispatched to the project.

Included in the demands upon the Employers in current negotiations is a request for time and one-half for all work performed under SWP conditions. This demand was later modified to "onerous pay" rather than "hazard pay" on the basis of such a premium purportedly being in effect at Los Alamos. An investigation of this premium pay plan by a union and a contractor representative disclosed a premium payment ranging from 10% to twice the regular rate of pay according to the work being performed. In view of the potential seriousness of this demand, this office has made very effort to fully inform the Contractors' Committee of the history of this issue at Hanford and elsewhere in the atomic energy program. We likewise offered the services of this office and Radiological Sciences if further information was desired to fortify their arguments. The matter has been brought to the individual attention of the AEC, several Contractor representatives, and to the Project Manager of the Minor Construction forces. The latter, whose forces are primarily concerned with this type work, has not to date participated in negotiations with the Union and it has been suggested that he be present at future discussions.

Project has reached agreement on a new Schedule "A" for the Operating Engineers which conforms to the contract negotiated by the AGC in Spokane. The contract runs to January 1, 1955, and provides wage increases approximating 19¢ per hour. Effective June 1, wages in each classification are rounded off to the nearest 5¢ and the 15-cent-per-hour increase is added to this figure. The health and welfare plan involving an employer contribution of 7½¢ per hour was granted effective July 1, 1954.

Employee and Public Relations

WAGE RATES

Reimbursement Authorization No. 207, covering changes in rates for all non-exempt weekly-paid employees and Community Firemen, was received from the Atomic Energy Commission. This reimbursement authorization gives approval for adjusting base rates on a prescribed formula and applying a 12.0 per cent "adder" factor to the adjusted June 10, 1953, base rates.

Reimbursement Authorization No. 208 was received from the Atomic Energy Commission for the establishment of the classification of "Financial Analyst", Grade 22. This Authorization also gave approval for an increase in the job rate of the classification of "Dispatcher (Electrical)", together with the establishment of a merit plan for increases to be given at not less than nine-month intervals in accordance with specific steps.

Reimbursement Authorization No. 210 was received from the Atomic Energy Commission for the establishment of a new classification entitled "Standards Technician", Grade 21, applicable to individuals in the Metal Preparation Section.

The Wage Rates Unit participated in wage surveys conducted by the Argonne National Laboratory in Chicago; the National Lead Company in Cincinnati; and a survey of civilian wage rates conducted by officials of Camp Hanford, U.S. Army.

Copies of the internal Northwest Area Wage Rate Survey were distributed to management in Richland, New York, and Schenectady. This survey shows the HAPC relative position with rates paid throughout the Northwest Area.

Personal visits were made to some twenty concerns throughout the country to gather information on the classification and evaluation plans covering individuals performing semitechnical work comparable to that assigned our Laboratory and Engineering Assistants. This information is being compiled and will be distributed to a committee now studying this specific classification problem.

A survey was made to determine the prevailing rates paid individuals performing work comparable to the duties of our Wire Chief. As a result of this study, it was determined that the existing HAPC rates should not be changed.

A proposed revision of craft classifications involving the elimination of the classification of "Helper" and the lengthening of the "Trainee" progression schedule was submitted to representatives of specific crafts, with the explanation that such a plan could not be effective unless all crafts approved the proposed move.

Employee and Public Relations

Bickering between the craft workers and technical groups continued during the month with the Union complaining in several instances that engineers or semitechnical nonbargaining unit employees were performing craft work. Investigation revealed that occasionally technical workers had overstepped craft boundaries.

Two hundred ninety-two (292) automatic increases and nineteen (19) merit increases were processed during July. Requisitions for one hundred thirteen (113) prospective employees and Additions to the Payroll for eighty-three (83) new employees were approved. Review for proper classification, rate, etc., was made for twenty (20) reactivations, one hundred sixty-nine (169) reclassifications, two hundred fifty-three (253) temporary reclassifications, one hundred seven (107) transfers and five (5) transfers from the exempt roll.

COMMUNITY OPERATIONS AND
REAL ESTATE DEPARTMENT
MONTHLY REPORT SUMMARY
JULY, 1953

ORGANIZATION AND PERSONNEL

Number of employees on roll:	<u>SUFFIX</u>	<u>BEG. OF MONTH</u>	<u>END OF MON</u>
General Administration	310	5	4
<u>Community Operations Section</u>			
Administration	340	3	3
Engineering	341	9	9
Public Works General & Utilities	342	30	29
Public Works Labor Crews	343	57	56
Recreation & Civic Affairs	344	5.5	5.5
Library	345	10	11
Fire	346	67	66
Police	347	51	51
Electrical System	348	<u>20</u>	<u>21</u>
Sub Totals		252.5	251.5
<u>Community Real Estate Section</u>			
Administration	350	3	3
Housing Rental	351	23	23
Maintenance	353	151	166
Commercial Property	357	<u>12</u>	<u>12</u>
Sub Totals		189	204
<u>Civil Defense Program</u>	360	<u>1</u>	<u>1</u>
GRAND TOTALS		447.5	460.5

Net increase of thirteen in the number of employees in the department during the month of July, 1953.

GENERAL

The financial operating report for the fiscal year 1953, which was released on July 23, showed an operating "profit" of \$525,083 as compared with a budget of \$362,564. This was the result of a budget underrun of \$169,519, of which \$79,634 was in the Community Operations, \$73,260 was Real Estate, and \$9,630 was for steam and other. The work program for the department was completed as budgeted and the underrun was occasioned by economies effected during the year.

Two additional wells were placed in service in the domestic water system on August 5 and 6. Satisfactory production from one well has not been achieved and an attempt is being made to increase its production.

At the request of several interested parties, bids were invited for the installation and operation of a second community television system in Richland.

Five new sublessees of privately-owned commercial buildings opened for business.

Custody of three Government-owned buildings in the Light Industrial Area was transferred to the Real Estate Section for commercial leasing.

Total housing applications pending - 528.

HARoot:dp
8-12-53

COMMUNITY OPERATIONS SECTION

SUMMARY

JULY 1953

ORGANIZATION & PERSONNEL:

	<u>BEGINNING OF MONTH</u>		<u>END OF MONTH</u>	
	<u>Exempt</u>	<u>Non-Exempt</u>	<u>Exempt</u>	<u>Non-Exempt</u>
ELECTRICAL	4	16	4	17
PUBLIC WORKS	13	74	12	73
RECREATION & CIVIC AFFAIRS	3	2 1/2	3	2 1/2
LIBRARY	4	6	4	7
POLICE	18	33	18	33
FIRE	67	0	66	0
ENGINEERING	<u>6</u>	<u>3</u>	<u>6</u>	<u>3</u>
	115	134 1/2	113	135 1/2

The Community Operations Section enjoyed a budget underrun of \$79,634 for FY 1953. This reduction of operation cost was spread throughout the entire Section and not concentrated in one function. It was realized primarily by operating efficiencies without reductions in service. Although employees have been added to the Community Operations Section to perform new responsibilities assumed during the year, in the performance of similar functions the Section utilized 26 fewer employees on 7-1-53 than on 7-1-52.

Two additional wells were placed in service on the domestic water system on August 5 and 6. Satisfactory production from one well has not been achieved, and an attempt is being made to increase its production.

RICHLAND ELECTRICAL UNIT
MONTHLY REPORT

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees beginning of month	<u>4</u>	<u>16</u>
Transfers in	<u>0</u>	<u>1</u>
Transfers out	<u>0</u>	<u>0</u>
Terminations	<u>0</u>	<u>0</u>
Total end of month	<u>4</u>	<u>17</u>

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	<u>14</u>
Anchors set and guys installed	<u>0</u>
Street lights repaired and steel mast arms installed	<u>7</u>
Street lights relamped - Mercury Vapor	<u>1</u>
Street lights relamped - 6000L and 4000L, 1100 Area	<u>122</u>
Street lights relamped - 6000L and 4000L, 700 Area	<u>4</u>
Flood lights relamped, 1100 Area	<u>35</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>25</u>
Transformer KVA removed	<u>25</u>
Net transformer KVA installed	<u>0</u>
New services installed - residential	<u>3</u>
New services installed - commercial	<u>2</u>
Temporary services installed and removed	<u>2</u>
Scheduled outages - primary	<u>4</u>
Scheduled outages - secondary	<u>0</u>
Unscheduled outages - primary	<u>0</u>
Unscheduled outages - secondary	<u>0</u>
Standby and escort	<u>3</u>
High voltage tree trimming	<u>32</u>
Low voltage tree trimming	<u>26</u>

TRAFFIC SIGNALS

Relamping	<u>1</u>
Operational failures	<u>5</u>
Installations	<u>0</u>
Removals	<u>0</u>
Routine maintenance checks	<u>27</u>
Routine check R.R. signal at Van Giesen	<u>5</u>
Total signals in operation - automatic	<u>16</u>
Total signals in operation - manual	<u>3</u>

RICHLAND ELECTRICAL UNIT

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation	<u>26</u>
Electrical motors checked and serviced - water	<u>21</u>
Electrical motors checked and serviced - sewage	<u>16</u>

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	<u>3</u>
Outside circuit checks	<u>7</u>
Inside faults repaired	<u>5</u>
Outside faults repaired	<u>6</u>
New circuits placed in operation	<u>0</u>
New boxes placed in operation	<u>0</u>

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	<u>6</u>
" " " " " " - BB1S2	<u>6</u>
Secondary and pad located stations -	<u>22</u>
Checked jumpers, cutouts, grounds and general condition	

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Voltage and load checks	<u>7</u>
Meters tested - customers' requests	<u>3</u>
New meters shop tested	<u>24</u>
Faulty meters replaced	<u>10</u>
Damaged meters and covers	<u>7</u>
Residential read-ins	<u>227</u>
Residential read-outs	<u>106</u>
Residential disconnects	<u>6</u>
Residential reconnects	<u>5</u>

Note: Consumption and revenue reports, under IBM operation, are not available until the 18th of following month. June 1953.

Consumption and revenue:

	<u>No. of Meters</u>	<u>KWH</u>	<u>Revenue</u>
Schedule 1 - Residential	6,167	3,678,509	\$41,292.80
Schedule 2 - Commercial			
Class 1 - (In lease)	71	759,433	6,999.32
Class 2 - (Pay on meter basis)	142	363,857	4,688.04
Class 3 - (Plant Adm.) Comm. rate	6		
1131 Bus Lot		60,000	485.00
Kadlec Hospital		63,000	510.00
Stores Excess & Salv.		32,700	333.50
Central Stores		54,720	528.60
Public Health		2,640	29.30
700 Area		360,000	2,307.00

RICHLAND ELECTRICAL UNIT

	<u>No. of Meters</u>	<u>KWH</u>	<u>Revenue</u>
.005 Rate - metered	4		\$
Army Dike 1 & 2		5,760	28.80
Medical - Dental Bldg.		10,440	52.20
Public Library		6,040	30.20
Central Fire Station		4,380	21.90
.005 Rate - unmetered - est.			
1125 Warehouse		10,000	50.00
AEC Airport		15,000	75.00
Comm. Administration		<u>724,774</u>	<u>3,623.70</u>
Total	6,390	6,151,253	\$61,055.36

CALL OUT -- Total weekly paid time - 16 MH
Total monthly paid time - 6 MH

UNUSUAL INCIDENTS - None

COMMENTS

Removed telephone cable from pole line from rear Village Theatre running west to old nursery site, as requested by work order from Telephone Section.

N-1 Area made primary connections to two remaining transformers and connected ten services as requested by AEC work order.

North Richland well field was connected to Richland primary system by performing necessary switching.

Both N-1 and N-2 Areas were officially accepted after inspection by AEC, contractor's agent and Electrical Unit. Operating responsibility assumed by Community Operations Section.

Street lighting circuits #200, 900 and 1400 were rearranged to provide capacity for nine Mercury Vapor lights soon to be added to 1400 circuit.

Substation fence grounding installed by contractor was inspected, accepted and assumed by Community Operations.

Additional transformer capacity was installed near Building 705 to relieve existing overloads and relieve voltage drop to that area.

Installed ten new poles and rearranged and transferred existing circuits to new poles to remove rotted poles and provide better operating conditions on Benham Street between Duane and George Washington Way. Primary lines were transferred with hot-line tools to minimize outages to tenants.

Arranged outage for two hours on Hunt Avenue to remove leakages causing radio interference and tighten equipment on structures.

Arranged outages for two hours to area near Bomber Bowl to replace broken insulators caused by thrown rocks and rifles. Tightened hardware, which was also causing radio interference.

RICHLAND ELECTRICAL UNIT

COMMENTS (Cont'd)

Replaced rotted and leaning poles at four locations on Davenport near Cullum and Craighill. Transferred power and communication circuits to new poles.

Assumed responsibility for electrical maintenance of six wells and the pumphouse in 3000 Area, and also for new lift station on McMurray Road.

Made acceptance inspection for eight fire alarm boxes in M-1 Area and five fire alarm boxes in K-4 Area.

Installed the replacement unit for the defective vehicle actuating device in traffic signal at George Washington Way and Van Giesen and put signal in automatic operation.

Completed installation of rubber gaskets on cubicle doors of substations BB1-S1 and BB1-S2 to prevent dirt and dust from entering equipment.

Installed conduit and wiring in concrete floor at Public Library for charging machines, and telephones on new charging desk.

Replaced sump pump #1 at Sewage Treatment Plant due to a bad bearing and sump pump #2 due to shorted motor

Completed changing of defective parts furnished by G.E. in General Electric traffic controller

All school substations were checked and cleaned, while school system was idle.

Repaired twenty defective Sangamo meters that have accumulated since July 1952. These meters were repaired with parts supplied by the Sangamo Company.

By using hot-line tools switch X205 on Wright Avenue was bonded and grounded to clear up radio interference in that area.

Six residential meter disconnects were made on Thursday, July 30, for non-payment of electrical billings. All customers have payed and are now reconnected.

COMMUNITY OPERATIONS AND REAL ESTATE
PUBLIC WORKS UNIT
July 31, 1953

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees Beginning of Month	13	74
Transfers Out	1	3
Transfers In	--	1
New Employees (Re-activated)	--	1
Terminations	--	--
Total End of Month	12	73

SANITATION

Total weight of waste material collected and disposed of during July was 1341 tons. Collection of garbage and servicing of trash trailers at commercial facilities was placed on a five day per week schedule at the beginning of the month, thus eliminating all Saturday work by the Sanitation group.

ROADS AND STREETS

A drainage problem in the 1500 block of Marshall Avenue was corrected through the installation of a catch basin and 158' of storm sewer tied into the Van Giesen Street storm line, and re-gradin' and stabilizing of the gutter flow line. A similar problem in the 1500 block of Mahan Avenue was corrected by raising the grade of a section of the street and laying new gutter lines.

As usual during the irrigation season, the maintenance of drainage on those streets which have gravel gutters required considerable attention, and every effort was made to correct those locations where a real problem existed.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks was continued.

PARKS AND PUBLIC GROUNDS

A "snap-on" irrigation system was installed in the filled area which was the former site of the Riverside Swimming Pool, and the entire surface of the fill was seeded to lawn grass.

The shore line of Wellisian Lake was mowed and cleaned in preparation for the opening to juvenile fishing on August 9.

Community Operations - Public Works Unit

PARKS AND PUBLIC GROUNDS (Continued)

Routine seasonal maintenance of Parks buildings, equipment and grounds; shelterbelt plantings, public areas, and other lawn areas assigned to this group was continued during July.

DOMESTIC WATER

Average daily consumption for July was 22.09 million gallons. Peak consumption during the month occurred on 7-29-53 when 23.85 million gallons were used. This was an all-time record consumption.

During the first two weeks of July the weather became extremely hot, and water consumption rose to the point that it was not possible to fill the new 5 million gallon reservoir each night. As a result, water pressure in the higher parts of Richland, particularly the south part of the Ranch House area, became quite low during the critical high demand hours of the day. To at least partially alleviate this condition the distribution system was valved so that some of the flow normally going to lower areas was re-routed to the low-pressure sections.

Through raising the pressure during the low consumption hours early Saturday and Sunday, the 5 million gallon reservoir has been partially filled and valved off the system for use during any possible emergency.

The level indicator for the 5 million gallon reservoir has been calibrated and placed in service. The unsatisfactory operation of the 30" altitude valve at this reservoir has not been corrected to date, and discussion of this condition is still in progress between the Atomic Energy Commission and the valve manufacturer.

The contract for equipping of 5 new wells, installation of a well header and two sand traps was awarded to the Cisco Construction Company, and "Notice to Proceed" was given on 7-8-53. This work is now under way and two wells are to be completed within 30 days. The existing well header at the 3000 well field was taken out of service at 9 PM on 7-31-53 to allow the contractor to make tie-ins for wells 3000-J and 3000-L, and the work was completed and the header returned to service at 5 AM, 8-1-53.

Production and consumption records for July are as follows:

	<u>Well Production</u> <u>Million Gallons</u>	<u>Average Daily</u> <u>Production</u>	<u>Total Consumption</u> <u>Million Gallons</u>	<u>Average Daily</u> <u>Consumption</u>
Richland	225.0012	7.2581	556.8394	17.9626
North Richland	289.6360	9.3431	81.3447	2.6240
Columbia Field	169.6160	5.4715		
300 Area			46.6133	1.5037
Total	684.2532	22.0727	684.7974	22.0903

Community Operations - Public Works Unit

SEWERAGE

Approximately 45 thousand gallons of sewage sludge were pumped from the digestors to the drying beds in July.

Number 1 pump at the Sewage Lift Station went out of service early in the month due to a leak in the pump bowl where it was worn through by coarse material and the impeller. The bowl was built up with bronze and was returned to service on 7-31-53.

The lift station on McMurray Road and a section of line from the Bauer Day apartments on Jadwin, were accepted for operation and maintenance on 7-9-53.

Normal operations and maintenance were continued and flow meter readings at the treatment plants for July are as follow:

SEWAGE

	<u>Total Flow</u> <u>Million Gallons</u>	<u>Average Daily Flow</u> <u>Million Gallons</u>
Plant No. 1	37.090	1.196
Plant No. 2	70.572	2.277
Total	107.662	3.473

IRRIGATION SYSTEM

Injection of chlorine into the canal from the penstock east to North Richland has been continued as an aquatic weed control program, and results have been very satisfactory. Weed growth in this section of canal has practically disappeared.

The main canal from the fish screens at Horn Rapids Dam through Richland was treated with commercial aquatic weed killer at the end of July.

Routine operation and maintenance of the canals and irrigation water pressure systems was continued.

RECREATION AND CIVIC AFFAIRS UNIT

MONTHLY REPORT

JULY, 1953

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Beginning of Month	3	2-1/2
New Hires	0	0
Terminations	0	0
Transfers - IN	0	0
- OUT	0	0
	<u>3</u>	<u>2-1/2</u>

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of July 31, 1953:-

Administration	7
Principals & Supervisors	14
Clerical	21
Teachers	0
Health Audiometer	0
Cooks	0
Nursery School & Extended Day Care	0
Bus Drivers	0
Maintenance	21
Operations	<u>37</u>
	100

CLUBS AND ORGANIZATIONS

As of July 31, 1953, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council - Chest	1
Boy Scouts	1
Campfire Girls	1
Hi Spot Club	2
Girl Scouts	2
Justice of the Peace	1
Y.W.C.A.	2
Chamber of Commerce	<u>1</u>
	11

(Recreation and Civic Affairs Unit Monthly Report Continued)

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business and Professional Organizations	23
Churches and Church Organizations	27
Civic Organizations	19
Schools	10
Fraternal Organizations	25
Political Organizations	5
Recreation and Social Clubs - Alumni	3
- Arts, Music, Theater	11
- Bridge	3
- Dance	5
- Garden	3
- Hobby	9
- Social	11
- Sports	19
Veteran and Military Organizations	14
Welfare Groups	7
Youth - Boy Scouts	20
- Girl Scouts	49
- Campfire Girls	36
- Miscellaneous	15
	<u>314</u>

RECREATION

The regular monthly meeting of the Parks and Recreation Board was held on July 1, 1953. The Board was advised that Wellsian Lake would open for fishing in late August or early September. The next regular meeting of the Board is scheduled for August 6, 1953.

On July 4, 1953 the Richland Post 71 of the American Legion sponsored its annual Fourth of July Celebration consisting of Kiddies Parade, Krate Derby and display of Fireworks.

During the month the State Game Commission transplanted 1500 Blue Gill fish in Wellsian Lake, and plans were made to open the Lake for fishing on Sunday, August 9, 1953.

The Unit prepared a brochure on "Richland's Supervised Recreation Program" to serve as a recreation guide for parents and children for available recreation programs and facilities. Available copies will be placed at various public buildings.

The Community House Committee met on July 20, 1953, in order to review a request of the Richland Players, Inc. concerning use of kitchen space at the Community House for all phases of the Club's activities. The Committee favored kitchen use for fine arts purposes, but felt that the space should be booked in a similar fashion to other rooms in the Community House and that no priority for use should be given to any single organization.

(Recreation and Civic Affairs Unit Monthly Report Continued)

Attendance for the month of July, 1953 was as follows:-

COMMUNITY HOUSE -

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Sub-total</u>
I. <u>Sponsored Programs</u>				
Games Room Activities	26	4126	397	4523
II. <u>Special Events</u>	-	-	-	-
III. <u>Permit Groups</u>				
Hi Spot	6	1025	14	1039
Senior Citizens	-	-	-	-
Y Supper Club	3	-	208	208
Gentrics	-	-	-	-
Rec-A-Teers	5	-	1140	1140
IV. <u>Other</u>	<u>8</u>	<u>-</u>	<u>411</u>	<u>411</u>
Sub-Totals	48	5151	2170	7321

PARKS AND PLAYGROUNDS -

RIVERSIDE PARK -

I. <u>Sponsored Programs</u>				
Tumbling	12	191	-	191
Story Hour	8	294	-	294
Band Concerts	1	162	184	346
Wading Pool	31	4328	-	4328
II. <u>Special Events</u>	-	-	-	-
III. <u>Permit Groups</u>				
Richland Softball Assoc.	25	2500	2500	5000
IV. General Recreation Activities	<u>31</u>	<u>11486</u>	<u>7016</u>	<u>18502</u>
Sub-Totals	108	18961	9700	28661

COLUMBIA PLAYFIELD -

I. <u>Sponsored Programs</u>				
Triple O League	20	-	500	500
Play-For-Fun League	26	800	200	1000
II. <u>Special Events</u>	-	-	-	-
III. <u>Permit Groups</u>				
Lake Shore League	4	250	350	600
American Legion League	14	1200	900	2100
IV. General Recreation Activities	<u>31</u>	<u>1885</u>	<u>1695</u>	<u>3580</u>
Sub-Totals	95	4135	3645	7780

(Recreation and Civic Affairs Unit Monthly Report Continued)

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Sub-Total</u>
<u>OTHER</u>				
Wellsian Lake	-	-	-	-
Neighborhood Playgrounds	310	8100	2190	10290
Burlin Camp	6	236	277	513
Softball - Baseball Bookings	152	1482	798	2280
Jefferson Little League	<u>26</u>	<u>5200</u>	<u>4000</u>	<u>9200</u>
Sub-Totals	494	15018	7265	22283

SPADING PROGRAM
(October-April)

SUMMARY OF STATISTICS

	<u>No. of Sessions</u>	<u>Youth</u>	<u>Adults</u>	<u>Total</u>
Community House	48	5151	2170	7321
Parks and Playgrounds	<u>885</u>	<u>38114</u>	<u>20610</u>	<u>58724</u>
Total Attendance-July	933	43265	22780	66045

Grand Total For July	<u>66,045</u>
FY Grand Total-To-Date	<u>66,045</u>

RICHLAND PUBLIC LIBRARY

JULY 1953

ORGANIZATION AND PERSONNEL

	<u>Exempt</u>	<u>Non-Exempt</u>
Employees - Beginning of Month	4	6
Transfers In	0	0
Transfers Out	0	0
New Hires	0	1
Terminations	0	0
End of Month	4	7

GENERAL

Circulation

Books	12,360 (Adult - 6,930; Juvenile - 5,430)
Magazines	292
Pamphlets	47
Records	878
Interlibrary Loan	35
Grand Total	13,612

Current Book Stock

Books added this month	561
Books withdrawn this month	16
Grand Total	26,330

Phonograph Records Added 100

Phonograph Records Withdrawn 5

Registration

Adult	118
Juvenile	71
Total	189

Total Registered Borrowers 13,518

The following changes in the physical arrangement of the library have been completed this month: installation of Hauserman partitions around catalog-order librarian's work space in the northeast corner of the library; fabrication and installation of twenty-four feet of magazine shelving along the north wall of the reading room inside the Hauserman partitions to provide additional storage space for back issues of magazines; installation of fifteen feet of counterheight shelving in the children's room; installation of a nine-section charging desk facing the entrance to the library to release the old charging desk and the space behind it for clerical duties; rearrangement of book stacks in the reading room to form a young people's section. The library was closed the week of July 27 through July 31 for the installation of the new charging desk and the reshelving and rearrangement of books and magazines. The new changes are proving a definite improvement for both the library staff and the public.

Fifteen meetings were held in North Hall this month.

The final number of registrations for the Children's World Flight Summer Reading Club is four hundred and seventy. Of these, one hundred and ninety-seven have made book reports, and fifteen have finished their required reading.

RICHLAND POLICE DEPARTMENT

JULY 1953

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	18	33
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
Total - End of Month	<u>18</u>	<u>33</u>

GENERAL

We received fifty new red and white reflectorized stop signs on July 28, 1953, and these are now being installed at major intersections throughout the community. The new signs meet with standard requirements, and have the quality of being more visible in both daylight and darkness.

Stop signs have been erected throughout the new Bauer-Day housing district continuing Cottonwood and Duportail as arterials throughout this new district.

TRAINING

Advance training for Richland Police members at the small arms range for the period in Field Instruction was as follows:

.38 Caliber Revolver - - $\frac{1}{2}$ Hour

Total number of men reporting at the Range - - - -	27
Total number of men instructed in Field - - - -	27
Number of men fired over the Army-L Course - - - -	27

Qualifications on the Army-L Course are as follows:

Expert - - - - - 7	25.9%
Sharpshooter - - - - - 3	11.1%
Marksman - - - - - 10	37.1%
Unqualified - - - - - 7	25.9%

TRAFFIC

	<u>1953</u>		<u>1952</u>		<u>1953</u>	<u>1952</u>
	June	July	June	July	Total to Date	Total Same Period
Reportable accidents	23	12	19	18	145	168
Property damage accidents	19	12	17	15	126	144
Injury accidents	4	0	2	3	19	23
Total persons injured	5	0	2	4	26	30
Fatal accidents	0	0	0	0	1	1
Accidents-Daylight hours	20	11	12	16	100	106
Darkness	3	1	7	2	45	61
Accidents-Business district	8	5	6	9	56	56
Residential "	9	7	8	6	69	91
Other "	6	0	5	3	20	21
Accidents investigated	16	4	13	13	91	118
Criminal complaints filed	13	4	9	8	74	88
Violations contributing to accidents:						
Negligent driving	2	0	6	0	19	25
Fail. to yield r.o.w.	9	3	6	6	51	49
Following too closely	4	4	1	3	25	20
Drunk driving	2	0	0	0	3	2
Pedestrian violation	0	0	0	0	3	0
Inattention to driving	0	0	1	0	1	8
Reckless driving	0	0	1	0	4	7
Speeding	1	0	1	0	1	1
Unsafe speed	2	1	0	1	8	33
Improper backing	1	0	1	0	10	10
Disregard. stop sign	0	0	2	4	5	7
Hit and run	0	0	0	0	1	1
Improper passing	0	1	0	0	3	4
Improper turn	2	1	0	2	3	4
Failure to signal	0	0	0	0	0	1
Wide right turn	0	0	0	0	0	1
Wrong side of road	0	1	0	1	1	1
Traffic safety meetings	8	9	4	16	53	91
Attendance, traffic films	345	355	165	785	3920	5525
North Richland:						
Reportable accidents	13	7			62	
Property damage	11	5			50	
Injury accidents	2	2			12	

	<u>1953</u>		<u>1953</u>		<u>1952</u>	
	June	July	Ave. Per Accid.	Ave. Per Accid.	June	July
Richland			June	July		
Accident property damage	\$5,065.00	\$2,450.00	\$220.22	\$204.17	\$277.20	\$268.16

ACTIVITIES AND SERVICES

	June		July	
	Richland	No. Richland	Richland	No. Richland
Bank escorts and details	4	4	3	4
Bicycles impounded	5	0	15	2
Bicycle violations, other	2	0	4	0
Bicycles registered	68	0	17	9
Children lost or found	25	2	11	4
Complaints invest. (no enf. action)	33	2	31	1
Deaths reported	0	0	1	0
Dog, cat, loose stock complaints	2	0	12	0
Dogs, cats, reported lost or found	7	0	5	0
Doors, windows found open in facil.	38	52	34	40
Emergency messages delivered	12	92	6	97
Fires investigated	9	7	4	2
Guns registered	16	0	2	0
Law enforcement agencies assisted	5	0	3	0
Letters of inquiry	74	0	75	0
Miscellaneous escorts	13	10	7	2
Persons injured by dogs	2	1	4	0
Plant departments assisted	10	1	18	1
Prisoners processed through Jail	27	11	29	13
Private individuals assisted	33	4	20	0
Property lost or found	25	0	22	0
Records inquiries	85	0	82	0
Reports proc. through Records	295	125	327	102
Street lights out rep. to Elect.	100	40	113	25
<hr/>				
Total	890	351	845	302

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
JULY 1953

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER *		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART I								
1. Murder								
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break. & Entry	2	2	1	1	-	-	-	-
6. Larceny Over \$50.00	4	1	2**	-	-	-	1	-
Under \$50.00	14	5	-	1	2	1	2	-
7. Auto Theft	-	2	-	-	-	2	-	-
TOTAL PART I CASES	20	10	3	2	2	3	3	-
PART II								
8. Other Assaults	-	3	-	-	-	-	-	2
9. Forgery & Counterfeit	1	-	-	-	-	-	-	-
10. Embezzlement & Fraud	-	1	-	-	-	-	-	1
11. Stolen Prop: Buy: Rec.	-	-	-	-	-	-	-	-
12. Weapons: Carry: Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	-	1	-	-	-	-	-	1
15. Offenses Ag. Fam. & Child	-	-	-	-	-	-	-	-
16. Narcotics-Drug Laws	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	11	5	-	-	-	-	11	5
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	1	-	-	-	-	-	1	-
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intox.	4	2	-	-	-	-	4	2
23. Viol. Rd. & Dr. Laws								
Fail. to Stop & Identify	1	1	-	-	-	-	1	1
Speeding	48	9	-	-	-	1	48	8
Stop Sign	18	14	-	-	-	-	18	14
Reckless Driving	3	2	-	-	-	-	3	2
Right of Way	1	-	-	-	-	-	1	-
Negligent Driving	23	6	-	-	-	-	23	6
Defective Equipment	3	1	-	-	1	-	2	1
Illegal Passing	2	-	-	-	-	-	2	-
24. Parking	69	27	-	-	4	7	65	20
25. All Other Traff. Violations	20	14	-	-	4	-	16	14
26. All Other Offenses:								
Malicious Mischief	5	-	-	-	2	-	1	-
Vandalism	10	1	-	-	1**	-	-	-
Disturbance	-	1	-	-	-	1	-	-
Bike Violations	19	-	-	-	19	-	-	-
Dest. of Govt. Prop.	-	1	-	-	-	1	-	-
Investigation	3	2	-	-	3	2	-	-
Family Disturbance	6	1	-	-	6	1	-	-
TOTALS	248	92	-	-	40	13	196	77

Carried forward to page LF-5

OFFENSES	KNOWN Rich. No. Rich.		UNFOUNDED Rich. No. Rich.		CLEARED OTHER * Rich. No. Rich.		CLEARED ARREST Rich. No. Rich.	
Totals brought forward from page LF-4	248	92	-	-	40	13	196	77
26. All other Offenses:								
Public Nuisance	10	-	-	-	-	-	10	-
Prowler	1	1	-	-	1	-	-	-
Neighborhood Trouble	3	-	-	-	3	-	-	-
Illeg. Use of Guns	1	-	-	-	1	-	-	-
Pickup for Outside Agency	1	-	-	-	1	-	-	-
Viol. of Fireworks Ord.	1	-	-	-	1	-	-	-
Juvenile Delinquency	1	-	-	-	-	-	1	-
27. Suspicion	-	-	-	-	-	-	-	-
TOTAL PART II	266	93	-	-	47	13	207	77
PART III								
28. Missing Persons	4	3	-	-	4	3	-	-
Lost Persons	9	2	-	-	9	2	-	-
Lost Animals	3	-	-	-	1	-	-	-
Lost Property	22	3	-	-	12	-	-	-
29. Found Persons	1	-	-	-	1	-	-	-
Found Animals	3	-	-	-	-	-	-	-
Found Property	17	-	-	-	12	-	-	-
TOTAL PART III	59	8	-	-	39	5	-	-
PART IV								
30. Fat.M.V.Tr. Acc.								
31. Pers.Inj.M.V.Tra.Acc.	-	2						
32. Prop.Dam.M.V.Acc.	12	5						
33. Other Traffic Acc.								
34. Public Accident								
35. Home Accidents								
36. Occupational Acc.								
37. Firearms Accidents								
38. Dog Bites	4	-						
39. Suicides								
40. Suicide Attempts								
41. Sud.Death.& Bod. Found	1	-						
42. Sick Cared For								
43. Mental Cases								
TOTAL PART IV	17	7						
COMPOSITE TOTALS								
PART I,II,III,IV CASES	362	118	3	2	88	21	210	77

*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: orders from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column only in that there was no arrest. ** One vandalism cleared for the previous month. ** One grand larceny cleared for the previous month.

Property reported stolen	Richland	\$1,041.76
Property Reported stolen	No. Rich.	\$4,163.95
Property recovered	Richland	\$ 499.00
Property recovered	No. Rich.	\$4,050.00

MONTHLY REPORT			RICHLAND POLICE DEPARTMENT				JUVENILES INVOLVED					JULY 1953		
OFFENSE	NO. CASES	JUVENILES	SEX	10	11	12	13	14	15	16	17			
<u>RICHLAND</u>														
Illegal Shooting	1	3	M			2	1							
Viol. of Fireworks Ord.	1	2	M		1			1						
Investigation	1	1	M	1										
Mischief	1	6	M			1	2	1		2				
Larceny	1	1	F							1				
Prowler	1	3	M					1	1	1				
Juvenile Delinquency	1	1	M								1			
TOTALS	7	17		1	1	3	3	3	1	4	1			
<u>NORTH RICHLAND</u>														
Juvenile Fight	1	2	M		1		1							
Larceny	1	1	M			1								
Family Disturbance	1	1	F								1			
TOTALS	3	4			1	1	1				1			

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore. & Calif.			1952	1953	1953
Six Months (July-Dec. 1952)	One Month Average		July - Dec.	June	July
Murder	.440	.073	-	-	-
Robbery	11.850	1.995	2	-	-
Agg. Assault	10.5	1.75	-	-	-
Burglary	69.95	11.658	8	1	2
Larceny	206.7	34.45	111	24	18
Auto Theft	38.65	6.44	9	3	-

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural districts.

State of Washington			1952	1953	1953
Six Months (July-Dec. 1952)	One Month Average		July - Dec.	June	July
Murder	.228	.038	-	-	-
Robbery	8.28	1.38	2	-	-
Agg. Assault	2.68	.447	-	-	-
Burglary	61.4	10.23	8	1	2
Larceny	199.25	33.208	111	24	18
Auto Theft	35.6	5.933	9	3	-

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average		Richland	Richland	
Percentage of Cases		1952	1953	1953
Year of 1952		July - Dec.	June	July
Robbery	59.0	-	-	-
Burglary	74.1	8%	-	50%
Larceny	57.4	24%	25%	17%
Auto Theft	80.4	8%	100%	-

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower group because of the practice of some jurisdictions not to fingerprint youthful offenders."

**RICHLAND POLICE DEPARTMENT
(COMMUNITY OF NORTH RICHLAND)**

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

Wash.Ore. & Calif. Six Months (July-Dec. 1952)		One Month Average	1952 July - Dec.	1953 June	1953 July
Murder	.176	.029	-	-	-
Robbery	4.74	.790	-	-	-
Agg. Assault	4.20	.700	-	-	-
Burglary	27.98	4.663	2	1	2
Larceny	82.69	13.782	24	8	6
Auto Theft	15.46	2.577	2	4	2

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural districts.

State of Washington Six Months (July-Dec. 1952)		One Month Average	1952 July - Dec.	1953 June	1953 July
Murder	.091	.015	-	-	-
Robbery	3.31	.552	-	-	-
Agg. Assault	1.07	.178	-	-	-
Burglary	24.56	4.093	2	1	2
Larceny	79.70	13.283	24	8	6
Auto Theft	14.24	2.373	2	4	2

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Year of 1952		No. Richland 1952 Oct. - Dec.	No. Richland 1953 June	No. Richland 1953 July
Robbery	59.0	-	-	-
Burglary	74.1	-	-	-
Larceny	57.4	8%	25%	17%
Auto Theft	80.4	33%	50%	-

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation. which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower age group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
JULY 1953

VIOLATION	NO OF CASES		NO OF FORF.		CASES CONT.		CASES DISM.		WARR. ISS.		SENT JAIL		SENT SUSP.		LIC. REV.		ORIG. PREV. MON.		OTHER VIOL.		BAIL FORF.		FINES		FINES SUSP.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
AID & ABET. NEG. DR.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
DEFECTIVE EQUIPMENT	7	5	23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DRIVERS LICENSE	38	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DRUG WHILE LIC. REV.	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DRUNKEN DRIVING	7	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F.T.S. & I.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F.T.Y.R.O.W.	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FOLLOWING TOO CLOSELY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HIT AND RUN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ILLEGAL PARKING	74	20	42	12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ILLEGAL PASSING	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
IMPROPER PLATES	6	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEGLIGENT DRIVING	34	22	7	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO REGISTRATION	12	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
PERMIT UNLIC. OPER. TO OPER. VEH.	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
RECKLESS DRIVING	5	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SPEEDING	54	21	26	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
STOP SIGN	21	6	14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ASSAULT	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
BREAK & ENTER	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
FORGERY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GRAND LARCENY	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
INDECENT LIBERTIES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
INJURY TO PROPERTY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LARCENY BY CHECK	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PETIT LARCENY	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PUBLIC INTOXICATION	14	7	7	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PUBLIC NUISANCE	10	6	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RESISTING OFFICER	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
THIRD DEG. ASSAULT	4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VAGRANCY	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL	317	134	123	48	11	1	1	1	1	1	3	2	2	2	5	36	41	\$1208.50	\$1610.00	\$485.00	30.00	30.00	30.00	30.00	30.00	30.00

ONE DRUNKEN DRIVING CASE AMENDED TO RECKLESS DRIVING.
TWO DRUNKEN DRIVING CASES AMENDED TO NEGLIGENT DRIVING.
ONE GRAND LARCENY CASE AMENDED TO PETIT LARCENY.

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
JULY 1953

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES			BAIL FORF.	FINES	FINES	
										ORIG. MON.	PREV. MON.	OTHER VIOL.			SUSP.	
DEFECTIVE EQUIPMENT	3	1	1	1	1					1	1		\$	\$ 10.00	\$ 10.00	
DRIVERS LICENSE	11	5	1	5							8			12.50	7.50	
DR. WHILE LIC. REV.	2			2												
DRUNKEN DRIVING	3	1	1	1					2	1				75.00		
F.T.S. & I.	1				1											
ILLEGAL PARKING	17	4	8	5						1			28.00	14.00	7.00	
ILL. USE OF 1 WAY ST.	11	4	7										40.00	20.00	5.00	
IMPROPER PLATES	2			2												
LOANED DR. LIC. TO UNLIC. OPER.	1	1					1									
NEGLIGENT DRIVING	10	3	3	2	2					5			65.00	90.00		
NO REGISTRATION	3			3							3					
RECKLESS DRIVING	4	1		2	1				1	1			25.00			
SPEEDING	9	5	4							2			32.50	37.00		
STOP SIGN	17	2	7	7	1					2	1		30.00	10.00		
AUTO THEFT	1			1												
GAMBLING	1	1												25.00		
PUBLIC INTOXICATION	4	3	1										12.50	57.50	22.50	
THIRD DEG. ASSAULT	2	1	1										35.00	25.00		
TOTAL	102	32	33	31	6		1		3	13	14		\$243.00	\$401.00	\$52.00	

TWO DRUNKEN DRIVING CASES AMENDED TO NEGLIGENT DRIVING.
ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.
ONE SECOND DEGREE ASSAULT CASE AMENDED TO GAMBLING.

POLICE DIVISION - TRAFFIC CONTROL STATISTICS
JULY 53

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatuities		Major Injuries		Minor Injuries	
	June	July	June	July	June	July	June	July
Richland	23	12	0	0	1	0	3	0
North. Richland	13	7	0	0	0	0	2	2

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Cases	
	June	July	June	July	June	July	June	July
Richland	2	5	9	2	2	0	10	5
North. Richland	1	2	1	0	11	1	10	4

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	June	July	June	July	June	July	June	July	June	July	June	July	June	July
Richland	1	0	0	0	7	4	0	1	2	1	0	4	10	10
North Richland	1	1	0	0	21	7	0	0	1	0	0	0	23	8

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way V.		Neg. Drvg.		Parking V.		Other V.		Totals	
	June	July	June	July	June	July	June	July	June	July	June	July	June	July	June	July	June	July
Richland	29	50	14	20	14	5	4	3	0	3	24	26	33	73	37	63	155	243
N. Richland	12	7	14	15	2	2	3	3	0	0	2	5	35	16	8	33	79	81

TRAFFIC VOLUME: Average 24-Hour Traffic Volume Count for week ending July 25, 1953, Stevens North of Lee - 6,571 cars.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY.

COMMUNITY OPERATIONS

RICHLAND FIRE DEPARTMENT

JULY 1953

<u>Organization and Personnel</u>		<u>Exempt</u>	<u>Non-Exempt</u>
Employees - Beginning of Month		67	10
Transfers In		0	0
Transfers Out		4	0
New Hires		3	0
End of Month		66	0
<u>Fire Protection</u>		<u>Richland</u>	<u>North Richland</u>
Fire Loss (Estimated):	Government	\$ 13.50	\$ 0.00
	Personal	0.00	0.00
	July Total	13.50	0.00
	1953 Total	\$184,040.32	\$2,677.15
Response To Fire Alarms		19	21
Investigation of Minor Fires & Incidents		5	0
Ambulance Responses		30	
Inside Schools or Drills		26	10
Outside Drills		18	11
Safety Meetings		8	3
Security Meetings		4	1
Fire Alarm Boxes Tested		184	100

Two mutual-aid fire responses were made in July, one on July 3rd when a truck assisted the Kennewick Rural Fire Department at the Richland Y and the other on July 8th when a truck was sent to assist the Benton City Volunteer Fire Department.

A Boy Scout was examined at the Central Fire Station on July 16th for Firemanship Merit Badge.

Ten pre-school nursery children, accompanied by an adult, were conducted on a tour of the Central Fire Station on July 17th.

Semi-annual pressure-testing 7,300 feet of 2½ inch and 2,250 feet of 1½ inch fire hose was completed in July.

Fire Prevention

During July, 199 Richland and 46 North Richland fire inspections were made, resulting in 45 hazard reports. Two hundred eighty fire extinguishers were inspected, 53 installed, 76 removed, 38 recharged, 10 relocated and 4 repaired.

Emergency repairs were requested for a fire door in the North Richland 101 Building

RICHLAND FIRE DEPARTMENT

JULY 1953

Following a report of horseplay with fire extinguishers in the 1131 Bus Dispatcher's Office and the discovery of two empty ones, Transportation supervision agreed to issue a Bulletin relative to authorized use of fire extinguishers.

In an effort to assist school authorities locate trouble that necessitated disconnecting the Chief Joseph School alarm system from the city system, plans of the original installation were reviewed with School Maintenance supervisor. State inspection of school pressure vessels was also discussed.

A joint inspection was made with Commercial Real Estate supervision of hazardous conditions prevailing at Campbell's No. 3 Market and the Pennywise Drug basement.

The Assistant Fire Marshal addressed 48 Public Works employees on July 15th on the subject of fire prevention.

Special investigation was made of hazardous storage in unexcavated sections of the Desert Inn basement.

Alterations to the 703 and 744 Buildings were inspected.

Hazardous trash conditions in the Uptown commercial district, the result of overflowing trash wagons, was discussed with Commercial Real Estate.

Initial discussions were held on Fire Prevention Week during the July 28th Chamber of Commerce meeting.

The Fire Marshal, Community Engineer and School Maintenance Supervisor met to discuss installation of two hutment classrooms at Columbia High School and permanent Propane tanks to replace temporary cylinders at the Chief Joseph Junior High School.

COMMUNITY OPERATIONS AND REAL ESTATE DEPARTMENT
ENGINEERING UNIT

JULY - 1953

<u>PERSONNEL</u>	<u>Exempt</u>	<u>Non-Exempt*</u>	<u>Total</u>
Employees - Beginning of Month	6	3	9
Employees - End of Month	6	3	9

* One Employee on permanent loan

ENGINEERING UNIT JOBS COMPLETED DURING MONTH OF JULY

Project L-821 - Fencing Electrical Yard - Cancelled 7-6-53.
Project K-749 - Installation of Radio Equipment, North Richland Fire Station.
Project S-760 - Knight Street Sanitary Sewer.
ESR 630-M - Correction of Master Plan
ESR 674-RC - Uptown Parking Lot Study
ESR 676-M - Sidewalks, Aprons, Drives in the Vicinity of Swimming Pool & Bathhouse
ESR 759-RC - "As Built", Richland Investment Company
ESR 794-RC - Legal Description, Plot rear of Kennell-Ellis Building
ESR 798-RC - Legal Description, Plot south of Tri-City Herald Building
ESR 799-RC - Legal Description, Plot of land known as the Binyon Building
ESR 800-RC - Legal Description, Plot Northeast corner Duportail & Hartford
ESR 801-RC - Legal Description, Plot Adjacent to By's Burgers and Standard Station
ESR 807-M - Preliminary Engineering, Walks, Grading, Planting, Hospital Grounds. - This
Esr closed into Project 25.7.
ESR 810-RC - Extend water service, Site rear of Kennell-Ellis
ESR 813-RC - Legal Description, Coordinates of Plot, Richland Heights Baptist Church
ESR 814-RC - Legal Description, Henry Webber Site
ESR 823-RC - Legal Description, EH Kidwell Site, across street from By's Burgers
ESR 824-PW - Design & Estimate, Water Metering -
ESR 825-M - Community Fireplace at Columbia Playfield. This ESR closed into project K-825.
ESR 830-M - Design, Plans, & Specifications, McMurray Street Improvement
ESR 831-RC - Tap Water Main, Block 2, Uptown Business District
ESR 834-RC - Sewer Line Study, Paul R. Lewis Site, North of By's Burgers
ESR 835-RC - Map for Area North of Symons
ESR 838-RC - Extend water service - Grace Bacon Site.

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED

PROJECTS:

C-488 - Additional Erosion Control and Development, Public Areas, F.Y. 1952 - Work started on Jason Lee Playground. Shelterbelt complete.
K-753 - Flow Control Valve, Sewage Treatment Wet Well - Awaiting delivery of equipment.
K-756 - Installation Traffic Light, Symons & George Washington Way - Equipment on order.
K-825 - Community Fireplace at Columbia Playfield - Equipment & materials on order.
L-728 - Installation of Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Department.
S-808 - Replacement 10" Water Main, 700 Area - Plans & specifications sent to AEC for review.

ENGINEERING UNIT

ENGINEERING SERVICE REQUESTS

- 571-M - Free Methodist Church - 99% complete. No progress this month.
- 572-M - First Baptist Church - 79% complete. Progressing slowly.
- 574-M - Assembly of God Church - 62% complete. Progressing slowly.
- 581-RC - "As Built" Plans for LDS Church - Plans received and are being checked.
- 588-RC - Alteration Permits - An open active file.
- 612-RC - "As Built" Plans for Richland Thrifty Drug - Plans received and are being checked.
- 628-M - Prepare "As Built" Plans for Richland Fire Alarm System - Given to Engineering Department for completion with other work.
- 634-M - Engineer Liaison, Richland Water Expansion - Following construction closely by making inspections periodically.
- 663-M - Plan Checking, Richland Development Co., Block 5, North Commercial Area - 99% complete. Final inspection to be made.
- 686-RC - Utility lines, Vacant Commercial Sites - An open active file.
- 706-RC - Plans, Specifications & Inspections, Medical Dental Properties, Inc. - 99% complete. Final inspection to be made.
- 715-M - Television Antennae - An open active file.
- 722-M - Erosion Control & Development of Public Areas, F.Y. 1953 - Project being prepared for submission.
- 726-M - Plans, Specifications & Inspections, CD Joseph Bldg. #4, Richland Realty Company - 99% complete. Final inspection to be made.
- 729-M - Plans, Specifications & Inspections, Grace Bacon Bldg. - 10% complete. Construction progressing slowly.
- 730-M - Plans, Specifications, & Inspections, Richland Realty Co., Symons & Jadwin - 20% complete. Construction progressing. Installing beams & purlins.
- 755-M - Preparatory Engineering, Tie-in Richland & North Richland Fire Alarm Systems - Given to Engineering Department for completion with other work.
- 765-RC - "As Builts" All Saints Episcopal Church - Plans received. Deferred for other work.
- 767-M - Plans, Specifications & Inspections, Joseph-Cannon Bldg., Lee & George Washington Way - 99% complete. Final inspection to be made.
- 768-M - Plans, Specifications & Inspections, Carl Peterson Bldg. Lee & Gillespie - 99% complete. Construction exceptions to be cleared by letting contract.
- 770-M - Latter Day Saints Storehouse, West Jadwin Avenue - 55% complete. Progressing slowly.

ENGINEERING UNIT

- 775-RC - Legal Description, Randolph Insurance - 75% complete.
- 779-M - Plans, Specifications, & Inspections, Richland Labor Temple - W 50% complete. Work progressing.
- 783-M - Plans, Specifications, & Inspections, American Legion Building - 90% complete.
- 785-RC - "As Built" Plans for McVicker Bldg. #4 - Plans received. Deferred for other work
- 790-M - "As Builts" General - Work progressing steadily, rate of progress depending on availability of personnel.
- 796-RC - Legal Description, Plot east of Washington State Liquor Store - 90% complete.
- 802-RC - Legal Description, Veterinary Hospital Site - 90% complete.
- 803-M - Profile grade, 300 Block on Craighill - 75% complete.
- 804-RC - Study, Roof Richland Lutheran Church Building - Given to Engineering Department for study and report. They report it will be completed in a week.
- 805-RC - Plans, Specifications, & Inspections, Cannon-Joseph Bldg. West of Kennell-Ellis - 15% complete. Progressing slowly.
- 806-RC - Plans, Specifications, & Inspections, Richland Development Co., Block 2, Uptown Business District - 70% complete. Building Permit issued.
- 809-RC - Plans, Specifications, & Inspections, Parcell Bldg. Duportail & Hartford - Plans received for review. Not certain if plans submitted are to be used.
- 811-RC - Extend water & sewer - Site Duportail and Hartford - Design deferred for other work
- 815-RC - Plans, Specifications, & Inspections, Veterinary Hospital - Plans not submitted.
- 816-RC - Plans, Specifications, & Inspections, Richland Transfer & Storage - Plans not submitted.
- 817-RC - Plans, Specifications, & Inspections, Diana Langevin Bldg. - Plans checked. Lessee proceeding without permit.
- 818-RC - Plans, Specifications, & Inspections, McVicker Bldg. - Plans not received.
- 819-RC - Plans, Specifications, & Inspections, Safeway Store - Plans received, and returned to architect with comments.
- 820-M - Landscape design for 300 Area - Preliminary Planning in progress.
- 822-RC - Plans, Specifications, & Inspections, EH Kidwell Bldg. Plans not received.
- 826-M - Drainage, Marshall Avenue & Van Giesen Street Intersection - 90% complete.
- 827-RC - Plans, Specifications, & Inspections, Paul R. Lewis Bldg. - Plans not received.
- 828-RC - Plans, Specifications, & Inspections, Paul R. Lewis Bldg. #2 - Plans not received.

ENGINEERING UNIT

- 829-M - Design, Plans, & Specifications, Storm Drain, Geo. Wash. Way - 80% complete.
- 832-M - Inspection & Liaison, Spokane Housing, Inc. - Work continuing.
- 833-M - Inspection & Liaison, Bauer-Day, Inc. - Work Continuing.
- 836-RC - Plans, Specifications, & Inspections, Church of Nazarene Addition - Work progressing. 20% complete.
- 837-CA - Cost Estimate, Replace water tank, Recreation Hall Building - Deferred for other work.
- 839-RC - Legal Description, Metal Hutment Warehouses 1125-3 and 1125-4 - Work not started.

REPORT OF THE

4002 1163

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>
Real Estate Section				
350	2	1	2	1
Housing & Maintenance Unit				
351	5	18	5	18
353	12	139	12	154
Commercial Property Unit				
357	<u>6</u>	<u>6</u>	<u>6</u>	<u>6</u>
	25	154	25	179

Increase in number of employees 15

GENERAL

A ground lease was entered into with Highland Development Agency, Inc. covering the construction and operation of a two-story low rent building in section 2, Union Square District.

At the request of several interested parties, bids were invited for the installation and operation of a second community television system in Highland.

Five new leases of privately-owned commercial buildings opened for business.

Part of three Government-owned buildings in the Union Square area was transferred to the Real Estate Section for commercial leasing.

HOUSING & MAINTENANCE UNIT

July, 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

Beginning of month:	17 exempt	
	<u>157</u> nonexempt	
	174	174
End of month:	17 exempt	
	<u>172</u> nonexempt	
	189	189

The increase in personnel is due to the filling of open requisitions in the painting craft.

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING JULY 31, 1953

HOUSES OCCUPIED BY FAMILY GROUPS

	Conven tional	A&J	T	Pre cut	Ranch	Pre fab	Dorm Apt	A&J Apt	2BR Apts	Fourth Housing	Tract	Total
G.E. Employees	2212	256	9	375	811	1173	10	51	62	196	36	5191
Commercial Facilities	106	14	1	35	82	53		5	4	9	2	311
Community Activities	9			1	7	4					1	22
Medical Facility	4	19			3	1				3		30
Post Office	6				2	12				1	3	24
AEC	83	27		24	63	16		5	3	16	3	240
Other Government	6	2			4	2					1	15
Schools	52			6	10	55		1	1	2		127
Charles T. Main	2			3	5	9				2		21
Kaiser Engineer	6	8			6							20
J.A. Jones	2	2		1	2	1						8
Vitro Corporation	1	3			1			1				6
P.S. Lord	1				2					1		4
Minor Contractors					1	3						4
Vernita Orchards											5	5
Atkinson Jones		1			1							2
Blaw-Knox		1		1								2
Commonwealth Inc.						1						1
Total	2490	333	10	446	1000	1330	10	63	70	230	51	6033
Houses assigned leases written	3					1						4
Houses assigned leases not written	7			4		10		1				22
Available for assignment												
	2500	333	10	450	1000	1341	10	64	70	230	51	6059

	<u>Begin Month</u>	<u>Moved In</u>	<u>Moved Out</u>	<u>End of Month</u>	<u>Differ</u>
Conventional Type	2490	38	38	2490	—
A&J Houses	333	3	3	333	—
"T" Type Houses	10	1	1	10	—
Precut Houses	447	7	8	446	-1
Ranch Type Houses	994	14	8	1000	+6
Prefab Houses	1337	30	37	1330	-7
Dorm Apartments	10	-	-	10	—
A&J Apartments	62	4	3	63	+1
2 BR Apartments	68	4	2	70	+2
Fourth Housing	229	3	2	230	+1
Tract Houses	51	1	1	51	—
Total	6031	105	103	6033	+2

July 1953

DORMITORY REPORT

Dormitories:

	<u>Beds Available</u>	<u>Vacant Beds</u>	<u>Occupied Beds</u>
Men	616	30	586
Women	<u>481</u>	<u>110**</u>	<u>371*</u>
Total	1097	140**	957*

* This includes 2 beds used for Dorm Office
 ** Includes 27 beds in Dorm M 13(Teachers)

Waiting Lists

	<u>Single Rooms</u>	<u>Double Rooms</u>
Men	39	0
Women	52	0

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	31
R. O. F.	4
Discharge	0
Transfers	4
Retirement-divorce-misc.	6
Move off project	15
Deaths	2
Wherry housing	1
Total	61

ALLOCATIONS

Houses allocated to new tenants	65
Exchanged houses	14
Moves	19
Turnovers	3
Total leases signed	101
Total cancellations	97
Houses assigned "As Is"	52
Houses sent to renovation	25
Applications pending	528

TENANT RELATIONS PROGRESS REPORT

	Orders Incomplete as of June 30	Orders Issued 6-30 to 7-31	Total Orders Incomplete as of July 31, 1953
Service orders	279	1340	198
Work orders	873	360	670
Service charges		235	

Principal work order loads

	Incomplete as of June 30, 1953	Incomplete as of July 31, 1953
Laundry tub replacement	0	3
Bathroom renovations (tub, tile, lino.)	31	34
Tileboard - bathroom	0	2
Kitchen floor linoleum	137	104
Kitchen cabinet linoleum	82	81
Shower stall	6	11

96 alteration permits were issued, as compared to 96 permits issued during June.

Install air conditioner	31	Basement excavation	4
Install fence	11	Install driveway	2
Install oil burner	8	Install outside faucet	1
Remove cabinets in kitchen	1	Install additional wiring	1
Install automatic washer	11	Remove broom closet	1
Install automatic dishwasher	4	Install 110V circuit	1
Install automatic dryer	3	Install TV antenna	1
Sand & refinish floors	1	Reverse range and refer	1
Construct patio	4	Install back door	2
Install water softener	2	Install summer switch	1
Install fireplace	5		

1313 inspections were made, as compared to 784 made in June.

Alteration permits	60	Sidewalks	51
Bathtubs	18	Sinks	30
Drainage	8	Tileboard	12
Floor boards	9	Toilet seats	46
House siding	3	Topsoil	18
Jack & shim	2	Walls	3
Leaking basements	14	Dorms	124
Linoleum	16	Windows	7
Paint	7	Renovations	158
Porch & steps	72	Cancellations	142
Screens	9	Shows (new tenants)	115
Shades	3	Miscellaneous	367
Shower stalls	19		

REAL ESTATE MAINTENANCE PROGRESS REPORT

JULY, 1953

WORK SUMMARY

JOB TYPE	ISSUE DATE	BACKLOG	JOBS COMPLETE	COMP. TO DATE F. Y. 1954
BATHTUBS	3-24-53	8	15	34
KITCHEN FLOOR TILE	2-11-53	72	20	51
BATHROOM TILE	4-6-53	1	0	0
KITCHEN SINK TOP	4-3-53	55	26	53
PREFAB FLOOR LINOLEUM	None			
SHOWER STALLS	5-29-53	13	2	2
LAUNDRY TUBS	5-27-53	3	2	3
MAJOR SEWER REPAIRS	5-18-53	2	12	26
REPLACE OIL TANKS	None			
ROOF COATING	11-12-52	5	0	0
RANCH HOUSE HOT WATER LINE	None			
REMOVE TREES	3-5-53	33	5	13
RENOVATION	7-17-53	4	14	32
WATER HEATERS	None		5	10
REBUILD PORCHES	3-10-53	71	3	6
ASPHALT SERVICE WALKS	None	0	3	19
ASPHALT STEPS	4-15-53	6	0	3

MONTHLY PROGRESS REPORT
EXTERIOR PAINTING PROGRAM
FISCAL YEAR - 1954

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	68			68
B	220			220
C	0			
D	0			
E	21			21
F	45			45
G	0			
H	57			57
K	0			
L	4			4
M	0			
Q	0			
R	0			
S	0			
T	20			20
U	0			
V	0			
Y	950	376	376	574
Z	50	9	9	41
1 BR.	0			
2 BR.	0			
3 BR.	0			
TRACT	0			
1 BR. Apt	40	20	40	0
2 BR. Apt	0			
TOTAL	1475	405	425	1050

Exterior Painting Precuts 100% complete
 Exterior Painting 7 Tract Houses 100% complete

Summary of Interior Painting Program to Date

Completed this month: 4
 Completed to date:

PLUMBING SHOP

<u>JOB DESCRIPTION</u>	<u>NUMBER COMPLETED</u>
Replacements - Major Fixtures	
Bathtubs	44
Laundry Tubs	1
Electric Water Heaters	14
Shower Stalls	3
Routine Plumbing Repairs	19
Plumbing for floor tile replacements	36
Cleared major sewer stoppages caused by tree roots	28
Steam work Orders	17
Steam Inspection once a week on Dormitories and Government-Owned Commercial Buildings	
Install Electric Hot Water Tanks at Recreation Hall	3
Install Septic Tank Drain Field J-685	

SERVICE ORDER CREW
(11 Employees)

The following is a status report on Service Orders:

A. On hand at the beginning of the Month	92
B. Received during the Month	1340
C. Completed during the Month	1343
D. On hand at the end of the Month	95
E. A total of 389 man-hours were spent on work orders.	

RENOVATION & LABOR CREW

<u>JOB DESCRIPTION</u>	<u>NUMBER COMPLETED</u>
Housing Units Renovated	29
Performed miscellaneous work including assisting the Plumbing Shop in sewer repairs. Also routine work in repairing side walks, removing trees, repairing steps, repairing compound, picking up drain oil from service stations, etc.	

LINOLEUM CARPENTRY CREW
(27 Employees)

<u>JOB DESCRIPTION</u>	<u>NUMBER COMPLETED</u>
Replace bath wall tile	38
Repair bath wall tile	4
Replace bath floor tile	45
Repair bath floor tile	2
Replace bath wall board	2
Replace kitchen floor linoleum	65
Repair kitchen floor linoleum	11
Replace kitchen sink top linoleum	41
Repair kitchen sink top linoleum	28
Replace work bench linoleum	7
Repair work bench linoleum	1
Replace kitchen sink	2
Repair bedroom linoleum	1
Repair utility room linoleum	1
Replace floor linoleum - Thrifty Drug Store	2
Repair floor boards	4
Install Metal strips	2
Repair windows - Shop	32
Replace sash balances	8
Drill Weepholes	11
Repair Roof	1
Apply roof coating	26
Repair porches	11
Repair siding	9
Repair wall	1
Raise Slab	4
Jack & Shim	19
Repair door - Elite Shop	1
Repair Door - Style Center	1
Repair Exterior Main Doors - Shop	6
Replace Metal Threshold	3
Repair Laundry trays	4

Linoleum Carpentry Crew - continued

<u>JOB DESCRIPTION</u>	<u>NUMBER COMPLETED</u>
Repair Faucet	1
Reset Clothes Line	1
Replace Trellis	1
Set Parking Lot Posts - Campbell's #2 Store	1
Install Guard Rail - Desert Inn	1
Make Picture Frame - 703 Building	1
Make Cabinets - 1116 Building	1
Repair Ladders - Electrical Distribution	1
Repair for Painters	70.8 M.H.
Repair Fire Damage	2
Repair window screens - Shop	31
Chempoint - Routine	58
Chempoint - Work Orders	69

CARPENTER SHOP

Time spent on Mock-up work	282.0 M.H.
Time spent on Office Equipment, etc.	22.0 M.H.
Time spent on Shop Equipment	38.8 M.H.
Time spent repairing Dormitory Furniture	2.0 M.H.
Repair Cabinets	5
Cabinet Doors Repaired - Shop	4
Cabinet Doors Replaced - New from Shop	15
Cabinet Drawers Repaired - Shop	4
Paint Touch-ups completed	96
Paint Work Orders completed in Shop	24
Exterior Carpentry Repair for Paint - Ranch Houses	158
(Exterior Carpentry Repair Progress)	
Ranch House Screen Doors Repaired	111
(Exterior Carpentry Repair Progress)	
Ranch House Screen Doors Replaced - New	3
(Exterior Carpentry Repair Progress)	
Precut Screen Doors Repaired	7

MECHANICAL SHOP
(6 Employees)

A. Millwright Crew: (4 Employees)

JOB DESCRIPTION

Number Completed

Furnace Service Orders
Routine Furnace Inspections

29
605

GENERAL:

The Ranch type houses (Y & Z) fan motors and blowers have been lubricated. Filter pads have been replaced as necessary.

B. Sheetmetal Crew: (2 employees)

JOB DESCRIPTION

Number Completed

Replacement of Shower Stalls
Replacement of Gutters
Flashing Ranch House Coal Hatches
Fabricate Faucet Plates

12
21
17
250

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION
July 1953

PERSONNEL - COMMERCIAL PROPERTY UNIT:

	<u>July</u>
Beginning of Month	12
End of Month	12
Net Change	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>	
	<u>North</u>		<u>North</u>		<u>North</u>	
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>
June	1,527	193	121	1	1,648	194
July	<u>1,573</u>	<u>189</u>	<u>121</u>	<u>1</u>	<u>1,694</u>	<u>190</u>
Net Change	/46	-4	0	0	/46	-4

SUMMARY OF ROUTINE ITEMS PROCESSED:

	<u>Commercial</u>		<u>Noncommercial</u>		<u>Total</u>		
	<u>North</u>		<u>North</u>		<u>North</u>		
	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Richland</u>	<u>Total</u>
Work Orders	<u>34</u>	<u>31</u>	<u>0</u>	<u>0</u>	<u>34</u>	<u>31</u>	<u>65</u>
Back Charges	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
FY Work Order Total	<u>589</u>	<u>292</u>	<u>56</u>	<u>0</u>	<u>645</u>	<u>292</u>	<u>937</u>
FY Back Charge Total	<u>45</u>	<u>0</u>	<u>15</u>	<u>0</u>	<u>60</u>	<u>0</u>	<u>60</u>

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Lease:

Richland Development Company, Inc. - a ground lease covering the construction and operation of a two-story commercial building in Block 2, Uptown Business District.

2. Supplemental Agreements:

- a. Standard Oil Company of California - to provide for the construction of building addition, approximately 25' x 5' to the existing Standard Service Station at 1323 Lee Boulevard.

- b. Campbell Food Market #2 - to restate and redefine all of the rights and duties of the Lessor and Lessee and to supersede the basic agreement dated May 24, 1944, as assigned and as amended.
 - c. Parker A. Hanson - to provide for lease of additional land and adjustment of rental payments.
 - d. Richland Dental Center - to provide for lease of additional space in the Medical-Dental Building and adjustment of rental payments.
3. Invitation for Bids:
- Bid assemblies were mailed to interested parties for the installation and operation of a community television system in Richland, Washington. The bid opening date is set for 2:00 P.M., September 24, 1953.

GENERAL:

A. Commercial:

- 1. Independent Order of Foresters opened an office in Automatic Laundry Company Building, Block 5, Uptown Business District.
- 2. Richland Credit Bureau opened for business in the Spencer-Kirkpatrick Building, Uptown Business District.
- 3. Pasco Tri-City Storage opened for business in the Spencer-Kirkpatrick Building, Uptown Business District.
- 4. L & S Texaco Service Station commenced business operations in the Carl E. Peterson Building, Light Industrial Area.
- 5. Linn Motors commenced business operations in the Carl E. Peterson Building, Light Industrial Area.
- 6. Diana Langevin started construction of an investment building on the plot of land located between Mickey's Shoe Renewing and Tri-City Herald.
- 7. Three Government-owned buildings, 1125-2, 1125-3, 1125-4, were transferred to the Real Estate Section to be offered for lease.

B. Noncommercial:

- 1. Four pasture permits were issued.
- 2. Church of the Nazarene started construction of a building addition.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of commercial enterprises:

Richland

Golf course
Coin operated food machines

North Richland

Trailer accessories, parts & service
Coin operated food machines

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

A. COMMERCIAL

JUNE

	<u>North</u>		<u>Total</u>
	Richland	Richland	
1. Number of Government-owned Buildings	36	8	44
a. Number of Prime Lessee Businesses	39	9	48
b. Number of Sublessee Businesses	18	0	18
c. Total Businesses in Government-owned Buildings	57	9	66
2. Doctors and Dentists in Private Practice	27	0	27
3. Number of Privately-owned Buildings	50	7	57
a. Number of Prime Lessee Businesses	39	6	45
b. Number of Businesses operated by Sublessees	76	2	78
c. Total Businesses in Privately-owned Buildings	115	8	123
4. Privately-owned Buildings under Construction	11	0	11
5. Total Number of Businesses in Operation	172	17	189

B. NONCOMMERCIAL

1. Government-owned Buildings

- a. Churches
- b. Clubs and Organizations
- c. Government Agencies

	4
	8
Total	15

2. Privately-owned Buildings

- a. Completed and in Use
- b. Under Construction

	10	1
	6	1
Total	16	2

3. Pasture Land Permits

95

JULY

	<u>North</u>		<u>Total</u>
	Richland	Richland	
1. Number of Government-owned Buildings	39	8	47
a. Number of Prime Lessee Businesses	39	9	48
b. Number of Sublessee Businesses	18	0	18
c. Total Businesses in Government-owned Buildings	57	9	66
2. Doctors and Dentists in Private Practice	27	0	27
3. Number of Privately-owned Buildings	50	7	57
a. Number of Prime Lessee Businesses	39	6	45
b. Number of Businesses operated by Sublessees	81	2	83
c. Total Businesses in Privately-owned Buildings	120	8	128
4. Privately-owned Buildings under Construction	12	0	12
5. Total Number of Businesses in Operation	177	17	194

23

END

**DATE
FILMED**

6 / 26 / 92