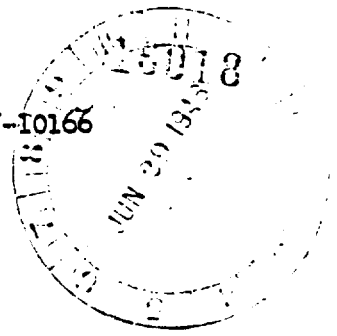
REPOSITORY PNL
COLLECTION Atmospheric Releases
BOX No. N/A
FOLDER N/A

DECLASSIFIED

727821

HW-10166-DEL



R HW-10166

#1 - H. A. Winne, Schenectady
#2 - Zay Jeffries, Pittsfield
#3 - C. G. Suits, Schenectady
#4 - R. C. Muir
#5 - C. N. Gross
#6 - A. B. Greninger
#7 - F. R. Creedon
#8 - Office of Hanford Directed Operations
Attention: C. Shugg, Manager
#9 - Office of Hanford Directed Operations
Attention: C. Shugg, Manager
#10 - Office of Hanford Directed Operations
Attention: C. Shugg, Manager
#11 - Office of Hanford Directed Operations
Attention: C. Shugg, Manager
#12 - Office of Hanford Directed Operations
Attention: C. Shugg, Manager
#13 - 700 File
#14 - 700 File
#15 - 700 File

June 21, 1948

CLASSIFICATION REVISED FOR DECLASSIFICATION LEFT UNCHANGED
By
Date
U.S. AEC Division of Classification

HANFORD WORKS

MONTHLY REPORT

MAY, 1948

Classification Cancelled And Changed To DECLASSIFIED WITH DELETIONS
By Authority of DOE OMER, 6-6-91, RLO-CG-4
By TL BRUSTER, 8-6-91
Verified By [illegible] 8-12-91

This document contains restricted data within the meaning of the Atomic Energy Act [illegible] Law No. 585). Its transmission or the revelation of its contents in any manner, not authorized by [illegible] prohibited by law.

This Document Consists of
263 Pages. No. 8 of
15 Copies.

1223477

THIS DOCUMENT HAS BEEN SCANNED AND IS STORED ON THE OPTICAL DISK DRIVE

DECLASSIFIED

TABLE OF CONTENTS

	Starting Page
General Summary	3
Staff	5
Force Report	6
Personnel Distribution	7
Plant Statistics	13
Manufacturing Division	15
P Division	16
S Division	29
Power Division	36
Maintenance Division	42
Project Engineering Division	46
Electrical Division	61
Instrument Division	77
Transportation Division	83
Technical Divisions	89
Service Divisions	120
Employee and Community Relations Division	122
Purchasing and Stores Division	132
Labor Relations and Wage Rate Division	135
Plant Security and Services Division	136
Community Divisions	162
Community Administration	165
Community Commercial Facilities Division	169
Community Housing Division	173
North Richland Realty Division	176
Community Activities Division	181
Community Fire Division	187
Community Patrol Division	192
Public Works Division	203
Health Instrument Division	212
Medical Division	232
Accounting Division	242
Project and Related Personnel	262

1223478

DECLASSIFIED

[redacted]

GENERAL SUMMARY
MAY 1948

The first instance of rupture of a uranium slug since the start of Hanford operations occurred in the 100-F pile on May 30. Some details of this incident are given in this month's report by the "P" Division, and further information will appear in the June report. The possibility of such an occurrence had been anticipated and methods of dealing with it had been developed. However, the slug was so thoroughly jammed in the process tube that extreme measures and considerable time were required to dislodge it. It was broken open in the process of removal, resulting in considerable contamination of the discharge basin.

Reactivation of 100-B Area continues with a substantial part of the work of restoring equipment to service completed.

Initial tests of a new scheme for segmental charging were made. The device looks very promising since the manipulation of active slugs is all handled from the front face of the pile where conditions are safer for operating personnel. It also reduces complication at the rear face where possibilities of jamming an active slug in a more complicated mechanism must be avoided.

Construction of facilities for removing contaminated particles in the 200 Area stack gas lines was started. It appears that there is no easy way of solving this problem and, in view of its critical nature, it was decided efforts should be concentrated on a "brute force" solution, that of treating the entire gas stream just before it enters the stack.

The stack gas disposal problem is being attacked at an accelerated pace by all of the divisions involved. The new dissolver off-gas scrubbers have proved quite successful in reducing contamination from this source and it now appears that the dissolver operation contributes less than 2% to the total filterable activity discharged through the stacks. There has also been some decrease in filterable activity with the reduced air flow through active cells which has been accomplished through partially sealing the cell cover blocks. Further work will be needed to establish the improvement which is to be obtained in this manner. Preliminary tests on filters for the 224 Building vent lines have given poor results and attention has been shifted to scrubbers as a means for cleaning up this source of air contaminatio

A major discovery was made during the month in the evaluation of the mechanism of dimensional change in uranium resulting from pile exposure. The C_o spacing evidently expands at the rate of at least 0.6% per 100 MD/ton. A meeting of metallurgists and physicists from all AEC sites will be held in Richland, June 16, to discuss these developments.

It was discovered that rolled uranium slugs which have not been heated into the beta phase shrink longitudinally and expand radially during irradiation. This demonstration of the preferential expansion of uranium crystals in one dimension has established the basic cause of slug blistering. However, the phenomenon also makes rolled, lead-dipped slugs unsuited for high exposures in the pile.

1223479

[redacted]

DECLASSIFIED

[redacted]

General Summary

The pile test finding that alpha rolled uranium slugs canned by the lead-dip process warp severely, expand in diameter and contract in length during irradiation resulted in the decision that the triple-dip canning process should be used with this metal. It is believed that the greater dimensional stability displayed by alpha rolled, triple-dipped slugs results from the structural transformation which attends heating into the beta phase during the bronze dip. The optimum conditions for this critical dip are under intensive investigation.

In line with action taken by the General Manager and his staff, all resources of the Community organization were mobilized on May 28, 1948, for the handling of the flood emergency. An emergency organization was formed and definite responsibilities assigned to all divisions. Daily meetings were held during the balance of the month for review of flood reports and determination of necessary action. Emergency housing of displaced persons and those cut off from outside the project was arranged. Trailer space at North Richland was made available to families evacuated from the flooded areas between Kennewick and the "Y".

Construction of a dike from the Transient Quarters (Desert Inn), north along Hains Avenue, was started on May 28, 1948, and built up to an elevation of 360 feet.

Necessary traffic regulations were placed in effect to facilitate the emergency construction activity and to keep traffic out of flooded areas. These areas were closed except to workers and authorized personnel. All loose equipment was removed from Richland Park and the Labor Yard areas and these areas were evacuated prior to the flood. Electrical equipment, hot water heaters and personal effects were removed from all residences behind the dike as a precautionary measure and also from other buildings subject to flood damage.

Necessary measures were taken to protect the sewage disposal facilities and constant patrol of sewer and water lines was maintained. Emergency plans were prepared for rerouting of traffic, spotting of fire protection equipment, maintenance of bus service, and other measures necessary to maintain communications in the event of dike break. Information on high water conditions was relayed to facility operators and necessary steps taken to assure continued supply of food, milk, and gasoline. Periodic reports on water levels and forecasts were relayed to all divisions.

Manufacturing operations have not been affected by the high flood stage of the Columbia and Yakima Rivers except for the 115 KV substation at Hanford which required considerable protection, and the Transportation Labor Yard at Richland, which consists of old buildings of temporary type construction and which was evacuated. Transportation, Power, Maintenance, and Electrical Divisions were able to give considerable assistance in flood control problems at Richland by looking after minor but essential details while the Construction Division handled the major job of building a dike.

There were two major injuries during the month, which brought the total for the year to four.

DECLASSIFIED

HW-10166

[redacted]

STAFF

General Manager	R. C. Muir
Assistant General Manager	R. S. Neblett
Assistant to the General Manager (Technical and Educational Matters)	W. I. Patnode
Assistant to the General Manager (Budgets and Expense Control)	J. R. Rue
Assistant to the General Manager and Manager of Service Divisions	G. G. Lail
Department Comptroller	F. E. Baker
Counsel	L. F. Huck
Community Manager	E. L. Richmond
Manager, Design and Construction Divisions	F. R. Creedon
Manager, Manufacturing Divisions	C. N. Gross
Manager, Technical Division	A. B. Greninger
Manager, Health Instrument Division	H. M. Parker
Manager, Medical Division	W. D. Norwood, M.D.

DECLASSIFIED

[redacted]

FORCE REPORT
MAY 1948

	Non-Exempt		Exempt		Total	
	4-30-48	5-28-48	4-30-48	5-28-48	4-30-48	5-28-48
GENERAL	7	7	15	6	22	13
DESIGN & CONST. DIV.'S						
Administrative	-	34	-	6	-	40
Construction	313	358	299	264	612	622
Design	222	216	124	142	346	358
Procurement	-	42	-	59	-	101
MANUFACTORING DIVISIONS						
Administrative	-	-	-	3	-	3
"P" Division	252	248	55	55	307	303
"S" Division	253	245	58	57	311	302
Power	402	400	85	85	487	485
Maintenance	634	629	78	79	712	708
Project Engineering	70	70	50	50	120	120
Electrical	225	223	41	40	266	263
Instrument	153	152	44	44	197	196
Transportation	669	683	61	62	730	745
TECHNICAL DIVISION	388	391	215	205	603	596
MEDICAL DIVISION	381	402	81	84	462	486
H. I. DIVISION	192	191	76	82	268	273
ACCOUNTING DIVISION	496	239	59	35	555	274
SERVICE DIVISIONS	1801	-	270	-	2071	-
Employee & Comm. Rel.	-	74	-	20	-	94
Labor Rel.& Wage Rates	-	4	-	4	-	8
Plant Sec. & Service	-	935	-	115	-	1050
Purchasing & Stores	-	169	-	21	-	190
COMMUNITY DIVISIONS	-	385	-	144	-	1029
TOTAL	6458	6597	1611	1662	8069	8259

1223482

1223483

PERSONNEL DISTRIBUTION - MAY 1948

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
GENERAL										
Clerical	---	---	---	---	---	--	---	---	6	6
Total	---	---	---	---	---	--	---	---	7	7
	---	---	---	---	---	--	---	---	13	13
DESIGN & CONSTRUCTION DIVISIONS										
ADMINISTRATIVE										
Supervisors	---	---	---	---	---	--	---	---	6	6
Clerical	---	---	---	---	---	--	---	---	34	34
Others	---	---	---	---	---	--	---	---	---	---
Total	---	---	---	---	---	--	---	---	40	40
CONSTRUCTION										
Supervisors	---	---	---	---	---	--	---	264	---	264
Clerical	---	---	---	---	---	--	---	287	---	287
Others	---	---	---	---	---	--	---	71	---	71
Total	---	---	---	---	---	--	---	622	---	622
DESIGN										
Supervisors	---	---	---	---	---	--	---	---	142	142
Clerical	---	---	---	---	---	--	---	---	127	127
Others	---	---	---	---	---	--	---	---	89	89
Total	---	---	---	---	---	--	---	---	358	358
PROCUREMENT										
Supervisors	---	---	---	---	---	--	---	---	12	12
Clerical	---	---	---	---	---	--	---	---	47	47
Others	---	---	---	---	---	--	---	---	42	42
Total	---	---	---	---	---	--	---	---	101	101

HW-10166

1223484

MANUFACTURING DIVISIONS	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
ADMINISTRATIVE	---	---	---	---	---	---	---	---	3	3
"P" DIVISION										
Supervisors	2	13	16	---	---	16	---	---	8	55
Operators	10	41	38	---	---	147	---	---	---	236
Clerical	---	2	2	---	---	5	---	---	3	12
Total	12	56	56	---	---	168	---	---	11	303
"S" DIVISION										
Supervisors	---	---	---	19	26	---	---	---	11	56
Operators	---	---	---	101	127	---	---	---	2	230
Clerical	---	---	---	4	9	---	---	---	3	16
Total	---	---	---	124	162	---	---	---	16	302
POWER										
Supervisors	9	22	21	6	10	2	4	4	7	85
Operators	50	94	93	24	35	8	---	12	47	363
Clerical	1	2	2	---	1	---	2	---	1	9
Others	5	5	5	3	4	4	---	---	2	28
Total	65	123	121	33	50	14	6	16	57	485
MAINTENANCE										
Supervisors	2	7	8	5	15	7	12	---	17	73
Engineers	---	---	1	2	1	3	1	---	4	12
Mechanics	19	23	71	45	93	62	84	---	109	506
Clerical	1	1	2	1	4	1	2	---	10	22
Others	2	1	10	8	18	12	30	---	14	95
Total	24	32	92	61	131	85	129	---	154	708

HW-10166

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
MANUFACTURING DIVISIONS										
PROJECT ENGINEERING										
Supervisors	---	---	---	---	1	---	---	---	14	15
Engineers	---	---	---	---	5	1	---	---	29	35
Drafting Personnel	---	---	1	---	6	3	---	---	36	46
Clerical	---	---	1	---	1	---	---	---	8	10
Others	---	---	1	---	2	---	---	---	11	14
Total	---	---	3	---	15	4	---	---	98	120
ELECTRICAL										
Supervisors	1	2	3	2	3	2	18	---	6	37
Electricians	10	10	14	11	11	11	58	---	32	157
Clerical	---	---	1	1	1	1	3	---	2	9
Others	1	1	2	1	5	4	34	---	14	66
Total	12	13	20	15	18	18	113	---	54	269
INSTRUMENT										
Supervisors	1	3	5	2	4	15	---	---	14	44
Engineers	---	---	---	1	---	2	---	---	---	3
Mechanics	6	14	14	12	16	33	---	---	5	99
Clerical	---	1	2	1	2	3	---	---	5	14
Others	1	2	4	2	4	14	---	---	9	36
Total	8	20	25	18	25	67	---	---	33	196
TRANSPORTATION										
Supervisors	7	2	2	2	4	1	6	---	38	62
Drivers(Based on Areas Served)	14	22	29	27	47	32	26	---	58	255
Mechanics	11	2	1	---	3	---	1	---	77	95
Trainmen	4	4	4	4	4	---	---	---	8	28
Laborers	6	11	11	3	25	5	---	---	60	121
Clerical	---	1	1	1	---	1	1	---	27	32
Others	14	12	10	7	23	3	7	---	76	152
Total	56	54	58	44	106	42	41	---	344	745

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
TECHNICAL DIVISION										
Supervisors	---	6	---	6	12	29	---	---	8	61
Chemists-Engineers-Physicists & Jr. Technologists & Metallurgist	---	10	13	9	9	129	---	---	12	182
Laboratorians & Analysts	2	12	33	34	54	102	---	---	---	237
Clerical	---	1	---	1	10	26	---	---	15	53
Others	---	2	4	5	3	49	---	---	---	63
Total	2	31	50	55	88	335	---	---	35	596
SERVICE DIVISIONS										
EMPLOYEE & COMMUNITY RELATIONS										
Supervisors	---	---	---	---	---	---	---	---	20	20
Clerical	---	---	---	---	---	---	---	---	65	65
Others	---	---	---	---	---	---	---	---	9	9
Total	---	---	---	---	---	---	---	---	94	94
LABOR RELATIONS & WAGE RATES										
Supervisors	---	---	---	---	---	---	---	---	4	4
Clerical	---	---	---	---	---	---	---	---	4	4
Total	---	---	---	---	---	---	---	---	8	8
PLANT SECURITY & SERVICE										
Supervisors	13	7	9	10	8	13	23	---	32	115
Telephone & Teletype Operators	---	---	---	---	---	---	---	---	50	50
Inspectors	5	4	4	4	4	1	2	2	1	27
Patrolman	47	73	65	70	102	84	41	---	47	529
Firemen	38	---	---	---	---	12	3	---	25	78
Janitor	2	5	5	8	11	13	---	---	42	86
Laundry Operators	---	---	---	---	2	---	---	---	3	5
Clerical	---	---	---	---	---	---	24	---	63	87
Others	---	3	---	3	15	2	3	---	47	73
Total	105	92	83	95	142	125	96	2	310	1,050

1223481

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
SERVICE DIVISIONS										
PURCHASING & STORES										
Supervisors	---	---	---	---	---	---	---	---	21	21
Clerical	---	1	---	1	---	---	---	---	167	169
Others	---	---	---	---	---	---	---	---	---	---
Total	---	1	---	1	---	---	---	---	188	190
COMMUNITY DIVISIONS										
Supervisors	---	---	---	---	---	---	---	51	93	144
Patrolmen	---	---	---	---	---	---	---	83	34	117
Firemen	---	---	---	---	---	---	---	41	55	96
Others	---	---	---	---	---	---	---	286	386	672
Total	---	---	---	---	---	---	---	461	568	1,029
MEDICAL DIVISION										
Physicians	---	---	---	---	---	---	10	8	16	34
Dentists	---	---	---	---	---	---	---	---	11	11
Technicians	---	---	---	---	1	---	---	9	25	36
Clerical	---	---	1	---	---	---	---	30	81	115
Others	1	---	---	2	---	1	---	26	229	287
Total	3	7	---	4	3	2	16	73	362	486
	4	7	1	6	4	3	26			
H. I. DIVISION										
Supervisors	---	1	3	3	9	14	---	---	6	36
Engineers	1	5	7	17	11	7	---	---	---	48
H. I. Inspectors	---	3	7	11	12	15	12	---	---	60
Clerical	---	---	---	---	1	2	---	---	4	7
Others	---	11	7	17	45	30	6	---	6	122
Total	1	20	24	48	78	68	18	---	16	273

HW-10016

1223488

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
ACCOUNTING DIVISION										
Supervisors	---	---	---	---	---	---	---	---	35	35
Clerks	---	---	---	---	---	---	---	---	239	239
Others	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	274	274
GRAND TOTAL	289	449	533	500	819	929	429	1,174	3,137	8,259

23

DECLASSIFIED
WITH DELETIONS

DECLASSIFIED
WITH DELETIONS

DECLASSIFIED
WITH DELETIONS

DECLASSIFIED
WITH DELETIONS

MANUFACTURING DIVISIONS

SUMMARY REPORT FOR MAY 1948

The first instance of rupture of a uranium slug since the start of Hanford operations occurred in the 100-F pile on May 30th. Some details of this incident are given in this month's report by the "P" Division, and further information will appear in the June report. The possibility of such an occurrence had been anticipated and methods of dealing with it had been developed. However, the slug was so thoroughly jammed in the process tube that extreme measures and considerable time were required to dislodge it. It was broken open in the process of removal, resulting in considerable contamination of the discharge basin.

Reactivation of 100-B Area continues with a substantial part of the work of restoring equipment to service completed.

Initial tests of a new scheme for segmental charging were made. The device looks very promising since the manipulation of active slugs is all handled from the front face of the pile where conditions are safer for operating personnel. It also reduces complication at the rear face where possibilities of jamming an active slug in a more complicated mechanism must be avoided.

Construction of facilities for removing contaminated particles in the 200 Area stack gas lines was started. It appears that there is no easy way of solving this problem, and, in view of its critical nature, it was decided efforts should be concentrated on a "brute force" solution, that of treating the entire gas stream just before it enters the stack.

Manufacturing operations have not been affected by the high flood stage of the Columbia and Yakima Rivers except for the 115 KV substation at Hanford which required considerable protection and the Transportation Labor Yard at Richland, which consists of old buildings of temporary type construction and which was evacuated. Transportation, Power, Maintenance, and Electrical Divisions were able to give considerable assistance in flood control problems at Richland by looking after minor but essential details while the Construction Division handled the major job of building a dike.

P DIVISION

MAY - 1948

I. GENERAL

The D and F Piles operated at 275 M.W. throughout May except for the outages listed under Area Activities of this report. The B-Pile was maintained in standby condition with a water flow of 10,120 g.p.m. The 100 Area discharge rate continued at 60 tons per month.

The first suspected instance of slug rupture in an operating pile occurred on May 30, 1948 in Tube 1165-F. The metal had only been in the pile since May 19, 1948. All pile effluent water was held in the 107 Building retention basin.

The 300 Area canning production amounted to 88 tons. This quantity was lower than the nominally scheduled amount (100 tons) because of a shortage of Q cleared personnel and a change in the canning method on May 17, 1948 which reduces the production rate. This change involved the discontinuance of the lead dip process and a reconversion to the triple dip process and was necessary because it was found that alpha-rolled slugs canned under the former process have a marked tendency to warp and expand laterally during pile exposure, being inferior to the triple-dip slugs in these respects.

The canning yield was 91.0%. This represents an increase of 7.4% over April and was the result of a considerable decrease in the number of "non-seat" rejects.

The 300 Area Melt Plant was placed on a 3-shift, 7-day week schedule on May 10. Beginning May 17, all P Division personnel in the 300 Area were placed on a 6-day a week work schedule.

A number of jobs incident to the contemplated start-up of B Area are in progress.

II. ORGANIZATION AND PERSONNEL

Number of Employees on Payroll - May

Beginning of Month:	308
End of Month:	302
Net Decrease:	6

Six operators terminated voluntarily from the 300 Area.

P Division

One chief operator was transferred from 100-F Area to the 300 Area, and two experienced 300 Area operators were transferred to the 100 Areas in preparation for the 100-B Area start up.

Several transfers of supervisory personnel were made, as follows:

W. W. Windsheimer, Assistant Chief Supervisor, from 100-D to 100-B on May 3 to prepare the latter area for start up.

A. A. Janos, Area Supervisor, from 100-D to head up the Process Control group on May 17.

J. A. Haaga, Senior Supervisor, from 700 Area to 100-D, as day relief supervisor, on May 10.

J. H. M. Miller, Shift Supervisor, from 700 Area to 100-D on May 24 to follow construction of Pile DR.

S. L. Nelson, Senior Supervisor, from 300 Area to 100-F for training on May 10.

D. L. DeNeal, Shift Supervisor, from 300 Area to 100-F for training on May 3.

C. G. Lewis, Shift Supervisor, from 100-F to Design and Construction liaison work on May 24.

III. AREA ACTIVITIES

PILE SUMMARY	PILE B	PILE D	PILE F
Time Operated (%)	-	74.3	77.9
Operating Efficiency (%)	-	73.3	73.9
*Power Level (M.W.)	0	275	275
*Inlet Water Temperature (°C)	11.3	12.1	11.8
*Outlet Water Temperature (Maximum °C., 10 tubes, .240" Zone)	11.5	54.3	54.3
Number of Scrams	0	3	4
Number of Purges	0	1	1
Helium Consumption (cu. ft.)	28,820	**91,747	**92,470
Metal Discharged (tons)	0	26.7	36.78
Inhours Gained (this month)	0	0	12
*Inhours Poisoned	-	358	295
*Inhours in Rods	-	***63	70

*Month end figures.

**High losses attributed to purging required following neoprene seal replacement work.

***25 inhours attributed to presence of carbon dioxide in gas circulating system.

P Division

PILE BUILDING

Outage Breakdown:

Date of Outage	Scheduled Metal Discharged	Scheduled Maintenance	Unscheduled	Length of Outage (Hours)
5-1-48		F		4.8
5-1-48	F Area shutdown to discharge temporary poison			3.1
5-4-48	D			19.8
*5-10-48	D	D		128.7
5-12-48	F			26.6
5-15-48	D Area shutdown to discharge temporary poison			4.9
5-19-48	F			46.7
5-21-48	F Area shutdown to discharge temporary poison			2.5
**5-22-48			D	0.2
**5-22-48			F	0.5
5-25-48	D			19.7
**5-26-48			D	0.1
**5-26-48			D	0.3
5-26-48	F			22.1
**5-26-48			F	5.1
**5-27-48			D	16.2
5-27-48	F Area shutdown to discharge temporary poison			2.9
**5-27-48			F	9.5
5-27-48	F Area shutdown to discharge temporary poison			2.4
**5-30-48			F	37.5

*Extended outage for cork seal removal on far side of unit.

**Unscheduled outages for following reasons:

Date	Area	Reason
5-22	D	Power surge caused by crane striking 13.8 KVA line in DR Area.
5-22	F	Faulty controller, #4 Beckman.
5-26	D	Power surge caused by electrical storm.
	D	" " " " " "
5-26	F	" " " " " "
5-27	D	Critical "Y" power condition; impossible to restart unit because of transient poison.
5-27	F	Critical "Y" power condition; electrical outage.
5-30	F	Unit shut down because of high water pressure on Tube No. 1165-F.

Operating Experience

A number of special request samples were processed during May; details of their irradiation may be found in the Technical Section of this report.

Production Tests having operational significance during the month are reported below:

P Division

105-1-P (Effect of Pile Operation on Properties of Graphite)
Tubes 3478-D and 1582-D were discharged on May 10 and 25 respectively. These tubes had operated as gas filled tubes (without cooling water) to evaluate effects of various atmospheres on graphite at ambient pile temperatures. Discharge was effected without difficulty.

105-103-P (Corrosion Rates at Elevated Temperatures)
The orifices of ten selected tubes in D pile were changed from 0.240" to 0.200" to develop higher than normal water temperatures.

105-119-P (Effect of Fabrication Temperature on Blistering)
As a result of experience with material under this test reported in April (HW-9922-A) and some difficulty in discharging Tube 1979-D on May 15, Tubes 1968-D and 1973-D also were discharged on May 15. These latter two tubes had not reached normal concentration and were discharged without difficulty. This completes the discharge of all material charged under this test.

105-121-P (Dependence of Reactivity on Power Level)
A reduced power start-up was performed at F pile following the shutdown of May 12. The unit was started up 26.6 hours after shutdown and operated at 125 M.W. for 13 hours. The level was then raised to nominal 275 M.W. No difficulties were experienced in making the test and the predicted reactivity values compared favorably with actual results.

105-168-P (Replacement of Pile Helium Atmosphere with Carbon Dioxide)
The percentage of carbon dioxide in the gas circulating system was maintained at 25% (nominal) throughout the month, except during the extended outage of May 10, 1948.

105-175-P (Pile Heat Liberation During Shutdown)
The first three parts of the test were conducted at F pile during the month. Conditions and results are tabulated below:

Date	Time After Shutdown Flow Reduced	Water Rate Reduced to	Length of Time at Reduced Flow	Maximum Packing Temp.Rise	Approx. Max.Exit Water Temp.Rise	Max.Bulk Water Temp. Rise
5-12-48	2 hours	5000 gpm	12 hours	0°C	5°C	3.1°C
5-19-48	2 hours	3500 gpm	*10 hours	0°C	7°C	4.7°C
5-26-48	3 hours	2000 gpm	15 hours	0°C	7°C	4.6°C

* Test discontinued to raise water pressure for removal of pieces downstream of stuck slug in Tube 0865.

105-80-P (Irradiation of Beta Slug - Supplement A)
The sodium and uranium beta slug charged in Tube 1481-F

on April 29 (See Doc. No. HW-9922-A) was discharged without difficulty on May 12. A second beta type slug was charged into this tube on May 26, 1948.

105-200-P (Special Irradiations - One Year Samples)
On May 25, Tube 1769-D was charged with several special irradiation pieces; it will be discharged after approximately one year. One of the pieces charged had been previously irradiated. The charging of this piece was effected without incident by the use of special equipment.

Six additional bismuth columns were charged at F Area making a total of 30. The D-Area loading remained constant at 30 tubes.

The filter capacity tests at 183-D and 183-F buildings were discontinued on May 29. High iron content of the inlet water, occasioned by flood stage water flow, forced return of additional filters to the system to maintain specifications on process water.

As reported above, the F pile was shut down on May 30 because of high pressure on Tube 1165-F. This effect was accompanied by a high effluent water activity reading on header 11½. Monitoring of the rear nozzle of the tube after shutdown gave results which could be attributable to fission product contamination that would result from slug rupture. At month end, investigation of the situation and removal of the charge is in progress.

Mechanical Experience

All vertical safety rods are in satisfactory operating condition at month end with the following exceptions:

#25-D - showed evidence of binding on May 27; presently tied out of service for repairs.
#25-F(Failed to operate when unit scrammed on May 26; presently
#35-F(tied out of service for repairs.

Considerable work was done on the vertical safety rods during May. Important jobs are summarized below:

At D pile rods #14, 22, 25, and 26 were rotated in the guides to eliminate binding and clutches were adjusted on rods #13, 16, 23, 25, and 29.

A F pile rods #14, 20, and 27 were oiled to reduce dragging.

Following the discovery of a deposit of fine iron dust in several of the vertical safety rod thimbles at F pile, complete investigation revealed that eleven rods would not enter the unit completely. Measurements at D pile indicated the presence of sufficient material in the thimbles to allow less than 1" vertical clearance on all but six rods. A program of dust removal has begun at F pile. Using an industrial type vacuum cleaner, fitted

with a filter box and cyclone separator, the material has been satisfactorily removed from thimbles Nos. 13, 14, 20, 30, and 37.

All horizontal safety rods are in satisfactory operating condition at month end. Major work done during the month included:

Replacement of the burned-out, low-speed electric motor on A rod in D pile...Satisfactory welding of a pin-hole water leak in No. 7 rod at 100-B Area.

The far side rear vertical neoprene seal was replaced at D Area during the May 10 outage. At the same time, the cork was removed from the expansion joint between the discharge area and the far side of the unit. This latter job is in line with the program to relieve strain on the unit shields discussed in the April report. An offset crack in the wall where the cork was removed provides sufficient shielding and eliminates the necessity for special work similar to that done on top of the units.

As a part of the program discussed above, the brick on top and on the far side of the B pile was removed during the month. Due to the absence of cork on the far side, it was necessary to remove a considerable amount of brick to leave a two-inch space next to the unit. The portion of neoprene seal that extended through this wall was replaced while the brick was out.

Approximately six percent of the work has been completed on the installation of the new 105-107 effluent sewer at F Area. The emergency alternator and electrical lines and poles have been relocated and excavation is now in progress.

F Area experienced two cases of stuck slugs during the month. These are summarized below:

On May 20, Tube 0865-F could not be moved with the automatic charger after the sixth piece had been discharged. Forces up to 6,000 ~~p.s.i.~~ pounds were applied with the specialized equipment with no further charge movement. The pieces downstream of the stuck slug were washed out, the stuck piece back-seated, the ribs cut out of the tube downstream of the stuck slug, and the remainder of the charge pushed out without difficulty. During the discharge of this tube, the rear gun-barrel bellows was ruptured. Temporary repairs were effected by the installation of a rubber boot. The front Van Stone flange also was broken during the course of this work.

On May 30, when the unit was shut down because of high pressure (see discussion under Operating Experience), attempts to discharge Tube 1165-F with pressures up to 6000 ~~p.s.i.~~ pound. were unsuccessful. Work of fabricating equipment for removal of metal on each side of the stuck piece is in progress at month end.

1223497

P Division

Pile Development

The program of algae removal at the 107 basins by chlorine treatment continued during the month. On May 21, microscopic examinations indicated that the calcium hypochlorite treatments at 100-D Area have been effective in killing the algae and other organisms, and the algae mat has peeled from the walls in several spots. The program will be continued.

On May 4, a trial run of a hot slug counter, designed to record individual slugs as discharged, was made at 100-D. The test indicated the need for further development work. The counter is being studied as a part of the segmented discharge program. Newly designed segmented discharge equipment, which involves the use of a reel and metal retrieving tape, was tested at the B pile during May. The trial was conducted under simulated operating conditions and the results appeared encouraging, although some design modifications are required.

The installation of slack cable limit switches has been completed on two of the vertical safety rods at B pile. The assembly was thoroughly tested during the month and appears very satisfactory.

GAS PROCESSING BUILDING

During the removal of the stuck slug from Tube 0865-F, the front Van Stone flange was broken allowing water to enter the gas circulating system. This water was removed from the inlet gas duct sump and the system was dried from 0.1% to 0.038% moisture in sixteen hours by the operation of two dryers.

SPECIAL HAZARDS

The lead brick shielding on the discharge area side of the openings cut in the wall across the top of the units has been augmented by the installation of a 1" thick steel plate at D pile. This arrangement has eliminated radiation readings from this source.

Excavation for the effluent sewer at 105-F has exposed the present sewer line and revealed additional water leakage. The area surrounding the excavation has been set up as a danger zone and a burial trench has been dug for disposal of the contaminated earth.

All possibly contaminated water resulting from the incident in Tube 1165-F is being held in the retention basin 107-F for analysis. As soon as the water flow to this tube was shut off, the remaining uncontaminated low flow through the pile was diverted to the river.

The removal of rust accumulation from the vertical rod thimbles resulted in high readings on the separator used with the vacuum cleaner. The separator was shielded with lead and, when work was finished, the entire separator assembly and its contents were buried.

P Division

300 AREA - METAL FABRICATION

Production Statistics

Production for the month of May was as follows:

Billets Produced	61 Tons
Rods Machined	150 Tons
Acceptable Pieces Canned	*88 Tons

*Includes approximately 34 tons of triple dipped material.

Melt Plant

The casting yields were as follows:

	% Yield		
	April	May	To Date 1948
Billet	73.7	75.5	72.6
Solid Metal	89.1	92.8	89.3

Operation was on a three-shift, five-day week schedule until May 10 when it was placed on a three-shift, seven-day week schedule. Because of the continued shortage of graphite crucibles and molds only solid scrap was melted during the month.

On May 3, the 16" high-vacuum valve to the north H-16 diffusion pump failed to operate. The valve was disassembled and it was found that material from the furnace room floor had worked down around the stem into the sleeve and burred the threads. After the defective parts were machined the valve was returned to service. A rubber boot was placed around the top of both the north and south valves to prevent reoccurrence.

Difficulty was encountered with crucibles cracking during the melting cycle. Three failed on May 5, 7, and 10, respectively, in the A furnace and one on May 18 in the B furnace. No coils were damaged, but it was necessary to replace all brick work underneath the coils. The crucible failures appeared to have resulted from the filler having been burned to the extent that the strength of the graphite was reduced appreciably. Crucibles that appear to be burned on inspection are now removed from service, even though they are not cracked.

The Stokes finishing pump failed on May 5. Inspection revealed that the valve spring and plate were broken. The parts were replaced and the pump returned to service on May 6, 1948.

The magnetic contactor in the starter switch on the "A" motor generator set burned out on May 15. One of the lead wires to the switch was found to be defective and apparently caused the difficulty. The contactor was replaced temporarily with three small units on May 17. They have functioned satisfactorily to date and will be replaced as soon as a standard unit is received.

P Division

The installation of the ¼-ton electric hoist and monorail in the billet sawing room was completed on May 22. This installation provides a safer means of handling billets through the sawing and weighing operations.

A 5-ton crane was installed in the furnace room. This work, which was begun on May 17, necessitated suspending furnace operations on the day shift May 17 to May 20, inclusive, and partially through May 25 to complete the welding of monorails to the ceiling. Electrical connections remain to be completed.

On May 18 it was noted that an abnormal amount of oil was collecting in the drip leg of the exhaust line from the Stokes pump. Several backfires occurred during this period, presumably due to oil vapor locks in the exhaust line. The north Stokes pump was overhauled on May 24 with an appreciable reduction in the amount of oil collecting in the drip leg. It is planned to install stainless steel flash screens at the exhaust flange of each pump and further investigation will be made.

Annealing and Machining

Machining yields were as follows:

% Yield (4" A's)		
April	May	To Date 1948
66.5	67.1	66.7

No improvement has been shown on machining yields. The yield on rods rolled to a finished diameter of 1 7/16" at Lockport was 66.1%. Although these rods were slightly reduced in diameter (1/16"), an increase at the same time in solid scrap more than compensated for the reduction in turnings. A number of cuts were made at random on rods to determine the minimum depth of cut necessary to obtain complete cleanup. They ranged from a minimum of 0.016" to a maximum of 0.124" (near rod end). As the result of both poor surface quality and irregularity of rod diameters, it does not appear that further reduction in rod diameter would be practical at present.

Three carloads of alpha rolled rods weighing a total of 111 tons were received on May 2. A total of 79 tons was rolled at Lockport and 32 tons at Joslyn. On May 29 two carloads, totalling approximately 105 tons, were received from Joslyn; these represent the first rods fabricated from billets produced at the Hanford Works.

Seventy-five B billets were gamma extruded on May 6 in conformance with Production Test No. 314-55-M, "Duplexing Uranium". The billets were divided into four groups; the first, third, and fourth group contained nineteen billets each and the second contained eighteen. The four groups were extruded through dies having land diameters of 1.613", 1.675", 1.738", and 1.800", respectively. The resultant average rod diameters were 1.564", 1.627", 1.688", and 1.750", nominally, respectively. The rods were shipped to Lockport on May 14 to be rolled to a finished diameter of 1 7/16". After rolling they will be returned for processing.

P Division

Production lots 586, 587, and 588, which were reported as under-annealed and held following canning last month, were found to have the desired grain characteristics after canning. The finished pieces were released for normal handling.

Chip Recovery and Oxide Burning

The Chip Recovery yield was as follows:

% Yield		
April	May	To Date 1948
88.9	90.1	89.7

Chip Recovery operated 30 eight-hour shifts and processed 90,414 pounds of briquettes in Mav. The processing of a backlog of turnings was completed on May 22, and Chip Recovery is now being operated only as necessary to process current material.

The material burned in the oxide burner was as follows:

Weight Out - Lbs.		
April	May	To Date 1948
6473.	9973	38057

The oxide burner was operated daily. Replacements for the exhaust ducts are now being fabricated and will be installed next month.

Canning Operation

The canning yield was as follows:

% Yield (4")		
April	May	To Date 1948
83.6	91.0	87.8

Canning rejects, by cause, were:

	% Total Canned (4")		
	April	May	To Date 1948
Non-Seating	9.5	3.4	4.8
Marred Surface	1.0	1.5	1.3
AlSi on Outside of Can	2.0	1.4	1.4
Frost Test	1.6	.9	1.5
Bad Welds	1.3	1.3	1.3
Miscellaneous	1.0	.5	1.9
	16.4	9.0	12.2

1223501

DECLASSIFIED
WITH DELETIONS

The lead dip process for canning was discontinued and a complete reconversion was made to the triple dip process on May 17.

Canning yields for the month showed a general marked improvement over last month, except for the first week after converting to the triple dip process. The lower yields at that time can be attributed chiefly to the unfamiliarity of a number of operators with the process.

The thermocouple lead wires to seven furnaces have been replaced with chromel-alumel wire. This work is being done as each furnace is shut down for routine overhaul and will be completed next month.

The use of hydrofluorosilicic acid as a cap etchant was discontinued on May 10. Phosphoric acid was substituted as per revised operating process, Document HW-9401, "Process for Canning Uranium Four-Inch Slugs".

Considerable work has been done since converting to the triple dip process in an attempt to determine the optimum dipping time and/or temperature of the bronze to gain the desired grain size and orientation in alpha rolled material. Slugs have been dipped in the bronze for periods ranging from and temperatures ranging from To date no definite conclusions have been reached.

A total of 5297 acceptable "commercial grade" aluminum cans were used in conformance with Production Test No. 313-102-M, "Evaluation of Four-Inch Commercial-Tolerance Cans". The overall quality of the canned pieces compared favorably with those canned using regular process cans. Therefore, the canned pieces have been released for normal handling.

Three pieces of Special Request No. 40 (Plutonium) were canned. In addition, a total of 1545 poisons slugs and 2403 lead slugs were canned during the month.

	% Recovered		Average Wt.-Lbs.	
	May	To Date 1948	May	To Date 1948
Z Slugs	63.3	71.9	3.898	3.907
X Slugs	28.1	19.9	3.854	3.853
Rejects	8.6	8.2	--	--
	100.0	100.0		

Recovery was operated on a two-shift schedule in May. A total of 48 tons of gamma extruded triple dip 8" canned pieces and 19.4 tons of 4" canned gamma extruded lead dipped pieces remain to be recovered and converted to solid scrap for remelting.

Inspection and Testing

Autoclave rejects were as follows:

DECLASSIFIED
WITH DELETIONS

1223502

P Division

	April	May	To Date 1948
	0.51/M	0.18/M	0.42/M

A large improvement was shown in autoclave failures this month with only nine occurring as compared to 24 in April. The chief causes for failures were pin holes and insufficient bonding of the cap.

The "As Received" quality of cans, caps, and sleeves inspected during the month was as follows:

	% Useable (4")		
	April	May	To Date 1948
Aluminum Cans	83.7	94.2	89.2
Aluminum Caps	95.0	98.1	98.1
Steel Sleeves	82.1	86.1	78.0

305 Area Test Pile

This unit was operated on a one-shift five-day schedule until May 17, after which it operated on a one-shift six-day schedule. Eighty-five tests were run on canned slugs, 75 on billet eggs, 406 on graphite bars, and the following on special work requests.

Request Number		Number of Tests
23	To obtain absorption cross-section of Amercote plastic paint.	3
24	To find an approximately average bar for each of six experimental heats and to determine its dih as accurately as possible.	30

Standards selected from "finished" graphite bars are now being used in testing all graphite of this grade. This was done because of the higher dih range of "finished" graphite as compared to unfinished graphite.

The number of sample bars per heat for "finished" graphite has been reduced from sixteen to eight bars.

Special Hazards

Approval was received to issue free-issue safety shoes to all personnel assigned to operations where shoe covers have been routinely required.

Development Work

On May 11, a billet having a machined surface was successfully extruded in the alpha phase through a three hole, bell-mouthed die having land diameters of 1.455". The billet was preheated in the rotary furnace

for sixty-five minutes at a temperature of 1180° F. The contact temperature reading on the billet was 1040° F prior to extrusion and it required a maximum pressure of 750 tons to extrude. Even though a 4" graphite wafer was inserted between the dummy block and the billet, it was necessary to saw the rods to remove them and the butt from the die. The die was observed to be cracked and further tests could not be made. The container used on this run was previously honed and burnished with powdered graphite.

Another attempt was made on the same date using a regular single-hole die (1.455" land diameter). Temperatures and other conditions were the same as above. The billet extruded approximately three inches at a pressure of 1000 tons.

On May 21, an additional attempt was made to extrude in the alpha phase. Two billets, one with a machined surface and the other normal, were preheated at a temperature of 1180° F. They failed to extrude at 1000-ton pressure through a three-hole bell-mouthed die having land diameters of 1.455". On the same date an attempt was made to extrude a machined surface billet under the same conditions, except for using a single-hole bell-mouthed die with a land diameter of 1.455". This billet also failed to extrude at 1000 tons pressure.

A supply of Zirconite mold wash material was received. Prolongation of mold life in the Melt Plant resulting from its use will be evaluated in the coming month.

S DIVISION

MAY 1948

OPERATING SECTION

I. GENERAL

Thirty-seven plutonium batches and eight neptunium isolation batches were started in the Canyon Buildings during ~~April~~ May, and forty-one plutonium batches were processed through the Concentration Buildings and the Isolation Building. The average purity for the completed plutonium charges was 98.8 percent.

The material balances for T and B Plants averaged 98.2 percent and 98.5 percent, respectively, for a combined average of 98.4 percent. Waste losses for the two plants averaged 2.7 percent.

Canyon and Concentration Building Production Performance Data — (5/1/48 – 5/31/48, inclusive)

	B Plant	T Plant	Combined
Number of charges started	15	22	37
Number of charges completed	22	19	41
For Completed Charges:			
Percentage of starting product in waste			
This month	2.8(a)	2.4(a)	2.7
Last month	2.7(b)	2.3(b)	2.5
Cumulative to date	5.2(c)	5.1(c)	5.1
Percentage of starting product recovered			
This month	95.7	95.8	95.7
Last month	94.8	97.4	96.2
Cumulative to date	97.0	95.6	96.4
Percentage of starting product accounted for			
This month	98.5	98.2	98.4
Last month	98.5	99.7	98.7
Cumulative to date	102.2	100.7	101.5
Gamma decontamination factor (log.)			
This month	7.52	7.65	7.59
Last month	7.78	7.61	7.67
Cumulative to date	7.32	7.27	7.30

(a), (b), (c): Include waste from processing recycle. The recycle wastes are estimated as: (a) 0.026%–T Plant; 0.037%–B Plant. (b) 0.025%–T Plant; 0.026%–B Plant. (c) 0.15%–T Plant; 0.0058%–B Plant.

S Division

Isolation Building Performance Data (5/1/48 – 5/13/48, inclusive)

	% of Incoming Product			
	Prepared for Shipment	Recycle	Losses	Material Balance
Average for this month	92.0	7.96	0.13	100.1
Average for last month	94.7	6.00	0.12	100.8
Average to date	96.3	4.11	0.11	100.5

II. ORGANIZATION AND PERSONNEL

Number of employees on payroll:

Beginning of month	308
End of month	300
Net decrease	8

Remarks: The changes which occurred in the S Division during the month of May are listed below:

3 Terminations (1 Monthly Roll, 2 Weekly Roll)
10 Transfers to other divisions (2 Monthly Roll, 8 Weekly Roll)
3 Transfers from other divisions (1 Monthly Roll, 2 Weekly Roll)
2 New Hires (1 Monthly Roll, 1 Weekly Roll)

Changes in supervisory organization:

D. E. Jenne, Senior Supervisor, Meteorology, was transferred to the Health Instrument Division as of May 1, 1948.

A. H. Hester, Engineer-on-Assignment, Meteorology, was transferred to the Health Instrument Division as of May 1, 1948.

William Watson, Jr., a new employee, joined the organization as Supervisor-in-Training on May 24, 1948.

H. A. Moulthrop was transferred from the Health Instrument Division to the S Division as an Area Supervisor on May 1, 1948. He was assigned to the Technical Division 234-5 Development Group on a loan basis.

III. AREA ACTIVITIES

PRODUCTION PERFORMANCE

T and B Plants

Volume Reduction – Production Test 221-T-B

Evaluation of Production Test 221-T-B involving the reduction of process volume at the end of the extraction step was continued. Starting with

1223506

S Division

Run T-8-05-F-11, a series of twelve runs was started with a ten percent volume reduction. Waste losses and decontamination on these runs have been normal and no operating difficulties have been encountered. The test will proceed on the basis of incremental reduction, with thorough evaluation at each stage.

Processing Class C Material — B Plant

Approximately six tons of Class C metal averaging 386 G/T plutonium was processed (nine batches) during the month at the request of the Atomic Energy Commission for the purpose of isolating the neptunium from the extraction wastes. In order to accomplish this processing in a minimum of time the product extraction was carried out in Section 7 and the extraction wastes were transferred to Section 8 for the neptunium extraction. The neptunium solutions were accumulated in Section 12 and processed in eight batches following the processing of the nine product batches. Extraction waste losses averaged 1.0 percent, which is lower than that (approximately 2.5 percent) experienced when processing Class C material in the past.

Acid Flush — B Plant

An acid flush B-8-05-D-13 was processed through the B Plant Canyon and Concentration Buildings. Investigation of abnormal product pick-up in Section 17 (approximately 45 percent of a normal run) led to the discovery that the precipitator tank spray had failed. It was necessary to replace the spray assembly.

Section D By-Product Cake Rework

The average cycle for Section D was reduced from approximately twenty-four to twenty hours during the month by the inauguration of a procedure which permits the by-product cake solution from two runs to be reworked simultaneously.

WASTE DISPOSAL

T and B Plants

Cribbing of Second Cycle Wastes

The cribbing of second cycle waste from the X-112-B tank was completed on May 13, 1948. On May 14, 1948, the X-106-B tank was filled to capacity and second cycle wastes were again diverted to the X-110, 111, 112-B tank series.

As reported last month additional second cycle cribbing will be dependent upon the underground movement of the cribbed activity, as indicated by the comprehensive soil sampling program being carried on by the H.I. Division.

1223507

S Division

Crib and Tile Field — 221—B Cell Drainage Water

Work on Project C—225 which covers the installation of a crib and tile field for handling the cell drainage water from 221—B was continued during the month. The tile field, crib and approximately 75 percent of the stainless steel inlet line have been installed but not backfilled. It is expected that the installation will be completed during the coming month.

241—TX Tank Farm — Project 163

Work in the sub—contractor's phase progressed satisfactorily during the month. All steel for the eighteen tanks is in place and two tanks have been completed except for hatchways and risers. X—ray inspection has been completed on nine tanks and the gunite has been applied to five tanks. The second and third pours at diversion box 153—TX were completed and the catch tank was set in place. Several hundred encasement blocks were poured for General Electric.

In the General Electric phase the piping installation between diversion boxes 154—TX and 155—TX is complete and hydrostatic testing is in progress. The piping installation between diversion box 155—TX and the 151—U and 152—U diversion boxes is approximately 90 percent complete, and the piping between the 221—T Building and the 154—TX diversion box has been started. Pouring of the three line encasement from the 155—TX diversion box to 241—T, and the seven line encasement from 154—UX diversion box location to the 155—TX diversion box is in progress near the 155—TX box. Completion of the tie—in between the 221—T Building and the 241—U waste storage area is expected to be completed during the forthcoming month.

Waste Status

The status of the Waste Storage Areas on May 30, 1948, is shown in the following table:

B Plant

Bldg. 241 Tanks	Waste	Percentage Full			Reserve Capacity In Batches to Process			
		B	C	BX	B	C	BX	Total
x101,2,3	Metal	100	100	30.4	0	0	187	187
x104,5,6	Metal	—	100	0	—	0	269	269
x201,2,3,4	Metal	0	100	—	—	0	—	—
x107,8,9	1st Cycle	100	77.5	0	0	76	338	414
x110,11,12	1st Cycle	—	100	—	—	0	—	—
x104,5,6	1st Cycle	—	—	—	—	—	—	—
x104,5,6	2nd Cycle	100	—	—	—	—	—	—
x110,11,12	2nd Cycle	69.8	—	0	137	—	454	591

1223508

S Division

T Plant

Bldg. 241 Tanks	Waste	Percentage Full T	U	TX	Reserve Capacity In Batches to Process T	U	TX	Total
x101,2,3	Metal	100	100	—	0	0	—	—
x104,5,6	Metal	—	67.6	—	—	87	—	87
x201,2,3,4	Metal	0	0	—	—	37	—	37
x107,8,9	1st Cycle	100	0	—	0	338	—	338
x110,11,12	1st Cycle	—	100	—	—	0	—	—
x104,5	1st Cycle	76.2	—	—	54	—	—	54
x104,5,6	2nd Cycle	—	—	—	—	—	—	—
x110,11,12	2nd Cycle	79.3	—	—	94	—	—	94
x106	2nd Cycle	100	—	—	0	—	—	0

MECHANICAL PERFORMANCE

Agitator Replacements — T Plant

The agitators on precipitator tanks in Sections 8 and 14 failed during the month. Replacements were installed without incident by standard remote crane methods. Radiation levels have prevented the determination of the exact cause of these failures. Both of these agitators were a part of the original installation.

Skimmer Replacement D-2 Centrifuge — T Plant

The skimmer in the D-2 centrifuge failed and was replaced with a reinforced skimmer. This centrifuge still contained a plow. Advantage was, therefore, taken of the opportunity to install a skimmer in the plow position.

Section 13 Process Leak — B Plant

As indicated by the conductivity meter and analysis of the cell drainage water, a leak was located in the by-product waste transfer line (13-2 to 13-4 jet assembly) in Section 13. The necessary replacement was made and the section restored to normal operation with no undue difficulties.

Adjustment Tank Replacement — 231 Building

The adjustment tank, now used as a sampling tank, developed a small leak in the tank bottom and was replaced after an unsuccessful attempt was made to repair the leak by welding.

SPECIAL HAZARDS

Stack Gas Contamination

Due to the urgency of the stack gas contamination problem, design and construction of stack gas purification facilities was started during

1223509

the month. The general design of the buildings, which will permit maximum flexibility, has been agreed upon and excavation for the building foundation was started in the 200 West Area. In general the buuldings, which have been assigned the numbers 293-B and 293-T, will consist of two banks of six cells each so designed that they can accomodate various types of purification units operating in parallel or in series and receiving the stack gas from the discharge of the present stack fans. The stack gas from the purification units will be discharged to the stacks (it is possible that new stacks which are not contaminated will ultimately be required) through additional fans which will be required to provide adequate pressure differential through the purification units. Design work on the purification units although not fixed is progressing. Consideration is being given to several types of units. Industrial experience in gas purification to the degree required appears too limited. The experimental program is, therefore, being continued and consultation with authorities in the gas purification field is being sought.

The status of other work on the stack gas contamination problem follows:

Stainless steel ducts for the steam driven fan at 291-B were installed during the month. Fabrication of the ducts for the 291-T steam fan was completed and installation will be made early in June. This will complete the removal of the black iron from the 291-B and 291-T systems.

Type 6, C.W.S. filters were installed on the air tunnel drains to the deep cell in both Canyon Buildings but no significant effect was noted.

Scrubber installations have been completed in all operating dissolver cells in both T and B Plants. Operation of these units have been very satisfactory. Visible fumes from the stacks have been virtually eliminated and data obtained to date indicates that 99 percent of the active iodine and 50 percent of the nitrous oxides are removed. A very marked reduction in the activity of the dissolver off-gas has been effected.

Work is in progress on the site for the installation of the experimental electrostatic precipitator, The delivery of this unit is expected early in June.

Restriction of the air flow to the process cells in 221-T Canyon reported last month was extended to include the inactive as well as operating cells and the orificing of the tank vents in the 224-T Concentration Building. The purpose of this move is two-fold: (1) To decrease the entrainment of mist and particles from the process vessels; and (2) to determine the minimum amount of air which will have to be handled in the 293 Buildings.

One C.W.S. Type 6 filter was installed in a process tank vent header at 224-B. Rapid saturation of the filter medium, however, and attendant spread of contamination made continued evaluation impractical. At present a four foot, twelve inch diameter packed column is being installed at this location for further testing and evaluation.

S Division

DESIGN AND CONSTRUCTION CONSULTANTS SECTION

Redox

During May the scope of work of the Kellex Corporation relative to Redox design activity was revised to conform to latest developments in the Redox program.

In order to provide a more realistic basis for test plant design and the preparation of the studies requested from Kellex, the preliminary design basis issued earlier in the form of Specification Letters was reviewed and modified by representatives of the Design, Technical, and Manufacturing Divisions. The revised design requirements, as well as the presently conceived objectives of the test plant are contained in Document HDC-426. The basic change was essentially one of simplification of the process flowsheet, thereby making possible a reduction in the complexity of engineering design.

Concurrent with the release of the revised design requirements for the test plant, a similar review was made of the production plant process flowsheet and design criteria for the purpose of providing the Kellex Corporation with minimum design requirements to be used as a guide in the preparation of an engineering feasibility report. The design requirements arrived at are contained in Document HDC-427 and, in general, emphasize the Company's desire to obtain the following:

1. The range of facilities required to obtain the complete scope of services and functions for satisfactory process performance.
2. A maximum guarantee of safety in both process and maintenance operations.
3. A large factor of versatility and flexibility in the use of permanently installed facilities to provide for possible future changes in process and engineering flowsheets.

Area Laundry

April's Monthly Report erroneously stated that the revised study and estimate for the proposed 200 Area protective clothing laundry facility had been submitted to Management for approval. The report is still in the hands of the Design Division; its release is expected some time in June.

POWER DIVISION
MAY 1948

GENERAL

High winds, lightning storms, and flood water caused several interruptions of service in the plant and Village power areas, beginning May 26 through May 31.

On May 20 a transfer of operation responsibility was made when the operation of the No. 1 heating plant in the 3000 Area was taken over by the Atkinson-Jones Co., sub-contractors, and the operation of the North Richland water supply and distribution system was assumed by the Power Division.

The change in above responsibilities, together with the cessation of heating season for the Pasco Depot, made available fifteen operators and one area supervisor, who were transferred to the 100 Areas.

PERSONNEL AND ORGANIZATION

Number of employees on payroll	May
Beginning of month	489
End of month	486
Net decrease	3

The above decrease of three employees is the result of the termination of four operators, inter-departmental transfer of one operator into the Power Division, the transfer of one employee out of the Division, and the hiring of one stenographer.

100 AREAS

On May 10, the ten million gallon reservoir in the D Area was drained for inspection and cleaning.

The South clearwell in D Area was inspected during the week ending May 16. Several small leaks were discovered and repaired.

Concrete encasements over the 30-inch export line for the highway and railroad crossings serving H Area, in the vicinity of White Bluffs, were completed during the week ending May 9.

At the request of the "P" Division the process water flow through the F Area pile was reduced to 5000 gpm on May 12, to 3500 gpm on May 18 and 30, and to 2000 gpm on May 26 and 30. Operation of all equipment was satisfactory during these periods.

Power Division

It was necessary to remove the No. 6 pump in the F Area process water pump room from service on May 19 due to motor failure. The motor was removed to area shops for repairs. A similar failure occurred on the No. 4 pump in D Area on May 21. Both motors failed while being started.

On May 22 a power surge, caused by a crane in the DR Construction area swinging into the 13.8 KV feeders, caused the fire and sanitary pumps and the motor generator sets in the D Area to trip off.

Operation of the power equipment in the 100 Areas was affected by severe electrical storms on May 26 to 28, inclusive. Critical power conditions, grade "Y", were in effect during the critical periods.

High winds on May 26 blew off six concrete roofing slabs from the D Area process water tank room roof. Repairs have been made and steps are being taken to anchor similar roofing slabs to prevent a recurrence.

Due to flood stage, high turbidity river water and subsequent failure to maintain desired process water quality, it was necessary to resume operation of all filters in the D and F Areas.

In D Area, the eleventh filter was added on May 26, and the twelfth and thirteenth on May 29. Coagulant was gradually increased to a high of 65 ppm, and iron residual in the valve pit reached a maximum of .07 ppm. In F Area, the eleventh and twelfth filters were placed in service on May 29. Coagulant was increased to 55 ppm, and iron residual reached a maximum of .06 ppm in the valve pit. The B Area increased coagulant to 50 ppm and reached a maximum iron residual of .09 ppm in the valve pit.

Flood water caused considerable ground settlement around the river pump houses in all areas. Backfill of depressions has been started.

Difficulty was encountered in D and F Area river pump houses on May 29 due to mud accumulation on intake travelling screens, causing shear pins to break at F Area, and a bull gear failure at D Area. Repairs are being made to gear.

Design and Construction Division has completed relocation of fire and sanitary water line to the D Area pile building warehouse fire hydrant, and the filtered water and fire and sanitary water line to the gas purification building, preparatory to new construction for DR.

200 AREAS

A new 8-inch sanitary water supply line connection was installed on existing main near the Isolation Building in the West Area. Proposed line from this connection will supply a future process building in this vicinity.

Five electrical power interruptions occurred on the emergency feeder in the West Area on May 5. It is believed they were caused by sagging wires making contact during high wind storms.

1223513

Power Division

A total electrical power outage affecting the East, West, and North Areas occurred on May 8.

300 AREA

The new No. 4 well was placed in service on May 13 and was operated intermittently until May 24 when it was removed from service at the request of the Health Instrument Division.

700 AREA

Operations normal.

1100 AREA

The Bus Garage heating plant was removed from service and placed in a standby condition on May 31.

The No. 3 Village irrigation system was out of service from May 5 to May 14 while repairs were being made to pumping station supply flume. This system was again taken out of service and the pump motors removed from the building due to threatening flood waters on May 28.

Two service lines on the Hains Avenue sanitary water main were broken during construction of flood dike on May 31. Repairs were made and service restored the same date. Flood stage river level beginning May 27 and reaching a high level elevation of 355.8 feet at Lee Boulevard on May 31 caused abnormal sewerage plant operations. It was necessary to construct a dike on the river side of the plant and pump entire effluent over during this period. It was also necessary to protect the lift station with a dike. Infiltration of flood water imposed a heavy load on both the lift station and disposal plant, which was at a peak of 3.4 mgd on May 31.

MISCELLANEOUS POWER OPERATION

Due to seasonal warm weather the Pasco Storage Depot boiler house and all oil heating furnaces in the warehouses were taken out of service on May 24.

The new "A" and "B" wells at North Richland were placed in operation on May 31.

POWER DIVISION STATISTICS

From May 1, 1948
Through May 31, 1948

			AREAS		
			100-B	100-D	100-F
RIVER PUMP HOUSE (Building 181)					
River stage Feet above sea level		(max)	413.2	400.8	388.9
		(min)	394.0	384.8	371.1
		(avg)	400.0	390.1	377.0
River temperature	avg. °F.		48.0	47.3	47.3
Water pumped to Reservoir	gpm avg. rate		13819	37945	36185
Water pumped to Refg. Condensers	gpm avg. rate			0	0
RESERVOIR (Building 182)					
Water pumped to Filter Plant	gpm avg. rate		13100	32154	30701
Water pumped to Condenser System	gpm avg. rate		719	3810	3872
Water pumped to Export System	gpm avg. rate		0	1981	1612
	gpm normal rate		3593	3593	3593
Chlorine added at #1 inlet	pounds		8102	19492	12000
FILTER PLANT (Building 183)					
Filtered water to Power House	gpm avg. rate		97	288	240
Filtered water to Process	gpm avg. rate		10404	27626	28119
Filtered water to Fire & Sanitary	gpm avg. rate		92	147	144
Chlorine used in Water Treatment	pounds		2945	2638	5400
	ppm avg.		2.2	1.60	1.36
Lime used in Water Treatment	pounds		31517	104580	86000
	ppm avg.		6.5	8.7	7.5
Coagulant used in Water Treatment	pounds		107866	289700	238000
	ppm avg.		22.1	24.2	20.8
Raw Water pH	pH avg.		7.63	7.81	7.9
Finished Water pH	pH avg.		No analysis	7.38	7.40
Alkalinity, M. O. - Raw	ppm avg.		55	57.1	56.0
Finished	ppm avg.		51	52.6	52.0
Residual Chlorine - Settled	ppm avg.		.32	.14	.22
Finished	ppm avg.		.05	.10	.14
Iron - Raw	ppm avg.		.73	.83	.70
North Clearwell	ppm avg.		No analysis	.03	.03
South Clearwell	ppm avg.		No analysis	.04	.03
Hardness - Finished	ppm avg.		69	73.5	78.0
Turbidity - Raw	ppm avg.		39.0	42.0	31
Filtered	ppm avg.		.38	0	0
REFRIGERATION (Building 189)					
Refrigeration produced	Tons per day			0	0
Temperature, Process Water In	avg. °F.			-	-
Temperature, Process Water Out	avg. °F.			-	-

1223515

Power Division

From May 1, 1948

Through May 31, 1948

POWER HOUSE (Building 184)

Steam generated - Total	M pounds	30869	100470	86432
Average rate	lbs./hr.	41490	135040	116172
225 psi Steam to plant (est.)	M pounds	27164	88170	75950
15 psi Steam to plant (est.)	M pounds	0	244	110
Coal consumed	Tons	1934	6359	5840
Coal in storage (est.)	Tons	24782	36841	35290

DEAERATOR PLANT (Building 185)

Water flow	gpm avg. rate	10154	27336	27869
Chemicals consumed:				
Dichromate	pounds	9944	20700	21600
Sodium Silicate	pounds	75145	206291	214880
Chemical Analysis:				
pH	pH avg.	7.64	7.64	7.69
Dichromate	ppm avg.	No analysis	1.91	2.00
Silica	ppm avg.	No analysis	5.64	5.5
Dissolved Iron	ppm avg.	.03	.034	.03
Free Chlorine	ppm avg.	.08	.095	.10

PROCESS PUMP ROOM (Building 190)

Total water pumped	gpm avg. rate	10119	27161	27694
	gpm normal rate	10119	31424	31233
Water temperature	avg. °F.	52.3	50.0	50.0

VALVE PIT (Building 105)

Chemicals consumed:						
Solids		pounds		0	0	1900
Chemical Analysis:						
A, B, C, & D Headers						
	Standard limits					
pH	7.5-7.8	pH	(max)	7.70	7.70	7.70
			(min)	7.60	7.50	7.60
			(avg)	7.64	7.64	7.65
SiO_2		ppm	(max)	6.5	6.5	6.0
			(min)	4.5	5.0	5.0
			(avg)	5.3	5.8	5.5
$Na_2Cr_2O_7$	1.8-2.2	ppm	(max)	2.1	2.0	2.1
			(min)	1.8	1.8	1.9
			(avg)	2.0	1.9	2.0
Iron		ppm	(max)	.07	.06	.04
			(min)	.01	.02	.01
			(avg)	.03	.03	.02
Chlorides		ppm avg.		2.0	1.89	1.5

Power Division

From May 1, 1948

Through May 31, 1948

	Unit	200 Areas	
		200-E	200-W
RESERVOIR (Building 282)			
Raw Water Pumped	gpm avg. rate	1768	1824
FILTER PLANT (Building 283)			
Filtered Water Pumped	gpm avg. rate	423	390
Chlorine Consumed	lb.	233	243
Alum Consumed	lb.	2715	2740
Chlorine Residual - Sanitary Water	ppm	.6	.5
POWER HOUSE (Building 284)			
Steam Generated - Total	M lb.	16094	27122
Steam Generated - Ave. Rate	lb./hr.	21632	36454
Coal Consumed (Est.)	tons	1150.	1906.7
Coal in Storage (Est.)	tons	9890.	12994.7

		300, 700, 1100 Areas		
		300	700	1100
POWER HOUSE (Buildings 384 and 784)				
Steam generated - Total	M lb.	8375	18179	
Steam generated - Avg. Rate	lb./hr.	11257	24434	
Coal Consumed - Total (Est.)	tons	577.5	1383.5	
Coal in Storage (Est.)	tons	1283.2	3514.2	
SANITARY AND FIRE SYSTEM (1100)				
Well Water Pumped - Total	gal.			130,131,000
Well Water Per Day	gal/day			4,198,000
Well Water	gpm avg. rate			2,915
Chlorine Residual	ppm			0.2
SEWAGE TREATMENT PLANT (1100 Area)				
Total Sewage Treated	gal.			70,600,000
Sewage Treated Per Day	gal/day			2,277,000
Sewage Flow	gpm avg. rate			1,582

1223517

MAINTENANCE DIVISION

May, 1948

GENERAL:

There was one sub-major in the Maintenance Division on May 10 when a mechanic in 100-D Area fell from a five foot platform and incurred a fracture of the vertebrae.

The Morrison Knudsen Company has completed the outside tank farm installation on the Redox scale-up unit. Project forces will complete their work on the equipment inside Building 321 early in June.

Minor Construction started May 29 to construct a new building in both the 200 East and West Areas, to house equipment for removing contaminated particles from the exhaust air from the 221 Canyon Building cells.

The responsibility for completing the work remaining on the air conditioning of dormitories was transferred to the Village Public Works organization. Twenty mechanics were loaned to this group to assist them in completing this work.

ORGANIZATION AND PERSONNEL:

Employees on Roll	May
Beginning of month	702
End of month	699
Net Decrease	3

WORK ORDER SUMMARY:

Area	Backlog Mandays 6-1-48	Men on Roll	Backlog Days 6-1-48
100	3482	123	28
200	5224	159	33
300	1237	75	16
700	2640	95	28
M.C.	14420	132	110
Total	27003	584	43 (Avg.)

The total backlog increased from 19251 to 27003 during the month and the average number of days to complete all work was raised from 31 to 43 days. This increase in backlog was due to additional new construction work and the loaning of twenty mechanics to the Village Public Works organization.

1223518

100 AREAS:

A V.S.R. light rod limit switch for the 105-B unit fabricated and installed by Maintenance according to Design and Construction specifications was tested satisfactorily.

The removal of production equipment from layaway status in 100-B Area was partially completed during the month; the completed items shown below:

Building 105	#4 and #5 Inlet Fans #7, #9 and #10 Exhaust Fans All gas sampling pumps.
Building 115	#2 Inlet Fan #1 Purification Room
Building 181	#6, #7, and #16 Steam Driven Pomona Pumps
Building 182	#4 Emergency Turbine Driven Pump #6, #7, and #8 Filter Plant Supply Pumps
Build ng 183	#3 Emergency Turbine Driven Filtered Water Pumps #3 and #4 Lime Feeders #3 and #4 Coag. Feeders North half of Filter Plant
Build ng 184	#3 and #4 Steam Generators
Building 185	#1 through #10 Acid Pumps

The far rear vertical Neoprene gas seal in the 105-D unit was replaced. The far side cork expansion joint between the unit and the shield wall was removed to provide free movement of the unit. Twenty-two V.S.R. bumper blocks were raised 4½" to provide additional clearance for the V.S.R.'s when they are in the "down" position as the thimbles are filling with rust. A 1" X 8" X 40' steel plate was installed in front of the open joint at the top of the unit to provide additional shielding at the rear face.

The four-inch Fire and Sanitary water line and the six-inch filtered water line supplying Building 115-D were relocated in accordance with drawings furnished by D & C. The relocation was necessary to permit construction of the 115 to 105 DR tunnel.

Six V.S.R.'s in the 105-F unit did not go all the way in the unit due to the accumulation of rust at the bottom of the thimbles. A commercial vacuum cleaner and filter arrangement were constructed to remove the rust from the thimbles. These rods are now functioning properly. Process tube #3576 was replaced with a tube of the type to be used in the DR Pile. The #2 section of #30 V.S.R. was replaced due to the rod splitting at the dowel pin hole.

Three experimental test hole thimbles were fabricated and delivered to Spare Parts.

1223519

3 Maintenance Division

Seven cyclone separator tanks were fabricated for vacuum cleaning equipment used in cleaning V.S.R. thimbles.

Work was continued on the fabrication of V.S.R.'s for 105_DR unit.

200 AREAS:

The installation of stainless steel duct work on the "B" Canyon steam driven exhaust fan was completed. All fans and ducts at this location are now equipped with stainless steel.

The original skimmer in D-2 centrifuge "T" Concentration Building failed in service and was replaced with an improved design. At the same time, the plow was removed and replaced with a skimmer.

To aid in the control of contamination in the "T" Concentration Building the floors were cleaned and repainted with "Amercoat" in cell F-10, F-10 Operating Gallery, and cell C, D, and E.

The "A-T" process tank in cell 3 of the Isolation Building was replaced. A welded joint in the bottom of the tank had failed.

Chamber wells were fabricated and installed in three waste storage tanks in "U" Area.

Fabrication of eight poppy carts for H.I. was completed in the West Area shop.

A 40" centrifuge was made ready for Canyon Building installation and run-in by the East Area shop.

300 AREA:

Due to a change in the process, the canning facilities in Building 313 were revised by the installation of four centrifuges and the change of crucibles, pedestals, steel rings and handling equipment.

Two special dies were made for the extrusion press in Build ng 314 -- a single hole die which proved unsatisfactory and a three - hole die through which a trial extrusion was successfully made.

Revisions to the Demonstration Unit in Building 321 included fittings for the 3" column, the installation of a 10" centrifuge, repiping to the F4-B and F3-B scale tank and the partially completed installation of auxiliary head tanks.

700 AREA:

Various partition changes were made in the 703 Building to accommodate AEC and General Electric office personnel.

Three offices were installed in the 722-A Building for Electrical Department supervision.

4 Maintenance Division

Two offices were installed in the 723 Laundry Building for Service Department supervision.

The interior painting program at the Kadlec Hospital is twenty percent complete

Two Quonset metal huts were erected in the 1125 Labor Yard for the Stores Department.

122521

PROJECT ENGINEERING DIVISION

MAY 1948

GENERAL

The Project Engineering Division has as its responsibility design, studies, project proposals and related engineering duties connected with authorized requests for work emanating from the Hanford Works Plant.

Engineering Items of Major Importance Actively progressing in the Various Areas for the Month of May are as follows:

100 Area

Project C-238. Building 105 F - 107 F Effluent Sewer Line

The original concrete line had no effective expansion joints and has been giving considerable trouble from leaks. Extensive patching has been necessary. A Steel replacement line over an uncontaminated route was designed with necessary expansion joints. This will allow continued operation during the construction phases, and make possible the preservation of the existing line for possible use as a spare. Field work is progressing.

Project C-184. Animal Farm

Designs are 52 percent complete with architectural practically finished and plumbing and ventilation progressing as rapidly as possible. Electrical drawings have not been started and special laboratory equipment design is only about 25 percent complete. It is anticipated that plans and specifications will be finished by July 15, 1948.

E. R. A-1055. Radiation Shield for 105 D and F Buildings

This shield is necessary to cover a radiation beam and required careful consideration in design of brackets and the overlapping layers of steel and masonite. The completed drawings are now out for approvals.

200 Areas

Project C-133. Special Test Wells

Current problem is in connection with the soil sample which is required to be taken through the casing wall, after which, the small

1223522

hole is to be sealed with a special material. One sample device has been demonstrated and certain improvements are desired. This device will be used by H. I. Over an extended period after all 72 wells have been completed.

E. R. 2377. Stack Gas Decontamination

The ground stabilization program through seeding and irrigation has been set aside in favor of allowing the growth of native grass and eliminate the contamination nearer the source through gas scrubber units and cell filters. The latter designs are being rushed to completion by the use of all available manpower and this job is assigned the highest priority because of the threat to continuity of plant operation. Field work has been started in 200 E & W on latest design.

300 Area

E. R. A-3050. 300 Area Rolling Mill

Approximately eight arrangement proposals have been drawn up and discussed. Further development on this project depends on the results of a trip taken by two of the engineers of this division.

700 - 1100 Areas

Project C-128. Richland Telephone Exchange

Design is complete with the exception of ventilation in the existing building. Building structure nearing completion.

Project C-177. 115 KV Power Transmission Line

Design work is 67 percent complete. During the past month the temporary substation in the 300 Area was designed and built; completed plans for the transmission line through Village and 300 Area 115 KV substation were turned over to the Construction Divisions. Design work has been started on the modification of Richland distribution lines.

Project C-214. Rehabilitation of Plant Railroad

Design work is progressing concurrently with field surveys for realignment and leveling of tracks. The new fill at May Junction is completed and the fill at Prosser Road is progressing. Only a few miles of track have been realigned to date.

E. R. A-452. Expansion of Main Plant Telephone System

Overall design work is about 10 percent complete. The Williams Boulevard underground conduit system is under construction and other underground conduit systems in the 1100 Area are 75 percent complete in design and field layout. The initial design of the standard telephone exchange buildings for the areas was completed and the cost estimate for the project is now being prepared.

1223523

Project Engineering Division

PRESENT STATUS OF WORK

Projects, Suspense Codes Authorized and Under Construction

100 AREAS

Project Number		% Phys. Complete	Date Auth	Est. Cost
C-172	Dismantling of Equipment in Demineralization and Deaerating Plants	5	8-19-47	$ 486,000
C-184	Experimental Animal Farm	0	10-27-47	286,000
C-213	Fire Protection Riverland Shop	0	1-13-48	8,200
C-222	Dismantling Unoperated Equipment in 105 Valve Pits	5	2-10-48	4,000
C-238	Effluent Sewer Line 105 F to 107 F	5	3-26-48	207,000
	TOTAL Estimated Cost 100 Area Projects			$991,200

200 AREAS

C-120	Divert Second Cycle Waste From X-110 (N ow awaiting results of H. I., Studies on Soil Sampling)	98	1-15-47	134,200
C-133	Special Test Wells 200 E & W	64	1-30-47	180,600
C-160	H. I. Shaft at 241 B	100	7-14-47	19,000
C-163	Additional Waste Storage and Tie Lines - 200 W (G.E.Portion Only - Subcontract not included)	54	7-25-47	500,000
C-171	Alterations to Six Periscope Assemblies	54	8-6-47	7,200
C-192	Biology Laboratory (Transferred to Design & Construction Divisions)	0	2-3-48	590,000
C-216	Addition to Building 2707 EA	90	2-2-48	4,170
C-225	5-6 Waste Disposal to Ground	20	- - - -	34,000
C-255	Temporary Technical Office Bldg 2707Z	0	5-19-48	13,800

3.

Project Engineering Division

Projects, Suspense Codes Authorized and under Construction (Cont'd)

200 AREAS

Project Number		% Phys. Complete	Date Auth.	Est. Cost
SC 10155	Physical Testing Equipment	65	- - - -	- - - -
SC 10225	Stack Filtration Facilities 200 E & W. Additional phases contemplated	33	- - - -	- - - -
	TOTAL Estimated Cost 200 Areas Projects			$1,469,170

300 AREA

C-127	300 Area - Increased Capacity of Telephone Exchange (Elect. Div. will procure and install equip)	0	5-12-47	30,000
C-142	Metal Casting Facilities Parts I & II	97	4-7-47	188,000
C-189	Building 3745-A X-Ray Fac.	91	8-20-47	22,000
C-207	Fire Alarm System for Bldg 3706 and 3717	70	11-19-47	5,450
C-219	Construction of Additional H. I. Instruments	0	1-27-48	97,200
C-220	Optical Building and Elect. Shop 3708 - 300 Area	23	1-30-48	81,900
C-223	3703 Office Building Unit for Tech. (Trans. to Const. Divs)	0	3-1-48	93,000
C-227	Conversion of Offices to Labs. Bldg. 3706 & 3707-C Change House	7	3-15-48	429,000
C-237	Nine Tube Mock Up Bldg. Part II in Preparation	70	4-12-48	106,000
	TOTAL Estimated Cost 300 Area Projects			$1,052,550

1223525

Project Engineering Division

Projects, Suspense Codes Authorized and Under Construction (Cont'd)

700 - ADMIN. & GENERAL PLANT AREAS

Project Number		% Phys. Complete	Date Auth.	Est. Cost
C-138	Bldg. 702 - Automatic Dial Exchange (Elec. Div. will Procure & Install Equip.)	3	5-12-47	$ 470,500
C-144	Additional Telephone Cables - Richland (Material partly received, but no installation work started)	0	5-12-47	45,000
C-148	Combined Maint. Shops 700 Area Parts I & II	92	6-25-47	188.000
C-175	Bldg. 703 Freight Elevator	97	7-29-47	9,400
C-177	115 KV Power Line Through Richland Parts I & II. (Subcontract work transferred to Construction Div.)	0	8-14-47	1,167,000
C-195	Radio Communications for R. R. Dispatching	34	10-15-47	34,000
C-196	Electrical Distribution Hdqts. Bldg. & Conversion of 2713 E to Garage	0	10-10-47	162,400
C-202	Gate House & Parking Lots - 700 Area at Stevens Dr. & Swift Blvd.	91	11-7-47	31,500
C-209	Two Story Addition to Bldg. 703	96	12-3-47	140,000
C-214	Rehabilitation of Plant Railroad	2	2-18-48	3,214,000
C-229	Office Machine Repair Shop Hut 722L	1	3-26-48	3,700
C-243	Painting & Improved Lighting Bldg 721	99	4-5-48	5,200
C-256	Seal Coating of 36 Miles of Plant Highway	0	5-18-48	75,000
	TOTAL Estimated Cost for 700 Admin & General Plant Areas			$5,545,800

5.

Project Engineering Division

Project, Suspense Codes Authorized and Under Construction (Cont'd)

1100 AREA

Project Number		% Phys Complete	Date Auth	Est. Cost.
C-134	Richland Village Dust Control & Landscape Program 1947 to June 1948 (Grass Planting to be Subcontracted)	53	12-19-46	$ 250,000
C-146	Irrigation Extensions - Village	86	3-28-47	90,000
C-158	Air Conditioning All Dorms Except W-4 and W-13	35	7-28-47	136,800
C-186	Overhead Doors - 1131 Garage	90	8-26-47	5,500
C-210	Automatic Traffic Signals - Richland (Being Transferred to Design and Construction Divisions)	0	3-4-48	7,900
C-218	Patching & Seal Coating of Village Streets	0	5-13-48	78,600
C-242	Installation of Mail Boxes - All Dorms (Equipment on Order)	0	4-5-48	5,600
C-245	Remodeling of Tract House L-859	0	4-15-48	7,000
C-254	Painting of 514 Permanent Type Houses	0	5-13-48	96,000
	TOTAL Estimated Cost 1100 Area Projects			$677,400
	TOTAL Estimated Cost for Active Approved Projects - All Areas			$9,736,120

Project Being Routed for Authorization

E. R. No.			Estimated Cost
A-453	(C-253)	Roof Replacement - Domestic Water Reservoir - Richland	$ 78,700

6.

Project Engineering Division - Area Reports

Status of Engineering Study & Design Work in Progress During Month of May

100 AREAS

E. R. No.		% Engineering Complete
A-1004	Downcomer Design 105-F	20
A-1012	Physical Bend and Tension Testing Machine	82
A-1034	Alterations to Bldgs 186 and 185	17
A-1044	Outlet Charging Device	55
A-1046	Spectrometer Mount	60
A-1048	Revise Gas Circulating System Bldg. 105	50
A-1051	Remove Equip. in Valve Pits Bldgs. 105 B&F	52
A-1052	Study 2nd Effluent Sewer Line 105 F to 107 F and Recommend New Installation	82
A-1054	Design Roller Flanging Device for Van Stone Joints	50
A-1055	Design and Estimate a Radiation Shield for Top Far Side of 105 D and F	75
A-1057	Prepare Project for Earth Crib 100 B & F	10
A-1058	Study & Est. Cost of Preparing "B" Area for operation Devise Charge Code System	90

200 AREAS

2279	Prepare Project for Regasketing Facilities 221-T & B	72
2285	"B" Jet Assembly	75
2288	25 Additional Special Test Wells (Part II of Project C-133)	85
2287	Study Rail Alignment of 200 N. Cranes	70

1223528

Project Engineering Division - Area Reports

Status of Engineering Study & Design Work in Progress During Month of May (Cont'd)

E. R. No.		% Engineering Complete
2305	Study & Recommend Facilities & Procedure for Working Diversion Boxes	95
2309	Water Supply & Plumbing - 622 Bldg. (Project Being Prepared)	95
2326	Mark Grade on Steam Line Supports 200 W	0
2327	Study Possibility & Redesigning Connector Head to Simplify Gasket Changing	70
2333	Study and Recommend Outer Roller Bearing for 30 Ton Crane - Report Prepared	90
2343	Design Equipment Decontamination Station for Small Items 221B	95
2344	Design Equipment Decontamination Station for Small Items 221T	95
2353	Crane Alignment & Rail Elevation 221T	70
2354	Design Sampler to Simplify Sampling 221	100
2355	TX Waste Storage	45
2363	Revise Trombone Type Sampler 221-B	0
2368	Study & Recommend a Means of Preventing Steam Cell Piping From Creeping Through a Concrete Wall	50
2369	Prepare Project to Install Manifold Outlet Piping Tank Baffles to Permit Future Use of Remaining 3-200 Series Tanks for 224-T and B Waste	80
2371	Design Canyon Decontamination Sink & Piping 221T and B	95
2372	292-B Annex to Scrubber Facilities	70
2373	Design Safety Shower for G Cell 224-T	100

8.

Project Engineering - Area Reports

Status of Engineering Study & Design Work in Progress During Month of May (Cont'd) 200 Areas

E. R. No.		% Engineering Complete
2374	Estimate Cost of Providing Parallel Operation of Cell "B" & "E" & "G" & "F" in 224-T	10
2375	Adapt "Q" Smith Sampler Principles to 221 Bldg. Sampler Compartments - Cancelled	0
2376	Cathodic Protection to Underground Waste Lines (Survey Work and As-Built Drawings)	90
2378	Design Precipitator Tanks with Longer Life Jackets 221 T & B	70
2380	Study Sanitary Septic Tank & Tile Field Overload Conditions at 200 E & W Process Areas - Transferred to Design Division	10
2381	Design Acid Supply Tanks & Piping for 222B	50
2387	Piping Changes E-I-Y Tank 224-T	20
2389	Air Conditioner - 622 Building	85
2393	Steam Jet with Remotely Removable Features	0
2395	Prepare Project for Bismuth Subnitrate Preparation Facilities	90
2397	Specify 1-1/2" Pipe from Car Spot to 181 Tank 211 T	60
2398	Industrial Burial Ground 221 T & B	50
2399	Redesign Poppy Carriage 221 T & B & 231	100
2400	Maintenance Hoist for Cranes 221 T U B	5
2401	Maintenance Hoist for Cranes 212 N P R	5
2402	Gib Crane Over Axelson Lathe 272-E	100
2403	Revision of 222 T & B Control Labs.	10

1223530

Project Engineering - Area Reports

Status of Engineering Study & Design work In Progress During Month of May (Cont'd)

200 AREAS

E. R. No.		% Engineering Complete
2406	Provide and Erect Temporary Office Bldg Near 231 W	80
2408	Seeding, Irrigating and Blacktopping Contaminated Ground - Pending	20
2410	Determine Settlement of 221U, 222U, and 224U Bldgs.	100
2411	Detail Duct "Y" Damper 231-W Vent. System	100
2413	Study & Recommend Relief From Congested Conditions in 2723-W	15
2414	Separation & Control of 231-W Process Wastes	0
2415	Air Filtration, Cooling & Heating Facilities for 2701-W, 2709-W, and 2720	0
2416	Plant Mounting Press Design	0
2417	Location Determination for Zone Signs & Directional Markers over BX Lines	0
2418	Field Survey Work on Sewer Relocation 231-W	100
2419	Distributor Assembly Design of Greater Strength	100

300 AREA

A-3019	Housing for X-Ray Machine	98
A-3036	Designs for Construction Optical Instrument Building 300 Area	95
A-3042	Design Air Filters for Building 3706	98
A-3044	Designs for Conversion of Bldg. 3706 Offices to Labs.	95
A-3047	Nine Tube Mock Up Building	100

10.

1223531

Project Engineering - Area Reports

Status of Engineering Study & Design Work in Progress During Month of May (Cont'd)

300 Area

E. R. No.		% Engineering Complete
A-3050	Make a Design Study of Rolling Mill for 300 Area	5
A-3051	Make a Design Study of New Extrusion Press for 300 Area	10
A-3052	Prepare Recommendation for Permanent Office Space in 300 Area	80
A-3053	Prepare Project for Bldg to House Meters Group and Records	35
A-3054	Prepare Project for Frame Addition to the Existing 300 Area Garage and Grease Pit Cancelled	95
A-3055	Design Lifting Device for Timing Clocks Bldg 313	100
A-3056	Prepare Project for Bldg. 3706 Distilled Water System and Water Softener	0

700 ADMIN. & GENERAL PLANT AREAS

828	Bldg 702 - Automatic Dial Exchange	95
872-R	Improvement to Area Administration Bldgs	10
923	Improvement of Air Conditioning System Bldg 703 - Cancelled	0
925	Combined Maintenance Shops - Bldg 722	96
941	Experimental Animal Farm	52
962	115 KV Power Line Through Richland	67
972	Survey Effluent Lines 100 B & D Areas	100
973	Elec. Dist. Hdqts. Bldg. Substation 251 & Conversion of Bldg. 2713 E to Garage	28
997	Deodorizer for Building 706	5
A-401	Telephone Cable Layout - Bldg. 720	20

11.

1223532

Project Engineering - Area Reports

Status of Engineering Study & Design Work In Progress During Month of May (Cont'd)

700 ADMIN. & GENERAL PLANT AREAS

E. R. No.		% Engineering Complete
A-409	Telephone Cable Layout for Bldgs. 703, 705 760 and 770	0
A-420	Rehabilitation of Plant Railroad	24
A-428	Design & Estimate for Office Machine Repair Shop Hutment 722-H	95
A-429	Electrical Work - Bldg. 3708	85
A-432	Addition to Bldg. 760 (Trans. to Const. Div.)	100
A-438	Design for Badge Assembly Machine for Construction Security	10
A-445	Electrical Design for Bldgs. 3706, 3703, and 3707	80
A-451	Layout for Concrete Work 321 Bldg.	95
A-452	Expansion of Main Plant Telephone System	10
A-459	Lighting of Maintenance Shops Bldg. 3722	30
A-463	Electrical Drawings for Charging Device	45
A-464-R	Metering of Power - All Process Areas	5
A-467	Remodeling of Bldg. 722-A and Erection of Two Hutments for Elect. Div. (Project Cancelled - Certain Work will be done on W. O. Instead)	8
A-468	Illumination Tests - 716 Garage	0
A-469	Electrical Work - Bldg. 222U (Cancelled)	10
A-470	Seal Coating of 36 Miles of Plant Highway	95
A-471	Study of Road Improvements on Route 2 at Hanford	100
A-474	Study for Grass Seeding - 200 Areas (Deferred Pending Outcome of Stack Gas Studies	20

12.

1223533

Project Engineering Division - Area Reports

Status of Engineering Study & Design Work In Progress During Month of May (Cont'd)

700 ADMIN. & GENERAL PLANT AREAS

E. R. No.		% Engineering Complete
A-476	Electrical Work - 2705 Z Building	100
A-477	Electrical Work for Precipitator 200 Area	50
A-478	Lighting Rooms 244, 246, 2417, and 2246 - 703 Bldg.	100
A-483	Electrical Work - Buildings 271 E & W	0
A-484	Electrical Work - Building 301 Addition	0
A-485	Study for Sidewalks - 700 Area	5
A-486	Ventilation - Building 706	70
A-487	Study of Lighting - Building 703	0
A-488	Study of Lighting - Building 723 Laundry	0
A-489	Study Road Improvement Between Midway and Priest Rapids	5
A-490	Project for Columbia Camp Rehabilitation	0

1100 AREA

812	Irrigation Extensions - Village	90
840	Richland Dust Control & Landscape Program	78
896	Construction & Expansion of Parking Compounds Village (Transferred to Construction Division)	70
920	Air Conditioning All Dorms Except W-4 & W-13	100
958	Design for 5 Ton Overhead Crane - 1131 Garage Canceled	0
A-411	Oil Burner for Hospital Incinerator	15
A-412	Automatic Traffic Signsls - Richland (Transferred to Design and Construction Division	30

1223534

Project Engineering - Area Reports

Status of Engineering Study & Design Work In Progress During Month of May (Cont'd)

1100 AREAS

E. R. No.		% Engineering Complete
A-416	Patching & Seal Coating of Village Streets	100
A-426	Electric Heating - Wiring - M.S. Warehouse	25
A-453	Replacement of Roof - North Reservoir-Richland	50
A-455	Renovation of Tract House L-859	10
A-456	Improvement of Van Gieson St. Perkins Ave to Yakima River Bridge - Transferred to Design Div.	80
A-462	Alterations to 3 Drawer Fish Box - Rec. Hall	5
A-465	Fuel Oil Storage Facilities - Rich. Airport	100
A-472	Study of Improvement for Richland Airport	20
A-473	Fire Alarm Connection at Jefferson and Sacajawea Schools	0
A-491	Layout for 6 Softball Field - Richland	100

ENGINEERING STUDIES GROUP REPORT

Studies Completed This Month

E. R. No.		Date Completed
4331	J. I. Boiler Pumps and Turbines	5-20
4332	J. I. Ruggles Klingeman Valves	5-12

Studies Added this Month

4342	Analysis of Heavy Duty Lacquers	5-20

Active Studies		% Complete
4296	Oil Reclamation Survey	95
4310	J. I. Use of Abrasive Equipment	95

14.

Project Engineering Division

Active Studies - Cont'd

E. R. No.		% Complete
4318	Packing and Gasket Standards	10
4324	Lubrication Survey 200 Area	80
4326	Use of Inhibited Oil in Turbines	75
4327	Maintenance of Pitched Roofs	80
4330	J. I. Penn and Worthington Compressors	25
4333	Stainless Steel Control	75
4336	Review Oil Coding System	0
4337	Village Survey	75
4338	Tire Recapping and Repairing	10
4339	Standard Sign Catalog	25
4340	Warehouse Renovation	80
4341	Transportation Consolidation	30
4342	Analysis of Heavy Duty Lacquers	0

BACKLOG SUMMARY

	Work On Hand 4-30 Estimated Man Days	Work Completed 5-31 Estimated Man Days	Work on Hand 5-31 Estimated Man Days
Studies	124	67	233
Proj. & Design	10,833	1,525	9,845
TOTAL	10,957	1,592	10,078

1223536

ELECTRICAL DIVISION

MAY, 1948

GENERAL

Work Order Summary:

Area	Work on Hand April 25 No. of Orders	Work on Hand April 25 Estimated Man Days	Work Completed to May 23 No. of Orders	Work Completed to May 23 Estimated Man Days	Work on Hand May 23 No. of Orders	Work on Hand May 23 Estimated Man Days
100-B	7	35.0	18	182.4	19	30.2
100-D	14	72.9	13	200.9	14	103.5
100-F	15	59.4	18	366.6	3	20.8
200-E	26	117.1	21	233.8	18	73.4
200-W	47	137.0	35	305.8	30	62.2
300	32	257.4	29	369.8	32	42.8
700	28	134.1	49	255.1	27	60.7
Distribution	115	3,446.1	87	1,891.5	109	3,321.4
Telephone	18	2,817.5	14	2,242.2	24	1,237.8
Minor Const.	22	904.6	22	866.2	13	199.5
Sub-Total	324	7,980.1	306	6,914.3	289	5,152.3
Est. Project Total						2,467.6
Total						7,619.9

This work order backlog indicates a decrease for the month, but we do not consider this to be a true picture because of changes in procedure, backlog pertaining to project work had been removed from this summary so that it was necessary to add an estimated project total. Apart from this project total, the work order summary includes only outstanding work orders and does not consider routine work requests which may be open at the end of the month or which may be renewed on a monthly basis. It is intended to revise the method of summarizing the monthly work orders for next month's report. It is expected that it will show a substantial increase over the figures given above and that it will be a more realistic summary.

The attached load chart for the peak day of the month, May 3, shows a double peak of 46.7 MWH for the entire project, including non-coincidental demand of 17.7 MWH for the 66 KV system. The chart shows a slight decline as compared with the previous month but the expected seasonal decline has again been out-weighed by power demands resulting from increased construction activities.

On Project C-177, 115 KV system, the study pertaining to re-connection of Village feeders is essentially complete and prints will be ready for starting work during the month of June. It was necessary to re-route the 115 KV system in the Village in the vicinity of Lee Boulevard and Thayer Drive because the site for the new Robert Gray Junior High School was chosen in conflict with the 115 KV right-of-way. It is understood that invitations to bid have been prepared by the Construction Division, with a date of June 30 set for opening of bids for construction of the 115 KV line plus substations, foundations, etc.

1223537

Electrical Division

The lack of housing for Electrical Division personnel became critical during the month and one Assignment Engineer and five Electricians or Linemen terminated employment voluntarily mainly for this reason. Many of the personnel have been in Richland for a period of one year without obtaining Company housing and there is considerable uneasiness over this situation. An allotment of houses was obtained to assist in our most critical cases. If further allocations can be obtained the situation will be relieved, but we still consider the housing situation critical as we are slowly losing personnel because of it, and it has been almost impossible to replace such personnel by new hires because the few available men leave shortly when they realize the housing is not available.

The Electrical Standards Committee will be given recognition and will become an authorized committee. The first issue of standards is essentially complete and the mailing list has been prepared. A committee has been appointed to draft rules of procedure for the committee and it is expected that much of the work will be delegated to sub-committees, and that in the future the main committee will meet less frequently and then mainly for the purpose of reviewing and approving the work of sub-committees.

Continuing last month's report, the final Division of Responsibility between the Construction and Electrical Divisions has been approved by all interested parties and is now in force.

It was agreed that Subcontractors would be responsible for all construction and maintenance work within the 3000 Area (North Richland) and that until some later date the Electrical Division would be responsible only for the main substation up to the fused disconnects on the low tension bus.

A further agreement was reached between the Electrical Division and Construction Division (on behalf of Subcontractors) regarding division of responsibility for electrical work in the 100-DR Area. Generally, it was agreed that the Electrical Division would make all modifications inside existing buildings, the Subcontractors would do all electrical work in new buildings and that the Electrical Division would make final connections of the latter for energization.

In co-operation with the Design Division, studies were continued relative to blackout control for the new work areas, layout of 151-G and H substations, and assistance was given towards preparation of an extensive report relative to the use of copper for grounds, ground mats, and counterpoises in the work areas.

New work order procedure was studied from the departmental viewpoint and recommendations made requesting some modifications.

A study of machine tool requirements extending up to 1952 was prepared at the request of the Atomic Energy Commission.

Four Electricians were loaned to the Village Public Works Organization to assist in installing air-conditioning in dormitories, emergency basis.

Final re-installation work is being done and personnel have been assigned to the 100-B Area preparatory to re-opening.

A request for project proposal was prepared in consideration of recommendation of the Standards Committee towards operation of 440 volt system ungrounded. It is understood that the new 100-G and H Areas will operate ungrounded and the project proposal was requested for the purpose of ungrounding all existing 440 volt services.

1223538

Electrical Division

During the last three days of the month, a series of power disturbances resulted from storm conditions followed by flood. Details will be reported separately under "Transmission and Distribution" as well as the division of report pertaining to Hanford.

The review of rating sheets with the individuals concerned was completed during the month as applies to exempt personnel. The work of preparing new rating sheets for non-exempt personnel is essentially complete.

ORGANIZATION AND PERSONNEL

During the month, there were six terminations including one Assignment Engineer, two Linemen and three Electricians. See previous comments regarding housing. One Lineman, one Substation Operator, and one Helper were hired during the month, and the rate of terminations continues greater than the rate of hiring. One Substation Operator was transferred to the Electrical Division from the Power Division.

Mr. A. A. Maxwell was appointed Acting Assistant Area Engineer in the 200-E Area Electrical Division.

Number of employees on payroll:	May Exempt	May Non-Exempt
Beginning of month	41	224
End of month	40	223
Net decrease	1	1

AREA ACTIVITIES

1. 100 Areas

A. General

The subject of blackouts received considerable attention in the areas during the month. A potential trip switch for the 1700 Area feeder was installed in a locked box on the outside of the substation fence at substations C2-S5, C4-S5 and C6-S5 in 100-B, D and F to permit Patrol to trip off the area feeder in case of a request for blackout. A practice blackout was held in the 100-F Area on May 5 at 9:38 p.m. Approximately five minutes were required to attain complete blackout, which was the time allotted in the procedure. Blackout procedures are being brought up-to-date in all areas.

Severe voltage surges occurred on the night of May 26 due to heavy lightning storms throughout the eastern part of the state. Both 100-D and 100-F Area Pile units were shut down by the power failure relays at approximately 9:58 p.m. and 11:17 p.m. Critical power, Grade Y, was established at 11:23 p.m. and was released at 12:15 a.m. on May 27.

Other effects noted were as follows:

100-D Area - All electrical pumps in the 182 Reservoir Building tripped out. One process water pump motor and the "Fire and

1223539

Sanitary" pump motor in the 183 Filter Plant Building tripped off. The emergency generator in the 184 Building started up automatically on a voltage dip at 11:20 p.m. Process water pump No. 7 in Building 190 tripped off at 11:20 p.m.

100-F Area - The incoming line breaker on No. 4 cubicle in Process Water Building 190 tripped off but was immediately restored to service.

Severe lightning storms on May 27 again caused the establishment of a "Critical Power Condition, Grade Y" at 7:11 p.m. and the Pile Buildings were shut down. Critical power was released at 2:15 a.m. on May 28. Although a number of heavy surges occurred, no motors were reported as having tripped off.

During flood conditions of the Columbia River during the last few days of the month, including one crest period on May 30, no electrical equipment within 100 Area fences was endangered.

B. 100-B Area

Lines were repaired and broken pole replaced at Tract House JJ-634 resulting from high winds.

The motor and controls at Tract JJ-619 Pump Station at Vernita were disconnected for removal because of the flood conditions of the Columbia River.

Filter supply pump motors No's. 4, 5, 6, 7, and 8 in the 182 Reservoir Building were removed from temporary lay-a-way and prepared for service.

Flocculator motors No's. 8, 9, 10, 11, 12, and 13 in the 183 Filter Plant were removed from lay-a-way condition and prepared for service.

In the 185 Water Treatment Building, the following motors were taken out of lay-a-way and prepared for service:

Sodium Silicate pump motors 6, 7, 8, 9, 10
"B" acid pump motors 6, 7, 8, 9, 10
"A" acid pump motors 6, 7, 8, 9, 10
Dichromate pump motors 6, 7, 8, 9, 10

A trial installation of a "slack cable" switch was made on vertical safety rods.

Fluorescent lights were installed in rooms 1, 2, 3, 10, 11, 20 and 21 in Office Building 1704.

The necessary electrical installation was made for a large size metal planer in the Maintenance Shop, Building 1717. A variable speed motor is yet to be obtained for a milling attachment.

The Electrical Maintenance Shop was moved from the 1717 Shop Building to the 1713 Building to obtain more room and better facilities.

1223540

C. 100-D Area

On May 21, Process Pump Motor No. 4 in Process Water Building 190 shorted out during start-up. The failure was similar to the six previous failures on these Westinghouse 800 H.P. motors. The motor has been removed to the 100-D Area Electrical Shop for rewinding. It will probably be out of service for three more weeks because of a similar motor from the 100-F Area now being wound in the shop.

105-D Pile Building

(a) Design Change No. 60 covering revisions to shim rod control circuits was completed.

(b) Exhaust fan motors No. 7 and 8 in the fan room were given their annual preventive maintenance overhaul. The windings were dirty but the motors were otherwise in good condition.

(c) Two charging machine reelites on "C" elevator were replaced with heavy duty three wire type.

(d) The "A" regulating rod low speed motor failed on May 22 and was replaced by a spare. The failure was caused by the grounding of one phase group. The motor will be rewound and returned to spare parts.

(e) A film viewer was fabricated for the H. I. Division.

Three fence light poles in the 105-D Area were relocated in order to provide clearance for construction.

In order to provide clearance for addition to the 190 Building in the 100-D Area, new lines have been constructed so as to re-route the two 13.8 KV circuits, C4-L4 and C4-L5. Tentative arrangements have been made for cutting over these feeders during a scheduled "down" day on June 6.

D. 100-F Area

Project C-238 for construction of new effluent lines to 107 Retention basin is approximately 20 percent complete as regards electrical work.

On May 19 at 9:40 a.m., Process Pump Motor No. 6 in Process Water Building 190 failed during start-up. This was the sixth of these 800 H.P. motors to fail in three and one-half years. The failure was similar to previous ones and seems to be caused by the failure of the insulation between turns in a coil. The motor was sent to the 100-D Area Electrical Shop to be rewound and is about 85 percent complete.

An air cooler was installed at the Pistol Range.

105-F Pile Building

(a) The outboard bearing on No. 1 Accumulator Motor failed and was replaced during a scheduled shut down.

1223541

(b) Charging machine micro switches continue to cause trouble because of water and oil getting into them. Several switches were repaired and their condulets packed with duct-seal, taped and painted with GE-1201 red glyptal. It is hoped that this will solve the trouble.

A pole at the 105 Building was relocated to provide clearance for construction work.

Temporary 440 volt power was provided for Minor Construction at the 107 Building.

Two relay control panels were removed at Station A-4, which were checked and crated for shipment to the factory. This work was done at the request of the Design Division who have arranged for factory additions for 105-DR circuits.

E. 105-DR Area

In order to provide clearance for construction to excavate under the 230 KV line near the 151-D substation, it was necessary to string both counterpoise wires overhead temporarily.

F. Hanford

Several small services, including guard stations at ferry landings, were cut due to flood conditions.

On May 17, a construction crane tore down 7.2 KV line at the Gravel Pit in Hanford. The line was repaired and restored to service.

On May 14, a construction crane ran into the 7.2 KV line at Hanford interrupting service to the 101 Building. Fuses were replaced and service was restored.

Due to flood condition of the Columbia River, clearance over river was decreased to approximately four feet. A tug boat operating in the area came in contact with the line, burning conductor down and interrupting service to Ringold Area. At the close of the month, the line was still de-energized due to the hazard of operating with only four feet clearance above water as well as services not being disconnected in flood areas. In order to build a dike at Hanford, made necessary by flood conditions, Linemen cleared guys and other obstructions so that work could be expedited. Due to flood conditions at the Hanford substation, it was necessary to string in overhead conductors for all underground control wiring. All of this work was done on emergency 24 hour basis to prevent flooding of the substation and loss of control circuits.

Phasing between the 7.2 KV line from White Bluffs and the 7.2 KV line from Hanford was checked and found to be satisfactory for paralleling.

During line faults on the 66 KV and 7.2 KV lines fed from Hanford, the following equipment failed:

2 - 7.2 KV current transformers
1 - 66 KV potential transformer
1 - 66 KV constant current transformer

1223542

All current transformers have been repaired or replaced at this time and the potential transformer is now in the process of being rewound.

Due to the fact that cause for the above outage was uncertain, all control wire at the station has been meggered out and found to be in good operating condition with the exception of the wiring to the 66 KV current transformer which we found to have an open circuit.

2. 200 Areas

A. General

The Minor Construction Section moved into the areas during the month preparatory to 291 Building construction. In setting up their shops and equipment, considerable electrical work was required.

The protection of the stainless steel piping in the "B", "T", and "U" Areas by cathodic means is satisfactory as shown by the potential readings made between the cathode and a copper sulphate half-cell. These lines are patrolled periodically to insure that all connections are secure. The rectifiers are checked frequently and a stable current is maintained in all areas, thus providing additional assurance of the continuity of the conductors. Additional experimental work towards obtaining further knowledge of stainless steel corrosion was continued with field report to be made upon completion of the work. Eight of the rectifiers for the permanent installations were received during the month and are being installed.

B. 200-E Area

Air conditioners were installed for the 2704 Building.

The lights in the pipe gallery of the 221-B Canyon Building were raised in order to give better light in the work area of the gallery.

A "plug-in" type connector was made up for the 224-B centrifuge. This will be installed when the building conditions will permit.

There were ten motors repaired in the 200-E Area shop and three were rewound.

Sixty-five bad order poles that had been removed from the 213 Area were delivered to the Maintenance Division in the 200-E and 200-W Areas.

C. 200-W Area

Overload relays of ash pumps in the 284 Power House operated several times during the month. Load checks indicated no overload. Apparently, dash pots are defective and further investigation is being made.

On May 3, 1948, 14-1 agitator motor in the 221-T Canyon Building grounded out and caused the winding to open. The agitator was removed and a stand-by unit installed. The defective agitator was placed in Section 18 and a more detailed inspection will be made as soon as the radiation level will permit.

1223543

Electrical Division

On May 17, 1948, the supporting cable for the crane impact wrench broke allowing the wrench to fall. The trouble was caused by the cable double winding on the drum. The drum is equipped with a geared limit switch ans when this cable started to double wind, the ratio between the distance travelled and the number of revolutions was changed. By this change, the cable broke before the limit switch operated. An additional limit switch operated. An additional limit switch has been installed on the 221-T Building crane, which is activated by the cable, thus eliminating the possibility of a recurrence. Limit switches will be installed on the other cranes during the month of June.

On May 25, 1948, the area voltage in both 200-E and 200-W was lowered 5 percent. This change was accomplished by changing the taps on the transformers in the 252 substations. This change was necessary because of the boost in the Bonneville Power Administration system voltage.

In order to provide clearance for the 440 volt circuit at the 241-B Tank Farm, it was necessary to remove a transformer setting one span to the east of its present location.

Due to high winds, the anchor on dead end pole at the Power House pulled out causing 2300 volt lines to short out in the middle of spans. A new anchor was set and conductors re-sagged to prevent recurrence of above trouble.

Seventy-two bad order poles in the fence lighting circuit were replaced.

Fifty-six poles in the 13.8 KV line between Station A-8 and the 200-W Area were straightened after high winds.

3. 300 Area

In the 314 Building on May 15, an arc occurred in the reduced voltage contactor of the "A" furnace motor starter. Temporary repairs were made pending receipt of spare contactor already on order.

In the 314 Building on May 24, overload relay of generator circuit on "A" furnace jammed in open position. The furnace was out of service about two hours until the Electricians could locate and correct the trouble.

Project C-187, 321 Scale-up Tank Farm, installation is essentially complete.

Starting with the week beginning May 17, 1948, the 300 Area schedule was changed to a regular six day week, Monday through Saturday for two Electricians.

Beginning the week of May 24, 1948, the 4-12 shift was extended to a regular six day week for one Electrician. Increased activity in this area may require an additional man on the 4-12 shift and coverage on the 12-8 shift in the future.

Referring to previous month's report, Item 3-E, the substation for relief of 2200 volt transformer bank B3-S4 was completed. A substation for stepping up 440 volts to 2300 volts was constructed along side existing 440 volt substation B3-S5. Also, new primary lines were constructed and copper size was increased on existing lines to provide capacity for the additional load.

Electrical Division

This work was completed and the substation cut into service during a complete outage of the area on May 8. During the outage, extensive construction work which had not been completed, pending an outage, was finished and old lines removed in order to clear right-of-way for the construction program.

The fire alarm system to buildings in the southwest corner of the area was completed.

The 37.5 KVA transformer feeding the 3706 Building was replaced with two 50 KVA transformers connected parallel in order to provide for increased loads added in this building.

5. 700-1100 Areas

During power disturbances on the evening of May 27, the following motors tripped out due to undervoltage and over-heating. All were permitted to cool off and were returned to service satisfactorily:

1182 Consumers Pump House	No. 5 Motor
Sewage Lift Station	Small Seal Pump Motor
Sewage Lift Station	No. 2 Pump Motor
Deep Well Pump	No. 6 Motor

Lighting installation in 721 Building has been completed.

The new permanent control cables for the traffic lights at intersections of Goethals and Knight and Goethals and Mansfield were received and installed during the month.

The fire alarm circuit to the mens dormitories located at the corner of Swift and Goethals was reconstructed so as to provide proper climbing space and remove safety hazards as well as circuit hazards.

Installed primary and service to Tract House K-789.

At the request of the Construction Division, the following temporary services were provided for the MacNeil Construction Company:

Electrical Division

Provided telephone service to the McNeil Administration Building which required stringing of nine-hundred feet of fifty-pair cable.

Four-hundred and forty volt service was provided to Building 713-C for air conditioning.

At the request of the Construction Division, the 66 KV line was raised at the intersection of Wilson and Perkins Streets to provide clearance for new distribution feeder.

A new corner pole was set at the corner of Hunt and Van Giesen in order to carry additional load due to increased copper sizes.

In order to provide clearance for parking lot at Garno's Store, it was necessary to move transformer pole, telephone cable, terminal box and services to three houses to new location.

Due to widening of Thayer Drive at Duane Street, it was necessary to set two new forty-five foot poles and anchors and overhead lighting span.

It was necessary to set two new forty-five foot poles at the corner of Thayer Drive and Cullum Avenue to clear existing primary in the way of construction.

Temporary service to Chris Borg Company located at Wright and Lee Boulevard was provided, consisting of three spans of secondary and service for both power and light.

In order to provide clearance for construction of the new Robert Gray Junior High School, it was necessary to relocate the 66 KV line and pole top switch serving Station B1-S1 from the south. This work consisted of setting sixteen poles, nine anchors and guys, the stringing of nine thousand feet of 3/0 copper strand conductor and one pole top switch, also the dismantling of the old existing line approximately three thousand feet in length. In order to accomplish the above work, it was necessary to arrange a complete outage of Station B1-S1 for an eight-hour period.

Due to widening of the intersection of Thayer Drive and George Washington Way, it was necessary to construct a new two-pole transformer setting in line with existing line on George Washington Way and remove the old existing transformer setting, formerly located on Thayer Drive.

In order to clear new concrete sidewalk at Van Giesen and Johnson Street, the pole carrying the street light and fire alarm box was moved two feet to the north.

In order to provide service to three Minor Construction hutments in the northwest corner of the 300 Area, it was necessary to reconnect primary and 37.5 KVA transformer feeding this installation.

In order to clear service to new precut houses at 203 and 503 Abbott, it was necessary to set two additional thirty foot poles.

Service to Nettleton Sound Electrical Shop, Wright and Longfitt, was provided.

1223546

6. Transmission and Distribution

The following general items are of interest in addition to those reported among area report items.

Counterpoise wire on the 230 KV line was exposed at five different locations so as to allow inspection of same to determine amount of corrosion which had taken place, and which was determined to be very small.

Due to construction of the new railroad under the telephone line at May Junction, it was necessary to set six new poles in order to provide proper clearance over crossing.

In order to provide direct communication between the Hanford Works Dispatcher and the Bonneville Power Administration Dispatcher at Vancouver, Washington, it was necessary to string ten spans of new telephone circuit from the old Central Shops area to Station A-8. This work has been completed and an additional telephone is now in service.

Special labor crews continued Osmose treatment of pole butts with the following work accomplished during the month.

	Poles Treated	Bad Order Poles to be Replaced
100-D Area, 13.8 KV	77	2
Richland Distribution	697)	55
Richland Street Lighting	210)	
Total	984	57

The number of poles requiring complete replacement is in line with predictions.

The two 333 KVA 13.8/6.9 KV transformers in Substation C8-S4 feeding the Yakima Barricade and formerly feeding Central Shops and McGee Well were removed from service and replaced with a single 50 KVA transformer of the same voltage.

At the request of the Design Division, capacitors and transfer switches were installed on the carrier system for the purpose of checking the feasibility of retuning by this method. The test proved satisfactory.

Due to the low voltage condition reported in 100-B and 100-D Areas, a graphic voltage check was made on the 13.8 KV busses at Stations A-2, A-4, A-6, and A-8. The voltage was found to be approximately 2-1/2 percent below normal at A-2, A-4 and A-6 and approximately 2-1/2 percent above normal at A-8, and arrangements have been made to adjust transformer taps.

During the month, the following radio equipment work was done:

Mobile units serviced.....	89
Chassis overhauled.....	41
Stationary units serviced.....	12
Stationary chassis overhauled.....	10
Mobile units installed.....	6
Mobile units removed.....	2

1223547

Radio Station WUGN-12 at Columbia Camp was completely removed.

During the month, there were 155 transformers checked and tested, and 17 transformers were repaired and checked for the Design and Construction Divisions. Twenty-one transformers were checked and tested for Spare Parts and Electrical Distribution.

The 66 KV switch was removed from the Allard-Cold Creek line at the Yakima Barricade to be made available for the re-routing of the 66 KV line at the new Junior High School.

A study of load conditions at the Columbia Camp and estimates for the construction of a 7.2 KV line from the 300 Area or North Richland Substation is essentially complete.

Power Supply Interruptions

Date	Area	Circuit Affected	Duration	Remarks
		230 KV		
May 8	200-W	OCB C8XR	Short	51-50 Relay - Cause undetermined, probably high winds.
May 22	100-DR	C4-L57 (fuses blown)	3 hrs. 21 min.	Crane into line.
May 24	100-F	Lighting transformer	4 hrs. 5 min.	Crane into line.
May 25	200-E	Transformer (blown fuse)	17 hrs. 19 min.	Crossed secondary.
May 26	100-D,F	Critical Y	23 min.	BPA system surges due to electrical storm.
May 27	100-B	105 Area fence circuit	4 hrs. 23 min.	Open lead
May 27	100-D,F	Critical "Y" on trouble	7 hrs. 5 min.	Trouble on BPA system due to electrical storm.
		66 KV		
May 4	Col. Camp.	REA Line	Unknown	Unknown
May 4	Col. Camp	REA Line, 1-Phase	2 hrs. 32 min.	Unknown
May 4	Hanford	Hanford 6.9 KV Tertiary	1 hr. 33 min.	Fuses D5-X6 and D5-X4 blown due to crane in line.

1223548

Electrical Division

Power Supply Interruptions (Cont'd.)

Date	Area	Circuit Affected	Duration	Remarks
May 4	Hanford	Hanford-Richland 66 KV line	16 min.	Operating error
May 4	Hanford	Hanford-Yakima 66 KV line	1 hr. 35 min.	Operating error
May 7	Col. Camp	REA line	40 min.	Trouble at Prosser Substation
May 12	Col. Camp	REA line	4 min.	Unknown
May 13	Richland	Transformer at 1610 Marshall	2 hrs. 2 min.	Truck knocked down house service
May 14	Hanford	Hanford 6.9 KV line	3 hrs. 20 min.	Crane hit line
May 20	Richland	Cutouts to Transformer at 100 Craighill	23 min.	Dump truck knocked service down
May 22	Col. Camp Prosser Barricade	Columbia Camp line	35 min.	Unknown
May 25	Richland	OCB 204, Pasco	2 min.	Pasco switching error
May 26	Rivernita	Tract House JJ-6341	16 hrs. 24 min.	Pole down, fuse blown
May 27	Hanford	Hanford Substation 66 KV system, 6.9 KV lines	2 hrs. 44 min.	Walla Walla and Taunton lines out
May 27	Richland	300 Area and North Richland	30 min.	Hanford Substation out due to storm
May 27	Hanford to Taunton	Entire 66 KV system (load carried by Hanford)	2 days	Pasco Substation dead, line down (flood)
May 29	Hanford	Ringold line from D5-X8	Unknown	Line knocked down by tug
May 30	Richland	402 Rossell	3 hrs. 30 min.	Transformer burned out.

7. Telephone Group

The work necessary to provide the White Bluffs exchange with six additional trunks, total of 12, to Richland is about 50 percent complete.

1223549

Electrical Division

Work necessary to change the 101 Building telephone service to magneto service direct from the Richland exchange was approximately 50 percent complete. This change is being made to provide trunk pairs from the Richland exchange to the White Bluffs exchange.

Installation of equipment to give full appearance on positions 13 through 18 of the Richland switchboard was completed.

Cable was provided to the Atkinson and Jones Construction Company and installed by them in the "B" Housing Area.

Five telephone circuits and one teletype circuit were installed for the Nettleton Sound Company.

Fourteen telephone circuits were installed for the McNeil Construction Company.

Cable and telephone facilities were installed to the new Public Health Center.

A direct private magneto line was established between Substation 251 (Dispatchers office) and Bonneville Power Administration, Ross Substation, at Portland, also between McChord Field and the Richland Airport.

One additional foreign exchange circuit was placed in service to Portland, making a total of three to that point.

Four additional leased circuits were established to Pasco, making a total of eleven to that exchange.

Two additional toll circuits were placed in service to the Pasco exchange, making a total of thirty.

Drawings and cable were provided for the Atkinson and Jones Construction Company to place cable underground along Williams Boulevard to permit removal of overhead cable from in front of apartments at Williams and George Washington Way.

Vacant lines on the Richland switchboard as of midnight, May 27, 1948 are as follows:

Available for 1500 series	12
Available for office assignment	38
Available for residence assignment	37

Five temporary lines were placed in service to the North Richland Hospital until a PBX board is installed at this location. This PBX board is available and installation will be completed in the near future.

During the month, the following telephones were moved:

	Installed	Removed
All work areas	39	26
Richland	354	366
North Richland	212	72
White Bluffs	15	7
Total	620	471

1223550

1223551

POWER STATISTICS - ELECTRICAL DIVISION
FOR MONTH ENDING MAY 31, 1948

ITEM	ENERGY - MW HRS. April	ENERGY - MW HRS. May	MAX. DEMAND - KW April	MAX. DEMAND - KW May	LOAD FACTOR - % April	LOAD FACTOR - % May
230 KV SYSTEM						
A-2 Out (100-B)	2,720	2,760	4,900	4,800	77.1	77.3
A-4 Out (100-D)	6,630	6,810	12,200	12,400	75.5	73.8
A-6 Out (100-F	6,310	6,740	11,700	11,700	74.9	77.4
A-8 Out (200 Areas)	2,200	2,250	3,800	3,800	80.4	79.6
TOTAL OUT	17,860	18,560	32,600**	32,700**	-	-
MIDWAY IN	18,028	18,666	30,400*	30,000	82.4	83.6
Transm. Loss	168	106	-	-	-	-
Per Cent Loss	0.9	0.6	-	-	-	-
66 KV SYSTEM						
B1-S1 Out (Richland)	2,476	2,050	5,400	4,400	63.7	62.6
B1-S3 Out "	2,120	2,001	4,600	4,800	64.0	56.0
B1-S2 Out "	2,592	2,611	5,086	5,491	70.8	63.9
B3-S4 Out (300 Area)	408	250	780	816	72.6	41.2
B3-S5 Out "	316	476	1,000	1,360	43.9	47.0
B1-S4 Out (North Richland)	1,272	1,474	2,419	2,765	73.0	71.6
B7-S10 Out (White Bluffs)	105	408	855	1,080	17.1	50.8
** Hanford Out	307	300	500	500	85.3	80.6
TOTAL OUT	9,596	9,570	20,640**	21,212**	-	-
** Hanford In	4,347	5,070	9,500*	10,400*	63.6	65.5
Pasco In	5,475	4,720	14,800*	15,200*	51.4	41.7
TOTAL IN	9,822	9,790	24,300**	25,600**	56.1	51.4
Transm. Loss	226	220	-	-	-	-
Per Cent Loss	2.3	2.2	-	-	-	-
PROJECT TOTAL						
230 KV (Item 5)	17,860	18,560	32,600**	32,700**	-	-
66 KV (Item 15)	9,596	9,570	20,640**	21,212**	-	-
TOTAL OUT	27,456	28,130	53,240**	53,912**	-	-
230 KV (Item 6)	18,028	18,666	30,400*	30,000*	82.4	83.6
66 KV (Item 18)	9,822	9,790	24,300**	25,600**	56.1	51.4
TOTAL IN	27,850	28,456	48,100*	49,900*	80.4	76.6
Transm. Loss	394	326	-	-	-	-
Per Cent Loss	1.4	1.1	-	-	-	-

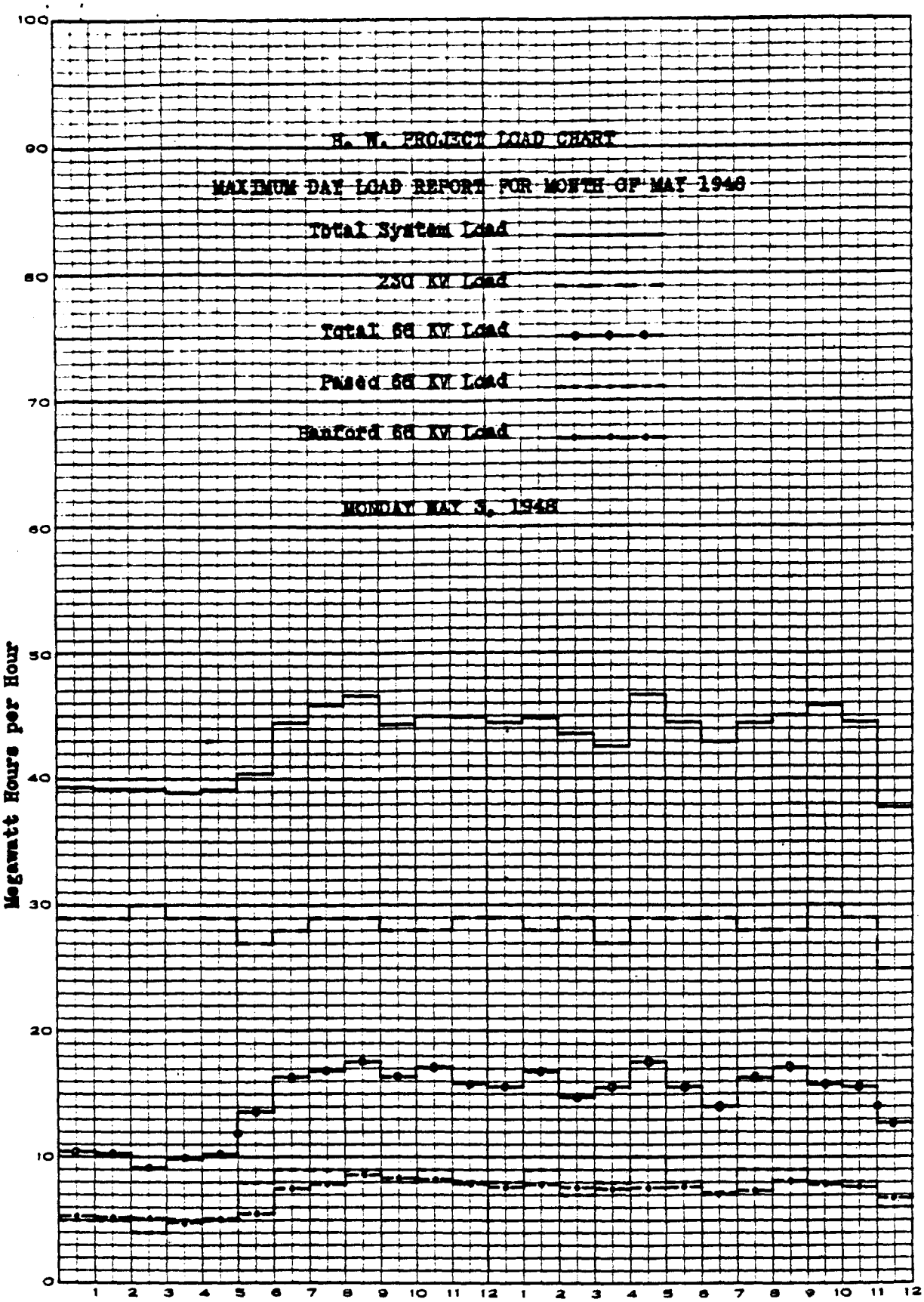
* Coincidental Demand

** Non-Coincidental Demand

Average Power Factor - 230 KV System---99.3

Average Power Factor - 66 KV System---96.1

** Hanford Readings Estimated - Meters out from May 21, 1948.


H. W. PROJECT LOAD CHART
MAXIMUM DAY LOAD REPORT FOR MONTH OF MAY 1948
Total System Load
230 KV Load
Total 66 KV Load
Pasco 66 KV Load
Hanford 66 KV Load
MONDAY MAY 3, 1948
Megawatt Hours per Hour
0
10
20
30
40
50
60
70
80
90
100
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

1223552

INSTRUMENT DIVISION

MAY 1948 June 4, 1948

GENERAL

The Instrument Division reached an agreement with the Design and Construction Divisions regarding their responsibility in the expansion program. As agreed the Division will be responsible for both design and construction activities of all instrument phases. Everyone concerned is in complete agreement with the merits of this type of operation. An organization sheet outlining this group has been issued.

Work Order Summary:

	Work on Hand May 1		Work Completed in May		Work on Hand May 31	
Area	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days
100-B	2	8.6	1	140.2	18	48.4
100-D	23	296.6	13	327.1	12	271.9
100-F	30	134.3	14	303.9	19	112.7
200-E	28	20.3	28	312.7	5	9.2
200-W	16	141.3	11	515.0	7	12.5
300	71	2703.9	51	3428.6	101	811.7
700	26	44.0	8	121.7	25	36.6
Totals	196	3349.0	126	5149.2	187	1303.0

Organization and Personnel

Number of employees on payroll:

	May
Beginning of month	197
End of month	196

Reason: One employee transferred to the Project Engineering Division.

100 AREAS (Reference Report No. HW-9967)

Status of CO_2 Addition to 100-D Gas System

System is still operating on 25% CO_2 with all likelihood of an increase to 40% in the near future. Orifice calculations have been completed and a new plate will be installed in order to adapt the present metering system to flows of higher density.

Flow indicator has been received from the Fisher-Porter Company and will be installed in the make-up system as soon as the new rotor tube is received. Efforts are under way to expedite delivery.

Instrument Division

The reactiviation of 100-B Area is progressing satisfactorily since the crew was placed on a forty-eight hour week. The overhaul and calibration of the 105 Pile Process is approximately 50% complete. The Power instruments are approximately 60% complete.

The 100-F Area received special Lucite ion chamber from the 300 Area and inserted it in tube #0353 with leads extending to test Beckman on the zero level near side. This installation was covered by Production Test #105-202-P. If results prove satisfactory under operating conditions, this chamber will be used to replace the present "A" hole galvanometer chamber and thus release "A" test hole to the Technical Division.

For the first time since August 20, 1947, an unscheduled shutdown occurred due to instrument failure. On May 22, 1948 at 3:57 A.M., the 105-F unit was "scrammed" by the No. 4 controller on the No. 1 Safety Circuit. Preliminary investigation at the time of the incident revealed that the trip point had drifted from 3.93 ($10x10^{-8}$) to 3.10 ($10x10^{-8}$). Controller was put on by-pass and left until next shutdown at which time the RXG will be removed and checked thoroughly in order to determine the fault. In this instance the unit came back up to full power at 5:02 A.M. Further investigation findings will be covered in the next monthly report.

200 AREAS (Reference Report No. HW-9968)

Installation of instruments on dissolver off-gas scrubbers has been completed in both areas. All scrubbers have had trial runs with satisfactory performance of associated instruments. In line with the stack gas decontamination program, Pitot-tube measurements of flow of discharge gas from two process tanks in Building 224-B were taken to determine capacity of proposed filters. Due to failure of filter from moisture, this study was abandoned.

Air sampling filters have been installed on the air intake of the spare thermometer wells at each fifty foot level of the Meteorology Tower. The filters are so installed that they face the T Area stack. The installation produced no noticeable effect on temperature readings.

The flow nozzle pressure taps on steam header from No. 1 boiler in 284-E Power House became plugged. The boiler shut down to install pressure taps that may be cleaned without taking the boiler out of service. During this shutdown, the flow nozzle was removed and found to be badly corroded. These nozzles are of carbon steel, no doubt war time sustitute material. The built up corrosion was removed and cleaned up as well as possible; however, it was badly pitted and rough. It was replaced and the boiler put back in service until a suitable replacement is obtained. An analysis is being made of the deposit found in the nozzle.

Project C-163 - Waste Line Thermocouples

Thermocouples have been installed at four stations on the lines from 155-TX diversion box to 241-U tank farm. Remaining stations will be installed as Minor Construction complete pipe work. Thermocouple work is approximately 30% complete.

Instrument Division

300 AREA (Reference Report No. HW-9920)

Project C-219 - Additional Health Instruments

A meeting was arranged among the Instrument Division, the A.E.C., and four possible vendors relative to the manufacture of some of the instruments on this project. The meeting was held on Wednesday, May 26, 1948 at 9:30 A.M.

Design Section

Major work completed by Design:

Preliminary prints of C. P. Juno - Health Instrument Division.
Preliminary prints of C. P. Survey Meter - Health Instrument Division.
Design of gage to measure displacement due to vibration of down comer pipe, Building 105 - Technical Division.
Design of interlocking device for connecting dummy slugs - Technical Division.
Redesign of splash tray for X-Ray spectrometer - Technical Division.
Design of filter paper holder for M.S.A. Air Sampler -- Health Instrument Division.
Redesign of Long Tom and A.C. Chambers to make sealing possible - Health Instrument Division.
Design of quick acting electrode clamp for spark stand, Spectrometer, Room 58, Building 3706 - Technical Division.
Redesign of Underwater Viewer - Technical Division.

Development Section

Development Section assignments for May include:

1. Pile Motion Indicator.
2. Mica Window G-M Tube Fatigue Study.
3. C.P. Meter Revisions and prototype Juno Survey Meter.
4. Photoelectric Position Indicator for Slug Marking.
5. Canned Slug Counting Device for 100 Areas.
6. Power Level Indicator for 100 Areas.
7. High Frequency Oscillator for Titrations.

Optical Section

About one-half of our time this month was spent on Project 171 - Revision of Crane Periscopes for 200 Areas. The project now stands as follows: Materials - all on hand; Machine Work - all completed as far as possible (some pieces will have to be removed and machined as the work progresses); Installation - 50% complete. Eye-pieces are installed in 221-T and 221-U Buildings, the quick change mechanisms are installed in 221-U Building, making a total of six completed of the twelve installations. The contamination of the canyon in both 221-T and 221-B Buildings is bad and getting worse, making it both difficult to get in and to work with the protective clothing required. With this factor in mind, it is difficult to set a completion date for the project, which was originally scheduled for June.

All three of the Fly-eye windows in the 100 Areas were replaced by Lucite of the same thickness, as a safety measure.

700 AREA (Reference Report No. HW-9969)

Central Storage of Portable Instruments

This constitutes a new service. Personnel in production areas have been given copies of a list of these instruments, and they have agreed to send in all surplus equipment. It will then be cleaned, repaired, calibrated, and stored. A list will be made and circulated of the equipment thus collected.

Tube Shop

Production Report - 9 Mica Window Tubes
39 Thin Walled Glass Tubes
12 Proportional Counters
1 Boron Coated Chamber

Automatic Plateau Runner

An adaption of the Argonne Plateau Runner (Mark 7 Model 20S) built in the 300 Area Shop has been used for checking two tubes this month. Additional work on it is still required to make the counting rate it records check with what is registered on a scaling circuit.

DESIGN AND CONSTRUCTION

100 AREAS (Reference Report No. HW-9971)

Design 100-DR Area

All design work for this area is complete with the exception of some modifications requested by the Technical Division to the B.G.S.T. Thermocouple installations. Only relocation of couples in layer 56 could be accommodated without affecting greatly shield and other design which could not be changed.

The Development Section reported that results of preliminary checks they have made on the Safety Circuit amplifiers indicate that the stability of these can be extended to cover a 15 cycle interruption. This information was passed along to the Electrical Group so that proper selection of change-over equipment from normal to emergency source of instrument power could be made without unit shutdown.

Design 100-H Area

Further discussion of 105 Building Control Room layout has led to the conclusion that improvements can be made over the first proposal. There will be considerable difficulty in installing the copper tubing pressure connections to the process tubes due to interference with elevator. This has

been discussed with construction people and a solution arrived at which will permit pre-bending of the tubing and its installation one complete row at a time. The rearrangement of equipment and panels will permit easier viewing of all instruments by the operator.

Construction 100-DR

The Brown Instrument Company requests return of the multiple point recorders to modify them to prevent their tearing the chart when printing. This can be done on the job and will be by installation of a Micro switch to disconnect the balancing motor circuit while printing.

Work of sealing up the valve racks and chamber assemblies for the water sampling rooms has begun in the Instrument Fabrication Shop.

Redox (Reference Report No. HW-9970)

Demonstration Unit

In order to make the most profitable use of available manpower, the operations personnel have been cooperating in an effort to minimize requested instrument work for the Demonstration Unit. Instrument personnel assigned to the 321 Building activities have been utilizing most of their efforts in the promotion of the Scale-Up construction program.

Scale-Up Unit

Fabrication of the flow controller panels for the column and service extraction unit feed streams has been completed and the equipment tested for functional operation. The feed stream control units, consisting of flanged pipe section, orifice differential tap piping, seal chambers and control valve are being assembled in the 321 Building Instrument Shop. These units are scheduled for installation at the completion of the process piping program.

A mock-up of the ration control system for the organic feed and aqueous effluent streams has been water tested in the instrument shop. This assembly afforded an opportunity to make preliminary adjustments for process application of the system, to check actual against indicated flow rates, and to acquaint instrument personnel with the functional characteristics of such an installation.

Redox - Kellex

The 321 Building Instrument Group conducted several experiments to evaluate methods of determining phase indication of fluids flowing in a closed pipe. Copies of the report were transmitted to the Kellex Corporation on May 6th.

1223557

Project 234-5

Sixty-four prohase requisitions have been written to date. Nineteen of these have had to be altered because of changes in process design. All but seventeen of the purchase requisitions have been placed with vendors. Delivery is promised on most of this material by July 31.

A total of eleven panel boards will be required by Process Design. Preliminary drafting has been started on eight panels. Three draftsmen are assigned full time to this work.

1223558

TRANSPORTATION DIVISION

MONTHLY REPORT

MAY 1948

GENERAL

Absenteeism in the Transportation Division for the month of May was 1.97%. This was an increase of .38% over the month of April.

Because of flood conditions, it was necessary to evacuate the Transportation Division Labor Section from the Labor Yard to the 1131 Garage area where they will continue to perform their normal functions until the flood water subsides. Approximately 1,500 man-hours were expended on flood control and evacuation work by the Transportation Division for the period May 27 through May 31, 1948.

Plant Major Injury No.47, the seventh tabulatable Major Injury in the Transportation Division since startup in May of 1944, occurred May 30, 1948, when an employee in the Labor Section sustained a fracture of the right tibia and fibula just above the ankle. The Division up to this time had established a record of 388 days or approximately 1,741,000 man-hours since the last Major Injury.

Following is the May Work Order Summary for the Mechanical and Labor Section.

Groups	Work on hand April 25 No.of Orders	Work on hand April 25 Estimated Man Days	Work Completed May 23 No.of Orders	Work Completed May 23 Estimated Man Days	Normal Work on hand May 23 No.of Orders	Normal Work on hand May 23 Estimated Man Days
All Area Labor and Repair	76	10,930.8	61	11,302.3	66	1,475.7
700-1100 and Railroad Labor	135	4,194.9	136	4,620.1	78	1,768.2
Riverland Railroad Repair	2	15.5	3	212.0	9	75.5
700-1100 Repair	63	114.1	59	2,690.0	63	187.6
Total Labor and Repair	276	15,255.3	259	18.824.4	216	3,507.0

ORGANIZATION AND PERSONNEL

Effective May 22, Transportation Division functions within the 300 Area were placed on a six day week schedule.

The total personnel of the Transportation Division was increased from 730 to 745, a net increase of 15 persons.

Force of Morrison-Knudsen, Track Maintenance Subcontractor, was increased by 57; the total force as of May 31 was 155.

OPERATIONAL ACTIVITIES

1. Railroad Operations

Railroad operations continued in a routine manner with all train movements being effected as scheduled. Commercial tonnage increased sharply as a total of 4,639 cars were handled during May compared with the somewhat below normal total of 2,976 in April. Abnormally heavy trains are being

received on week ends. For example, on Saturday May 22 two trains consisting of 131 cars were received and on Monday Morning May 24, 75 additional cars were received making prompt distribution virtually impossible.

Effective May 24, the Richland run began operating at night in order to avoid delaying the track maintenance crews presently re-laying rail east of May Junction on the day shift. This work is expected to continue throughout the month of June.

Distribution of railroad ties, rail, and other track material was made by one train crew four days each week throughout the month between May Junction and the 300-Area.

2. Repairs

Work is proceeding on the repairs to passenger coaches that are being refitted for Railroad transportation of Construction Workers.

3. Track Maintenance

Railroad track maintenance continued in a routine manner throughout the Areas by Transportation Division forces and outside the Areas by Subcontractor's forces with the following items of interest.

a. The moving of Morrison-Knudsen, Track Maintenance Subcontractor, from Benton City to Columbia Camp was completed during the month.

b. Grading for May Junction Revision was completed.

c. The Railroad Track Maintenance Subcontractor was engaged in the following work in addition to that of a more routine nature.

1) Grading of Prosser Road Revision was started on May 21 and is approximately 15% complete.

2) Track re-lay from May Junction to North Richland was started May 25.

AUTOMOTIVE OPERATIONS AND REPAIRS

1. Automotive Operations

a. Flood waters caused the closing of regular routes of travel to and from the Project making it necessary to provide other than normal modes of transportation for Project personnel on official business and official visitors. This service was performed on a 24 hour per day basis by combined forces of the Transportation Division located at Pasco and Richland, and the Richland Civil Air Patrol. The Civil Air Patrol performed an outstanding service for both the Project and general public in air transportation between locations isolated by flood conditions.

b. The extent of automotive equipment usage is indicated by the monthly total mileage of 1,225,771 for all types of vehicles.

c. Area and Village Local bus systems operated during the month as scheduled.

Effective May 1 a new bus stop was established at the 222-T Building in the 200-West Area for loading and unloading of Laboratory personnel on all shifts seven days a week.

Effective May 1 special bus service was established for nurses and firemen working at the 101 Building in Hanford.

Effective May 3 this Section began furnishing shuttle service to Construction employees from the Badge House to the Minor Construction Gate in 200-West Area.

Effective May 12 bus service to Columbia Camp was discontinued.

d. The extent of Area bus traffic is indicated by the monthly total passenger count of 104,367; the extent of Village Local bus traffic is indicated by the monthly total passenger count of 62,288.

e. Off-the-Plant special automobile trips (company business and official visitors) totaled 263.

f. Miscellaneous automotive operations services including (a) Motor Pools (b) Inter-Area Shuttle Service (c) Inter-Area Freight, Mail and Express Services (d) Towing and Wrecker Service were rendered during the month in a routine manner.

2. Repairs

A complete study and revision of maximum and minimum Store Stock requirements on automotive repair parts at the Stores Warehouse is underway. A large amount of automotive repair parts is being transferred to subcontractors substantially decreasing our inventory.

This Section received 392,511 gallons of gasoline, 146966 gallons of Diesel fuel and 5,250 gallons of kerosene during the month for Project use.

LABOR ACTIVITIES

1. Roads and Street Maintenance

Construction of parking lot at Swift and Stevens is 50% complete. Installation of blacktop around the Combined Shops is 20% complete. One hundred and ninety-one street and road signs were repaired and installed. Crushing and stockpiling of road aggregate and pre-mix road and street material required 1,211 man-hours.

2. Areas

Work in the Areas continued on a routine basis with the following items of interest.

a. 100-B

Removal of cement bricks from the 105-B Area required 560 man-hours and is now 60% complete.

b. 100-F

Project C-238 (Effluent Sewer Line 105-F - 107-F) One hundred cubic yards of concrete were poured and 11,000 cubic yards of earth were excavated for rectangular footings, gas generator and steam poles, 107-F inlet chamber, and 72" and 42" pipe trenches.

c. 200-East

Project C-112 (Additional Underground Waste Tank Facilities) Finish grading within 241-BX Tank Farm is 30% complete.

Project C-133 (Special Test Wells) Wells 361-B-9 and 10 were completed. at depths of 320 and 310 feet respectively. Wells 361-B-11, 45-69.5, 60-60, 54.5-42.5, 55-50, and 49-79 were started and have present depths of 250, 35, 45, 35, 35, and 20 feet respectively. Footage on all wells drilled to date totals 8,932.

Project C-166 (HNO3 Tank Farms for 200-East and 200-West Areas) Excavation for bases and footings at 211-B was completed. Mixing and placing of concrete at 211-B was completed.

Project C-214 (Rehabilitation of Plant Railroads) The building of the railroad cutoff at May Junction was completed, requiring 16,000 cubic yards of fill and 2,500 cubic yards of stabilizer.

d. 200-West

Project C-163 (Additional Process Waste Storage) Outlets from 221-T Building to 154-T Diversion Box is now complete to fine grade. A change in design necessitated removal of an additional 350 cubic yards of earth. Excavation from 221-U to 154-U Diversion Box is complete to plans, however soil conditions necessitate the removal of an additional 700 cubic yards of earth. Trench cutting the main line of railroad to 275-W and 284-W Buildings was backfilled and the track re-lay was completed restoring this line to service. The railroad bridge over the sewer line encasement near the Diversion Box 155 was removed, trench backfilled and track restored to service.

e. 300-Area

Concrete, excavation, and backfilling work is progressing on Projects C-220, C-227, and C-237.

f. 700-1100

Project C-138 (Automatic Dial Exchange, 702 Building) With the backfilling finished, approximately 85% of the Transportation Division's work is completed.

Project C-209 (Two Story Addition to Richland Administration Building) Transportation Division's work is completed.

Three weed spray units, designed and built by the Repairs Section, were used to spray all shoulders and runways at the Government Airport.

Well G.E. 1100-6 at Park and Davison Road was started and completed during the month at a depth of 75 feet.

g. 3000-Area

Wells G.E. 3000-A and B were completed during the month at depths of 88 and 90 feet respectively. Wells G.E. 3000-C and D were started and completed during the month at depths of 65 and 75 feet respectively.

EQUIPMENT CONTROL

1. Individually assigned passenger carrying vehicles were reviewed with each Division prior to issuing identification markers for approved overnight parking in residential areas, as required by H.W. Instructions Letter No. 82. Assignments for approved overnight parking in residential areas are limited to specific addresses for each unit so approved and only to individuals whose immediate availability in an emergency is required, or whose duties are such that freedom from the restricted schedules of other transportation is essential.

2. Thirty-three units were transferred to the Construction Division on P.I.T.'s making a grand total of 417 vehicles transferred to date.

3. There are 307 units of equipment presently on order as 37 units were requisitioned during the month. Fifty-two units were received on orders placed prior to May 1 and 21 units were received on requisitions placed during the month.

TRAFFIC SECTION

1. The Interstate Commerce Commission again placed coal cars under Service Order No.775, raising debit charges from $2.20 per day to $3.30 per day for the first two debit days and $5.50 per day thereafter, effective at 7:00 a.m. May 1, 1948. Effective May 13, 1948, at 7:00 a.m. penalty demurrage charges were further increased from $5.50 to $11.00 per day for the fourth debit day and $16.50 per day thereafter.

2. Additional temporary increase granted the railroads in interstate traffic by the Interstate Commerce Commission on May 6, 1948, was made effective on Washington intrastate traffic on May 24.

3. As a result of our request of March 12, 1948, the Interstate Commerce Commission granted the transcontinental rail carriers permission to change Hanford from a Rate Basis 2 point to a Rate Basis 3 point, in Transcontinental Freight Bureau Tariff No.40-J, effective May 17, 1948. This will reduce transcontinental rates to Hanford on several com-

1223563

modities i.e. Railway Gondola Cars, moving on their own wheels, from Chicago to Hanford - approximately $45.00 per car; and Passenger Busses from Chicago to Hanford - approximately $24.00 per car.

4. On May 11 the Greyhound Bus Lines resumed operations between Richland and Pendleton, Walla Walla, and Yakima, after being strike-bound for 71 days.

5. As a result of rate reductions secured from the carriers, there was a total savings in freight charges for the month of May amounting to $42,033.62.

TECHNICAL DIVISIONS

MAY 1948

June 1, 1948

SUMMARY

General

A major discovery was made during the month in the evaluation of the mechanism of dimensional change in uranium resulting from pile exposure. The C_o spacing evidently expands at the rate of at least 0.6% per 100 MD/ton. A meeting of metallurgists and physicists from all A.E.C. sites will be held in Richland, June 16, to discuss these developments.

Pile Technology Division

It was discovered that rolled uranium slugs which have not been heated into the beta phase shrink longitudinally and expand radially during irradiation. This demonstration of the preferential expansion of uranium crystals in one dimension has established the basic cause of slug blistering. However, the phenomenon also makes rolled, lead-dipped slugs unsuited for high exposures in the pile.

The first jacket failure in the history of the plant shut down the F Pile at month-end.

Operation of the piles at reduced power for some hours after a slightly extended shutdown was shown, by actual test, to be a desirable substitute for the use of temporary poison columns.

Use of the "Zyglo" technique for detecting hair-line cracks in Van Stone flanges gave indication that pitting of Van Stone flanges may be associated with poor bonding of the Alclad layer on process tubes.

Removal of the cork between the far side of the D Pile and the concrete wall has permitted the top rear corner of the shield to move outward a quarter of an inch.

During the month the purification process produced graphite whose quality exceeded that of any previous production. The material was of the KC type and high quality heats were produced from both the O and N fractions. The quality of CS graphite showed some slight improvement over last months low values.

A demonstration of segmented discharge using unirradiated slugs and using the reel-and-spline charger on one of the tubes in the B Pile was very satisfactory and proved the feasibility of this method for partially discharging tubes.

Separations Technology Division

Major construction on the Redox Scale-Up Unit has been completed and preliminary hydrostatic and run-in tests are under way. Certain modifications of the agitation equipment will be made and preliminary studies on nitric acid transfer

1223565

89

should get under way during June. Investigation of the anomalous mass transfer rates with different types of uranium feeds continues in the Redox Demonstration Unit, together with studies on such operating variables as feed-scrub mixing and extractant distribution methods. Laboratory studies have indicated that filter aid will be useful in clarification of feed solutions, and this will be followed up in the semi-works in connection with both filtration and centrifuging pre-treatment steps.

The Research Section continues to devote its full attention to the Redox program, with particular emphasis on the specific decontamination problems presented by certain of the fission product elements such as zirconium and ruthenium. Such problems will require an extended period of investigation, and preliminary work is concerned with developing tracer techniques and basic chemical information for these little-studied elements. Continued attention has been given to the oxidation products of hexone formed under process conditions and their effects on the behavior of other components of the system.

The Plant Assistance Group in the 200 Area has completed its work on the special Np^{237} runs carried out on highly enriched metal and has turned its attention to reduction of volumes and the consequent savings in time cycles which can be effected in standard process runs.

The stack gas disposal problem is being attacked at an accelerated pace by all of the Divisions involved. The Technical group continues to assist this program by evaluation studies of specially installed equipment and of various modifications in operating procedure. The new dissolver off-gas scrubbers have proved quite successful in reducing contamination from this source and it now appears that the dissolver operation contributes less than 2% to the total filterable activity discharged through the stacks. There has also been some decrease in filterable activity with the reduced air flow through active cells which has been accomplished through partially sealing the cell cover blocks. Further work will be needed to establish the improvement which is to be obtained in this manner. Preliminary tests on filters for the 234 Building vent lines have given poor results and attention has been shifted to scrubbers as a means for cleaning up this source of air contamination.

Metallurgy and Control Divisions

The pile test finding that alpha rolled uranium slugs canned by the lead-dip process warp severely, expand in diameter and contract in length during irradiation resulted in the decision that the triple-dip canning process should be used with this metal. It is believed that the greater dimensional stability displayed by alpha rolled, triple-dipped slugs results from the structural transformation which attends heating into the beta phase during the bronze dip. The optimum conditions for this critical dip are under intensive investigation.

Technical supervision of all uranium rolling for Hanford at Ft. Wayne, Indiana, and Lockport, New York, was continued by 300 Area Plant Assistance personnel. Finished rod quality was satisfactory.

About 6 tons of oversize rods were gamma extruded in the 300 Area and rolled to size at Lockport, New York, to yield the first significant quantity of "duplexed" uranium for pile evaluation. Various reductions and rolling temperatures were

12235bb

tried, and metallurgical study of samples is under way both here and at Schenectady while awaiting the rod shipment. It is hoped that this duplexing process will give a randomized orientation structure, which is now believed to be essential for dimensional stability in pile exposure. Work on alpha phase extrusion has been tabled.

The Statistics Group began a comprehensive study of product accountability, working in close liaison with the S Division, the Analytical Section, and the recently-appointed Accountability Representative for G.E. at Hanford.

1223567

Technical Divisions

VISITORS & BUSINESS TRIPS

D. H. Miller and C. E. Weber, of the Schenectady Research Laboratory, departed on May 1 and May 3, respectively, after assisting the Pile Engineering Section with the "beta" experiment.

Walter Rodger of the Argonne National Laboratory spent the week of May 3 here consulting with the various groups engaged in the Redox program and familiarizing himself with the development facilities and separations studies at this site.

L. B. Bragg and H. H. Race of the Research Laboratory in Schenectady visited Hanford during the week of May 17 to discuss problems associated with the design and construction of the Redox process research unit now underway at the Knolls Atomic Power Laboratory.

Professor George W. Watt of the University of Texas was here May 27 through May 29 for consultation on various phases of the research and development activities in the 200 Technical Division. It is planned to retain Professor Watt as a regular consultant on this program.

Business trips of Technical Divisions personnel during May were as follows:

R. Teats and R. D. McGreal supervised the rolling of uranium rods for Hanford at Ft. Wayne, Ind., on May 1-8. Teats and W. T. Kattner followed the rolling run made there on May 14-18. McGreal and T. S. Jones supervised the rolling done at Lockport, N.Y. on May 24-29.

H. W. Ritchey visited the Schenectady Research Laboratory on May 10-13 to conduct experimental measurements on various types of pile tube flanges (Van Stones). He returned by way of Rapid City, S.D., for interviews with Pile Technology applicants.

A. A. Johnson visited the Argonne National Laboratory, the National Carbon Company at Cleveland, and the Research Laboratory at Schenectady between May 10 and May 14 to discuss experimental programs on graphite.

P. F. Gast attended an AEC conference in Washington, D.C., on May 17.

R. J. Schier visited Simonds Saw & Steel at Lockport, N.Y. on May 17 to discuss the future alpha phase rolling program there, and to make arrangements for rolling a special group of oversize gamma extruded uranium rods to yield duplexed metal for Hanford experiments. Schier visited Battelle Memorial Institute, at Columbus, Ohio on May 18 and 19 to discuss the proposed metallurgical research program to be undertaken there on uranium.

E. P. Galbraith spent May 20 and 21 at the Electro-Metallurgical Co., Niagara Falls, N.Y., and May 24 and 25 at the Mallinckrodt Chemical Co., St. Louis, Mo., investigating methods for the analysis of uranium, with special emphasis on sampling techniques.

1223568

Technical Divisions

W. W. Marshall spent the week of May 24 at the National Bureau of Standards in Washington, D.C., investigating spectrographic techniques.

C.W.J. Wende left for Washington, D.C. on May 24 to attend an AEC conference.

ORGANIZATION & PERSONNEL

Effective May 1, the Bldg. 313 and Bldg. 314 plant assistance groups in the 300 Area were combined under R. J. Schier, Group Head.

Personnel totals in the Technical Divisions may be summarized as follows:

	April 30	May 31
100 Technical Division		
Pile Physics Section	23	24
Pile Engineering Section	14	14
	37	38
200 Technical Division		
Process Section	17	19
Development Section	85	87
Research Section	21	21
	123	127
300 Technical Division		
300 Area Plant Assistance Group	9	10
Metallurgy Laboratory Section	16	17
Analytical Section	367	370
Statistics Group	10	10
Information Group	14	15
	416	422
Administration	11	9
	587	596

The increase of 9 in total personnel resulted from net additions of 5 and 4 to the monthly and weekly rolls, respectively.

New hires were as follows: 200 Development added one chemical engineer and one chemist. One metallurgist was employed for the Metallurgy Laboratory. The Analytical Section added three non-exempt chemists, four laboratorians and two analysts. Terminations and miscellaneous transfers accounted for the rest of the changes in personnel. Most of these occurred in the weekly roll, although 200 Process added two chemists by transfer (one from Analytical and one from 200 Development), and lost a chemical engineer by transfer to Schenectady (KAPL). One engineer terminated from 200 Development to enter private business.

At month-end there were 2 exempt and 31 non-exempt personnel on the Technical rolls awaiting security clearances for classified work. Most of the latter were laboratorians in the Analytical Section.

1223569

Technical Divisions

200 AREAS PLANT ASSISTANCE

Canyon Buildings

Nine Class "C" material runs (approximately 400 g/t) were processed at B Plant. The average extraction waste loss for these runs (B-8-05-F-5 through D-13) was 0.98%. The average loss for normal material processed during April was 0.45%. The gamma activity of the Class "C" metal solution was approximately 10% lower than that of recent runs. The extraction waste of eight of these runs was processed for recovery of Np^{237}. The neptunium extraction cake solution was stored until the high g/t material had proceeded through extraction and an acid wash run had been made. Sufficient sodium bismuthate was used for the first cycle by-product precipitation in the Np^{237} recovery runs to destroy the oxalic acid carried with the extraction precipitates. A procedure of double oxidation was found to result in lower losses for this precipitation.

The acid wash of the Canyon equipment, made in preparation for the Np^{237} recovery runs, was centrifuged with agitation in the first cycle by-product precipitation to eliminate the recycle of the wash water into the run following. A large amount of bismuth was picked up from the precipitator tank by this run and difficulties were experienced in removing the by-product cake from the centrifuge. An additional acid flush of the precipitator tank and centrifuge was made following the acid wash run. The product loss in the by-product waste of the acid wash was 0.21% of a normal run and 1.59% was picked up by the second acid flush. The waste was not reworked due to the large amount of bismuth present. It is believed that the high bismuth and product pick-up is a result of incomplete transfer of the precipitate from the precipitator to the centrifuge during normal operation. Further investigation is planned following the Np^{237} recovery runs.

Due to the high product pick-up of Run B-8-05-D-13A, and AW-1, approximately 25% and 10% of a standard run, respectively, the second cycle product precipitator tank spray was inspected and found to be broken. Following replacement of the spray, a second acid wash of the precipitator tank was made. Approximately 3% of a standard run was recovered.

The precipitator tank agitator failed at T Plant during the extraction precipitation of Run T-8-05-F-13. The process was completed with air sparging for agitation with the result that only approximately 32% of the run was transferred to the cake solution tank. The metal waste contained 0.77%. The remainder of the run was recovered from the precipitator after the agitator was replaced. The final waste loss was 0.36%.

Run T-8-04-D-18 was processed through the first and second decontamination cycles of the Canyon Building and through the Concentration Building under Production Test 221-T-13 with process volumes adjusted to 90% of those used in recent runs. Losses and decontamination were normal. A ten run series under this Production Test was started with Run T-8-05-F-14.

Concentration Buildings

Replacement of the 20 gpm jet with one of a 10 gpm rating corrected difficulties encountered at T Plant in transferring the chemical run lanthanum fluoride product cake from the B Cell centrifuge to the metathesis tank. Run T-8-04-D-19

1223570

was processed through B Cell (the first at T Plant in the program of alternate use of B and E Cells for the lanthanum fluoride product precipitation). The operation and losses were normal.

Investigation of the lanthanum fluoride product precipitation losses in B Cell at B Plant has revealed that excessive product solution heels are left in the precipitator tank following each centrifugation. It is planned to lower the dip tube of the transfer line from this tank. This should bring B Cell losses closer to the level of E Cell losses.

The lanthanum fluoride by-product wastes of two runs are being combined for reworking. This started with Run T-8-05-D-5. Losses have been unaffected.

Isolation Building

Essentially no first cycle peroxide precipitate was obtained in processing Run T-8-04-D-17. Approximately 38% of the run remained in solution after repeating the reduction and precipitation. No cause for the difficulty was found.

A leak in the AT Tank of Cell 3 allowed the major part of Run B-8-05-F-4 to drain to the Cell floor. The greater portion of the product was recovered from the hood sump in a small volume and reprocessed. The balance of the run was recovered by flushing the hood floor and sump and recycling to the Concentration Building.

REDOX DEVELOPMENT

Demonstration Apparatus

During the month, Demonstration Unit investigations have continued to be directed toward clarifying the recently reported uranium mass transfer anomalies that indicate a variation of column efficiency with feed source. Previous studies in the 2-inch IA Column have revealed a pronounced increase in uranium H.E.T.S. (up to 2 - 3 ft.) when IAF feeds are prepared from uranium nitrate salt, uranium trioxide or uranium recovered from process by a IC stripping and concentration. Such behavior may be explained, at least in part, by the presence of a component in the conventional dissolver metal feed which either improves the rate of solute diffusion or conditions the Fenske packing in a manner conducive to good uranium transfer.

In an attempt to isolate the source of such a component, studies have been conducted in the 1-, 2-, and 3-inch IA Columns to determine any difference in column efficiency when uncanned uranium feeds are employed.

Four runs in the 2-inch IA Column produced the following results at 55% of flow sheet throughputs.

1223571

DEMONSTRATION UNIT - 2-INCH IA COLUMN

Run No.	Duration, Hrs.	Feed Source (slugs) (1)	Waste Losses, % of Feed U	Uranium H.E.T.S., Ft.(Extrac. Sec.)
18	48	uncanned	10.5	2.9
19	50	(20% canned 80% uncanned)	10.4	2.7
20	68	canned	0.13	0.93
21	80	canned	11.0	2.9

(1) Slugs canned by bronze-tin-alsi method.

Previous studies in employing canned uranium feeds have repeatedly produced uranium H.E.T.S. values of about 0.8 to 1.0 ft. in the 2-inch IA Column. The last run listed above destroys the pattern of behavior existing up to that time. There appears to be no adequate explanation for these high uranium waste losses. Approximately 10 days prevailed between Runs 20 and 21, during which time, the column was filled with IAS scrub containing small amounts of residual chromium. This solution might possibly affect the surface characteristics of the packing. Studies are planned to clarify this point by scheduling runs with no interim stand-by period and by varying the down time of the column.

A 65-hour simple-column (no scrub section) H.E.T.S. run (3"-5-U) has been completed in the 3-inch IA Demonstration Unit column at 55% of flow sheet throughputs. Pre-mixed IAF (canned uranium slugs) and IAS were introduced above the extraction section. Previous high uranium waste losses (ca. 25%) were believed to be due, at least in part, to inadequate mixing of the feed and scrub streams. Partial improvement was evident by a decrease in waste losses from 25% to 15% of feed uranium after 25 hours of operation. A uranium H.E.T.S. value of 3.4 ft. was obtained as compared to about 4 - 5 ft. when extraction is carried out in a compound column. An 8-hole (3/15" i.d.) inverted nozzle was employed for solvent (IAX) introduction below the spiral watch-spring packing support. Channeling of solvent was observed at this point. Studies are planned to improve this distribution by means of a conical Elgin-type distributor containing 66 inlet nozzles each 0.04 in i.d.

The apparent dependence of uranium mass transfer on feed source has been studied further in the 1-inch IA Column. Two 65-hour runs were completed during the month with feeds prepared from uncanned uranium. The results at 55% of flow sheet throughputs are listed below, together with data for early runs.

DEMONSTRATION UNIT - 1-INCH IA COLUMN

Run No.	Duration, Hrs.	Feed Source (slugs)	Waste Losses, % of Feed U	Uranium H.E.T.S. Ft.(Extrac. Sec.)
1"-6-U	46	canned	0.08	0.69
1"-7-U	46	uncanned	0.07	0.64
1"-8-U	65	uncanned	0.5	0.77
1"-9-U	65	uncanned	0.5	0.80

1223572

Prolonged operation with uncanned feeds was believed necessary to detect any differences in mass transfer. No obvious reason presents itself for production of marked mass transfer differences in the case of the 2-inch column versus only slight differences for the 1-inch column.

During the month five ICU concentrations were conducted without incident. Five IC recovery runs were completed in the 5-inch stainless steel column packed with 10.5 ft. of 1/4-inch split stainless steel raschig rings. In all cases, operation was steady and ICW waste compositions averaged less than 0.1 g/l. of uranium. The recently installed sodium uranate precipitation process for the recovery of uranium from high IAW waste has functioned satisfactorily. To date, about 500 pounds of uranium metal have been recovered. Arrangements are being made for disposing of the centrifuged precipitate along with the P Division Type "C" rework material.

During the month, the 3-inch Column enclosure has been modified to allow the insertion of an enlarged (4-inch) feed mixing Tee and a conical Elgin-type IAX distributor. Auxiliary head tanks, about 6 ft. in length and composed of 4-inch Pyrex pipe have been installed for the purpose of securing more accurate measurements of flow rates.

Equipment Development

The 155 sq. in. Type G (0.0004" porosity) sintered stainless steel filters now employed to process Demonstration Unit IAF feeds allow an initial flow of about 0.7 gal./min./ft.^{2} at a pressure drop of 20 p.s.i. During passage of approximately 75 - 100 gallon of feed, the rate decreases to about 0.2 gal./min./ft.^{2}. Backwashing with water at 20 p.s.i. pressure drop restores the filter capacity to its original value. While little improvement has been noted in solution clarity as measured photometrically, the large troublesome foreign particles have been removed and negligible crud accumulation has been evident in the Demonstration Unit IA columns. Studies in the experimental filtration test stand have indicated that the amorphous nature of the foreign particles causes rapid plugging. Greater filter capacity and improved clarification may require the use of inert filter aids. The equipment is now undergoing modification for this purpose and some filter aids have been evaluated in the laboratory.

Studies in the 1-inch, 3-stage UNH Horizontal Extractor have been directed toward further clarifying effects of mechanical and operational variables on extraction efficiency. The following points are worthy of note.

1. At total phase throughputs of 200 ml./min., agitator speeds of 1600 Rpm, uranium stage efficiencies decrease from 100% to 86% when the organic/aqueous flow ratio is increased from 1.0 to 2.0.

2. At agitator speeds of 1600 Rpm and organic/aqueous flow ratios of 1.4, uranium stage efficiencies decrease from 90.6% to 74.6% when the total throughput is decreased from 435 to 100 ml./min.

During the month, the G.E. Turbine pump was dismantled and all parts dimensioned, weighed, and photographed. Excessive shaft and bearing wear necessitated refabrication and replacement of these parts. A prolonged life test is now in progress employing water as the test fluid. Redox Equipment Testing Report

1223573

No. 2 (Document HW-9694) dealing with head vs. capacity characteristics of the pump was issued May 5.

The equipment for the dynamic corrosion testing program has been fabricated and assembled. Solution make-up is now in progress and testing is contemplated in the near future.

Scale-Up Studies

Canyon tank farm construction was virtually completed during the month and leak testing under hydrostatic pressure started. Equipment flushing and calibration is scheduled for 24 hour operation approximately June 1, and will be accompanied by three-shift maintenance coverage. An excessvie number of leaks have been encountered in the trench header piping and in transfer pump discharge piping due principally to flange warping. Preliminary tests with three tank farm agitators have revealed unstable operation leading to excessive shaft whip and bearing freeze under load. Arrangements are being made to consult with the manufacturers regarding possible design modifications. The Morrison-Knudsen personnel completed their work on the tank farm May 28. All remaining work will be completed by works maintenance. The NH_4NO_3 storage building is complete and the first shipment of NH_4NO_3 from the Umatilla Ordnance Depot will take place within the next two weeks. The waste disposal crib area is complete except for an exclusion fence and some of the unloading spot piping. All 1/2-inch Raschig ring packing has been degreased and ready for installation when flushing is complete.

Process Laboratory

Laboratory studies during the month have been devoted to (1) the securing of final equilibrium data for the IA, IC, and ID uranium systems with both NH_4NO_3 and $Al(NO_3)_3$ salting agents and (2) the procurement of preliminary information concerning IAF clarity improvement obtainable with filter aids such as Johns-Manville Super Cel, Whatman Co. paper accelerator, Alcoa A-5 alumina, and charcoal. Photometric clarity is increased from about 60% to 90% transmission following one pass through these materials. With the exception of the "paper accelerator", the filter aids perform equally well as centrifugation scavengers.

REDOX RESEARCH

Zirconium Investigations

Carrier-free zirconium tracer solutions have been prepared by separating zirconium from 8-1-MR solutions with glass wool followed by purification with a single TTA extraction cycle. The final solution from TTA extraction shows a β to α counting ratio of the order of 1.3×10^5, indicating low product contamination of the zirconium tracer solution.

Adsorption of carrier-free zirconium tracer by glass wool from HNO_3 solutions containing no salting agent appears to reach a maximum of about 85% at about 0.3 M HNO_3, decreasing rapidly as the acidity is increased and somewhat more slowly as the acidity is decreased. Over the HNO_3 range of 6.67 to 0.3 M the H^+ dependence of the adsorption indicates a difference of two hydroxyl groups

between the adsorbed and non-adsorbed species. At HNO_3 concentrations of 0.67 M and above and with 4 M NH_4NO_3 present the distribution ratio (aq./hex.) of Zr is increased by a previous contact with glass wool.

Ruthenium Investigations

The absorption spectra of commercial ruthenium chloride in HNO_3 and HCl solutions treated with various oxidizing and reducing agents have been studied. In general, the solutions showed continuous absorption over the visible range with a noticeable lack of definite, characteristic peaks.

The oxidation of ruthenium to a volatile tetroxide, RuO_4, can be accomplished with potassium dichromate in the presence of 5 N H_2SO_4 but is slower than with permanganate. The tetroxide is reduced readily to a black, insoluble material in two-phase mixtures containing 6 N NaOH solution and ethyl alcohol or mesityl oxide but less rapidly in mixtures containing hexone or methyl isobutyl carbinol.

UNH has been found to moderately increase the distribution of ruthenium into the hexone phase. This effect is small for the lower valence states of ruthenium but is appreciable in the presence of dichromate.

Techniques for mounting aqueous ruthenium tracer samples on one inch watch glasses have been investigated. No difficulties were encountered in mounting samples of nitric acid solutions. In the presence of dichromate, however, reducing agents are necessary to prevent loss of activity through volatilization. Alcoholic NaOH has proven unsatisfactory. Erratic counts were obtained with saturated SO_2 water. Good results were attained, however, with hydroxylamine hydrochloride.

Semi-Works Feed Solution Problem

The specific rate of transfer of UNH from an aqueous to a hexone phase has been measured by two methods, one where hexone is the continuous phase and another where the aqueous phase is continuous. No differences were observed between IAF solutions prepared from UO_3 and from jacketed slugs by either method.

Hexone-water Azeotrope Compositions

The temperature and composition of hexone-water azeotropes as a function of pressure has been determined at pressures ranging from 27 to 752 mm. At 27 mm. and a temperature of 19.8°C the azeotrope was 81.2% hexone by weight; at 752 mm. and a temperature of 87.5°C the azeotrope was 76.2% hexone by weight.

Oxidation Products of Hexone

The nitrous acid catalyzed oxidation of hexone to methylisopropyldiketone by HNO_3 is found to occur at room temperature when 0.1 M $NaNO_2$ is added. Extraction with or steam distillation from strong KOH solution separates most of the diketone from the unreacted hexone.

Effect of Methylisopropyldiketone on the Distribution Ratios of Zr(IV) and Pu(VI)

Using 1% of the diketone in hexone, no effect on the distribution ratios of Zr(IV) and Pu(VI) in simulated process systems was noted.

STACK GAS DISPOSAL

Packed columns, designed to scrub dissolver off-gas with water, have been installed and operated with the dissolvers in use at both B and T Plants. Filtration tests on dissolver off-gas, made at B Plant during three complete dissolving cuts with the water scrubber in operation, indicated efficient decontamination of these gases and the elimination of peak activity periods. Operating data indicated that approximately 50% of the nitrogen oxides were scrubbed from the off-gases. It is estimated from these data that less than 10% of the filterable stack gas activity during dissolving is due to dissolver off-gas while the scrubbers are in operation; on a 24 hour basis, less than 2% of the total filterable stack gas activity is thus contributed by the dissolver. Reliable comparable data for conditions before installation of the scrubbers do not exist. Efforts to get such information by filtering the off-gas during a dissolving period resulted in a filter canister which was too radioactive to open; decay measurements indicated that much of the activity was iodine, however.

Routine filtration tests on Canyon ventilation air at T Plant confirm the decrease in filterable activity previously observed to be coincident with the reduction of air flow through the pipe trench and cells used for radioactive processes. Pressure drop readings across the fans indicated that total air flow was virtually unaffected by sealing the covers of these cells and of the pipe trench. Extra air was apparently drawn through the cells which were not sealed. Plugs have been installed in the sewer drains of the cells not in operation. During the latter part of May a few tests at T Plant indicated the activity in Canyon ventilation air to be increasing. The remainder of the cells in the Canyon Building were sealed and the air flow through the Concentration Building tanks was reduced. No data evaluating these measures are available at this time. No particles have been collected in these tests, however, since the air flow through the active cells was reduced. Activity in the Canyon ventilation air at B Plant has been essentially constant when the nature of operations in the Canyon are comparable. The number of particles collected at B Plant has decreased.

The CWS Type 6 filters, recently installed between the Canyon Building cells and the ventilation tunnel were replaced in certain selected cells. A decrease in filterable activity was observed following the replacements; however, due to curtailed Canyon operation during the test period and a later increase in activity, the efficiency of these filters for stopping large amounts of entrained activity is questionable. The decrease in the number of particles collected at B Plant, however, may be due to these filters.

A CWS Type 6 paper filter was installed in the E Cell (lanthanum fluoride product precipitation) centrifuge and catch tank vent system of the Concentration Building at B Plant. Excessive condensation caused rapid failure of the filter and gross alpha contamination of the filter unit area. Since the filtration of the vent air was found to be unsatisfactory, a scrubber was designed for this service. One unit has been fabricated and is being installed in the same vent system. Tests to evaluate the performance of this scrubber are planned.

The black iron ductwork associated with the No. 3 fan (steam stand-by) unit has been replaced with stainless steel at both plants. This completes the program of duct replacement.

1223576

Technical Divisions

PILE PHYSICS

Graphite Quality

The quality of regular production purified graphite increased during the month. The average dih of the heats tested was 0.939 as compared with the previous high of 0.859 obtained in April. One heat, KCNF-91, had a dih of 1.05, the highest measured to date. It is noteworthy that this heat was prepared from "N" or low quality material. Occasionally heats of purified graphite of low quality are found. These come with about equal frequency from N or O material. Chemical analyses of selected bars from the heats and of resistor carbons included in the purification furnace indicate that high boron content is responsible for the low quality.

Results of a series of experimental purification runs indicate that in the present process both chlorine and freon are essential for the production of high quality graphite. The results were inconclusive on the relative merits of helium and nitrogen as flushing gases.

The quality of CS material tested during the month was low but represented a slight improvement over April. A chemical analysis indicated that increases in boron and vanadium impurities account for approximately equal portions of the decrease in quality from former levels for CS material.

The purity and density of the few KC heats tested during the month were normal.

Graphite Monitoring - Production Test 105-1-P

The X-ray spectrometer has been assembled and calibrated. Measurements were made of the expansion of the a_3 dimension in a series of samples of various exposures. These measurements confirmed previous work at Chicago and Schenectady except where the previous values departed from a smooth curve. For capsule exposures the expansion is linear with exposure up to the highest exposure measured, 1200 MD/CT.

A direct comparison of results on two samples indicates greater annealing of stored energy in the carbon dioxide filled process tube than is achieved at identical temperatures in the laboratory. A thermocouple installed in the process tube indicated a temperature of 254°C. A sample exposed 1182 MD/CT in a test hole and then exposed in the process tube, released no energy below 400°C in the Sykes test and showed considerable annealing of the energy at 475°C. The second sample, exposed 1127 MD/CT in a test hole, and then annealed at 250°C in the laboratory had a normal Sykes curve, with energy release beginning at 330°C and no apparent annealing of the energy released at 475°C.

Pile Control

An opportunity occurred for testing a recently devised procedure for staring up after a slightly extended shutdown. The pile was down for 27-1/2 hours and would have required the use of temporary P columns according to standard start-up procedure. Instead, the power was held at 125 MW for 13 hours after start-up and then raised to full operating level. This produces two reactivity peaks of reduced size compared to the single peak which would be encountered under normal start-up methods. The test was successful; the observed reactivity

1223577

peaks agreed with predictions.

Lithium hydride is being considered as a material for use as a combination moderator and absorber in the safety rods of future piles. Samples of this material, exposed in the pile, indicate that the induced radioactivity will be of the same magnitude as that in the present rods.

Reactivity Coefficients - Production Test 105-188-P

Tests performed in April have been analysed. The reactivity coefficients of the F Pile were found to be in agreement with the trend indicated by previous measurements. At the D Pile, the expected increase of the graphite coefficient, due to the carbon dioxide in the pile atmosphere, was not found. The D Pile test will be repeated at the earliest opportunity, to determine the statistical reliability of the results.

Shielding Studies

In order to clear a test hole for shielding studies, the Instrument Development Section was requested to design a neutron sensitive ion chamber which could be used in an empty fringe tube and which would be an acceptable substitute for the chambers presently located in the large test holes. An experimental chamber functioned well in preliminary tests and further testing is in progress.

General

An agreement was reached with representatives of the Design Division for the relocation of the graphite thermocouples in the DR Pile. The new locations were selected so as to give a better picture of the graphite temperatures in the region of the pile which is important from a reactivity standpoint. A similar relocation proposal is being prepared for the H Pile.

Reactivity

At month-end, the reactivity status of the two operating piles was as follows:

	D Pile	F Pile
In rods	63 inhours	70 inhours
In Special Requests		
within poison pattern	147	95
outside poison pattern	18	5
In Plant Assistance irradiations	20	0
In lead-cadmium columns	0	0
In bismuth columns	150	156
In dummy columns		
(including empty fringe tubes)	23	39
In xenon	512	524
In over-all coefficient	- 135	- 118
Total cold, clean reactivity	798	771

The F Pile gained 12 inhours during the month; the D Pile was unchanged.

1223578

Technical Divisions

Status of Special Irradiations

The status of the Special Request program on May 31 is given below. Those items which were active during the month are marked with an asterisk. Items listed as completed last month will receive no further mention. The number under P. T. indicates the Production Test, series 105-P. The letter suffix after a tube denotes the pile. Under "Quantity" the number of pieces, if given, will indicate that the material has been received. Under "Tube and Pile" the initials BTFD, BTHF, DTHF mean the piece is charged into the "B" test hole at the D or F Pile or into the "D" test hole at the F Pile. The suffix T will denote a tentative schedule which may be changed. The abbreviations ORNL and ANL after the request number refer to Oak Ridge National Laboratories and Argonne National Laboratories respectively; KAPL refers to the Knolls Atomic Power Laboratory, UCRL refers to the Radiation Laboratories at the University of California.

	Req. No. & Source	Material	Quantity	Exposure	Charged	Tube& Pile	Dis-charged	Shipped	P.T.	ih ab-sorbed
	3-3(ORNL)	Thorium	24 pcs.	120 da.	7/2/47	2082F	12/2/47	6/2/48T	49F	
			24 pcs.	120 da.	7/2/47	1579F	12/2/47	6/2/48T	49F	
			16 pcs.	120 da.	8/5/47	2066D	1/6/48	6/2/48T	49F	
			20 pcs.	120 da.	8/10/47	3274F	1/11/48	6/2/48T	49F	
			22 pcs.	120 da.	9/2/47	2666D	1/6/48	6/2/48T	49F	
			27 pcs.	120 da.	9/2/47	2682D	1/6/48	6/2/48T	49F	
			32 pcs.	120 da.	9/16/47	3179D	2/16/48	6/2/48T	49F	
			27 pcs.	120 da.	9/9/47	2082D	2/3/48	6/2/48T	49F	
			18 pcs.	120 da.	10/21/47	1579D	3/2/48	6/2/48T	49F	
			18 pcs.	120 da.	10/21/47	3274D	11/18/47	6/2/48T	49F	
*			20 pcs.	120 da.	12/2/47	2082F	5/12/48	--	49F	
*			20 pcs.	120 da.	12/2/47	1579F	5/12/48	--	49F	
*			18 pcs.	120 da.	12/3/47	3274D	5/4/48	--	49F	
			11 pcs.	120 da.	1/8/48	2066D	6/6/48T	--	49F	15
			11 pcs.	120 da.	1/8/48	2666D	6/6/48T	--	49F	15
			27 pcs.	120 da.	1/8/48	2682D	6/6/48T	--	49F	25
			16 pcs.	120 da.	1/8/48	3169D	6/6/48T	--	49F	17
			13 pcs.	120 da.	3/2/48	1579D	--	--	49F	15
	*12-B(UCRL)Pu^{239}		1 slug	1 yr.	5/25/48	1769D	--	--	200	5**

(Req. 12-B was previously irradiated for fifteen months. After its discharge (July 15, 1947) it has been allowed to decay until such time as it could be recharged. A special lead cask was fabricated for this recharging.)

** Tube 1769D also contains 1 pc. SR-54, 4 pcs. SR-63, UCRL-100-105, 1 pc. SR ANL-111, and 2 cobalt slugs.

	13-4(ORNL)Be_3N_2		35 pcs.	6 mo.	2/12/47	1474F	8/10/47	6/2/48T	70C	
	13-5(ORNL)Be_3N_2		38 pcs.	6 mo.	9/9/47	3169D	11/18/47	6/2/48T	70D	
*			30 pcs.	6 mo.	11/4/47	2374F	5/12/48	--		
*			30 pcs.	6 mo.	11/4/47	1569F	5/12/48	--		
			19 pcs.	6 mo.	2/2/48	1569D	--	--		12
			19 pcs.	6 mo.	1/18/48	2374D	--	--		12
*			53 pcs.	6 mo.	5/12/48	2374F	--	--		21
*			53 pcs.	6 mo.	5/12/48	1569F	--	--		21

1223579

Technical Divisions

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube& Pile	Discharged	Shipped	P.T.	ih absorbed
15-15(ANL)	LiF	19 pcs.	3-4 wks.	12/24/47	1569D	2/3/48	6/2/48T	55F	
		23 pcs.	3-4 wks.	12/24/47	2374D	1/18/48	6/2/48T		
		8 pcs.	3-4 wks.	12/23/47	3179F	1/27/48	6/2/48T		
		18 pcs.	3-4 wks.	12/2/47	3169F	1/27/48	6/2/48T		
		8 pcs.	3-4 wks.	12/23/47	2682F	1/27/48	6/2/48T		
		11 pcs.	3-4 wks.	1/27/48	3179F	2/24/48	6/2/48T		
		11 pcs.	3-4 wks.	1/27/48	3169F	2/24/48	6/2/48T		
		11 pcs.	3-4 wks.	1/27/48	2682F	2/24/48	6/2/48T		
		15 pcs.	3-4 wks.	2/3/48	2082D	3/2/48	6/2/48T		
		11 pcs.	3-4 wks.	2/24/48	2682F	3/24/48	6/2/48T		
		8 pcs.	3-4 wks.	2/24/48	3169F	3/24/48	6/2/48T		
15-16(ANL)	LiF	3 pcs.	3-4 wks.	2/24/48	3169F	3/24/48	6/2/48T	55F	
		11 pcs.	3-4 wks.	2/24/48	3179F	3/24/48	6/2/48T		
		15 pcs.	3-4 wks.	3/2/48	2082D	4/4/48	6/2/48T		
		11 pcs.	3-4 wks.	3/24/48	3179F	4/11/48	6/2/48T		
		11 pcs.	3-4 wks.	3/24/48	3169F	4/11/48	6/2/48T		
		11 pcs.	3-4 wks.	3/24/48	2682F	4/11/48	6/2/48T		
		18 pcs.	3-4 wks.	3/19/48	3179D	4/11/48	6/2/48T		
*		11 pcs.	3-4 wks.	4/11/48	3179F	5/12/48	--		
*		11 pcs.	3-4 wks.	4/11/48	3169F	5/12/48	--		
*		11 pcs.	3-4 wks.	4/11/48	2682F	5/12/48	--		
*		18 pcs.	3-4 wks.	4/11/48	3179D	5/10/48	--		
*		15 pcs.	3-4 wks.	5/4/48	3274D	6/6/48T	--		18
*		11 pcs.	3-4 wks.	5/12/48	3179F	6/6/48T	--		16
*		11 pcs.	3-4 wks.	5/12/48	3169F	6/6/48T	--		16
*		17 pcs.	3-4 wks.	5/12/48	1579F	6/6/48T	--		21
*		15 pcs.	3-4 wks.	5/10/48	3179D	6/6/48T	--		18
*28-2(ORNL)	Iron	1 casing	2 mos.	2/16/48	BTHD	4/27/48	5/3/48	87B	
28-3(ORNL)	Iron	1 casing	2 mos.	4/27/48	BTHD	--	--	87B	0
28-4(ORNL)	Iron	1 casing	2 mos.	--	--	--	--	87B	
28-5(ORNL)	Iron Enriched	1 casing	Indef.	4/4/48	BTHD	-	--	87C	0
28-6(ORNL)	Iron Enriched	1 casing	6 mos.	4/4/48	BTHD	-	--	87C	0
29-5-10(ORNL)	P_2O_5	6 casings	60 da.	--	--	--	--	96B	
*40-Prelim.(KAPL)	Pu	2 slugs	1 wk.	3/19/48	1474D	4/4/48	5/3/48	14B	
*40-3(KAPL)	Pu	3 slugs	2 mos.	1/18/48	2881D	3/19/48	#2) #6; 4/14/48 #5) 5/3/48	14B	
*40-4(KAPL)	Pu	3 slugs	4 mos.	1/18/48	3177D	5/25/48	--	14B	

1223580

Technical Divisions

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
*40-5(KAPL)	Pu	3 slugs	4 mos.	5/25/48	3177D	--	--	148	5
*43(ORNL)	Stainless steel & monel	1 papoose	3 mos.	12/23/47	2666F	4/4/48	5/3/48	111	
*45(ORNL)	Gold	4 slugs	90 da.	12/23/47	2666F	4/4/48	5/3/48	131	
*46(ANL)	Bi^{209}	1 papoose	4 mo.	12/23/47	2271F	5/12/48	5/19/48	126	
47(ANL)	BeO	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	1/14/48	127	
			1-30 da.	Has not been rec'd					
			1-90 da.	12/23/47	2666F	4/4/48	4/14/48		
			1-180 da.	Has not been rec'd					
48(ANL)	BeO	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	1/14/48	128	
			1-30 da.	Has not been rec'd					
			1-90 da.	12/23/47	2666F	4/4/48	4/14/48		
			1-180 da.	Has not been rec'd					
49(ANL) *	Graphite-U Oxide	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	2/11/48	129	
			1-30 da.	Has not been rec'd					
			1-90 da.	12/23/47	2666F	4/4/48	5/3/48		
			1-180 da.	Has not been rec'd					
*51(ANL)	Be	1 receptacle	2-3 mo.	1/6/48	1474D	3/19/48	5/3/48	133	
*53(ANL)	Te	1 casing	4 mo.	1/27/48	BTHF	5/26/48	--	134	
*54(ORNL)	Cu-Be Alloy	1 slug	2 mo.	1/6/48	1474D	3/19/48	5/3/48	135	
55(ORNL)	Stainless Steel	4 slugs	6 mo.	2/16/48	1774D 1665D	--	--	130	1
56(ORNL)	Be-Cu Alloy	2 slugs	6 mo.	1/27/48	1363F	--	--	136	0
57(ORNL)	CaCO	3 casings	6 mo.	1/27/48	BTHF	--	--	137	0
58(ORNL)	Zinc	1 casing	6 mo.	1/27/48	BTHF	--	--	138	0
59(ORNL)	Antimony	1 casing	6 mo.	1/27/48	BTHF	--	--	139	0
60(ORNL)	KCl	7 casings	1-2 wks.	2/16/48	BTHD	3/9/48	4/14/48	140	
			1-1 mo.	2/16/48	BTHD	4/4/48	4/14/48		
			1-3 mo.	3/2/48	BTHD	--	--	140	0
			1-6 mo.	2/16/48	BTHD	--	--		
			3-1 yr.	2/16/48	BTHD	--	--		
61(ORNL)	Co_3O_4	1 casing	6 mo.	1/27/48	BTHF	--	--	141	0

1223581

Technical Divisions

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
*62(ORNL)	Al-U^{235}	10 slugs	5-1 mo.	7 pcs. 2/16/48	1774D 3179D	4 pcs. 3/15/48	2 pcs. 4/14/48	145	
	Stainless U, Al			1 pc.			2 pcs.		
	Be		5-5 mo.	4/25/48	2382F		5/3/48		
*63(ORNL)	Al-U^{235} Alloy	21 slugs	7-3 mo.	4/11/48	1671D	--	--	146	5
			7-6 mo.	4/25/48	2382F	--	--		5
			7-12 mo.	4/25/48	1769D	--	--		
*64(ORNL)	Cu-Au	5 slugs	1-15 da.	4/11/48	2382F	4/25/48	5/3/48	142	
*	Alloy		1-30 da.	2/16/48	3179D	3/15/48	5/3/48		
			1-60 da.	--	--	--	--		
			1-150 da.	2/16/48	1774D	--	--		
*			1-300 da.	5/25/48	1769D	--	--		
*65(ANL)	Li-Al Alloy	2 slugs	3-4 wks.	2/16/48	3179D	3/19/48	5/3/48	143	
*66(ORNL)	U^{234}	2 casings	2&4 mo.	1 casing 3/9/48	BTHD	5/10/48	5/19/48	160	0
*67-76(ORNL)		Charged 2 samples of 68 and one of each of the other requests on 4/4/48							
*77(ANL)	Ra	1 slug	2 wks.	4/11/48	2382F	4/25/48	5/3/48	161	
*78(ANL)	Ra	1 slug	2 wks.	4/11/48	2382F	4/25/48	5/3/48	161	
79(KAPL)	U^{235}	Experiment being carried out by J. B. Lambert.							
81(ORNL)	Zn	3 casings	1 yr.	4/25/48	DTHF	--	--	164	0
82(ORNL)	N	1 casing	1 yr.	4/25/48	DTHF	--	--	165	0
*		1 casing	1 yr.	5/12/48	DTHF	--	--	165	0
83(ORNL)	TiO_2	1 casing	6 mo.	4/25/48	DTHF	--	--	166	0
84(ORNL)	$AgNO_3$	1 casing	1 yr.	4/25/48	DTHF	--	--	167	0
87(ORNL)	WO_3	1 casing	6 mo.	4/25/48	DTHF	--	--	181	0
88(ORNL)	Sn	1 casing	1 yr.	4/25/48	DTHF	--	--	181	0
89(ORNL)	Cd	1 casing	6 mo.	4/25/48	DTHF	--	--	181	0
ANL-100	Be	5 casings	6-12 mo.	3/24/48	BTHF	--	--	176	0
ANL-101	U^{238}	1 receptacle	4-6 mo.	--	Slug is being canned.				
*ANL-102	Cobalt	1 casing	2 wks.	5/12/48	DTHF	5/26/48	6/2/48T	192	

1223582

Technical Divisions

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
ANL-103	Rare earth oxides	1 casing	3 mo.	5/12/48	DTHF	--	--	186	
ANL-104	Gd	1 casing	3 mo.	5/12/48	DTHF	--	--	187	
*ANL-106	Graphite	2 casings	1 mo.	5/10/48	BTHF	--	--	199	
ANL-110	PuO_2	1 slug	6 mo.	--	--	--	--	--	
*ANL-111	PuO_2	1 slug	1 yr.	5/25/48	1769D			200	
*UCRL-100	Pu	1 slug	1½-5 yrs.	5/25/48	1769D	--	--	200	
*UCRL-101	Pu	1 slug	1½-5 yrs.	5/25/48	1769D	--	--	200	
*UCRL-102	Pu	1 slug	1½-5 yrs.	5/25/48	1769D	--	--	200	
*UCRL-103	Am	1 slug	2 yrs.	5/25/48	1769D	--	--	200	
*UCRL-104	Pu	1 slug	1-3 yrs.	5/25/48	1769D	--	--	200	
*UCRL-105	Am	1 slug	2 yrs.	5/25/48	1769D	--	--	200	

The following requests have been approved but the samples have not been received: ANL-105, ANL-107, ANL-108, ANL-109, ORNL-100 - 103, UCRL-106

PILE ENGINEERING

Corrosion and Blistering of Slugs

During the month it was discovered that rolled, lead-dipped slugs undergo a significant decrease in length and a corresponding increase in diameter during irradiation. Eight-inch slugs removed from the central portion of a column which had been irradiated for 294 MD/t had diameters as much as 0.028 inches greater than nominal and lengths as much as 0.26 inches less than nominal. One slug was warped so badly that the center was 0.076 inches out of line with the ends. It was apparent that rolled, lead-dipped slugs, even in four-inch lengths, would be unsuited for pile operation at high product concentrations. However, a major advance in the knowledge has been obtained by this demonstration that uranium crystals expand preferentially in one dimension under the influence of pile irradiation.

Production test results indicate that cold straightening of rods during slug fabrication has no significant effect on slug distortion during irradiation.

A production test, designed to simulate the operation of fringe tubes in piles running at higher power levels, was started in the D Pile. Selected tubes in each orifice zone were equipped with orifices smaller than nominal, and the permissible outlet temperature for these tubes was raised to 75°C.

On May 30 the first jacket failure in the history of the plant occurred in the

F Pile, in a column of slugs which had received only a one week exposure. The phenomenon was first detected by the Panellit measure of pressure at the entrance to the tube, and was subsequently confirmed by outlet temperature and activity from the tube. The volume of contaminated water was reduced by dropping to 3500 g.p.m. two hours after shutdown and to 2000 g.p.m. three hours after shut-down, following a procedure which had been established by production test earlier in the month. For the first time the water flow to a cross-header was completely stopped for a short while three hours after shut-down, in order to reduce the spread of contamination while isolating the defective tube from the water system.

Corrosion of Van Stone Flanges

The "Zyglo" facilities in the Works Laboratory, Schenectady, were used in an investigation of hair line cracks which might be created as Van Stone flanges are formed and which might provide focal points for the pitting of the flange. Under conditions of use, defects visible to the naked eye went undetected under test, but the sensitive test did demonstrate the presence of extremely fine cracks and pin holes. These latter defects showed no consistent correlation with the conditions under which the various flanges were formed, and are currently attributed to poor bonding of the Alclad layer. Attempts are being made to obtain "Zyglo" facilities here in order to continue this study.

"Teflon" and "MFT-10 Methyl-Flex" were demonstrated to be unsatisfactory materials for gaskets on Van Stone flanges because of cold flow properties under pressure.

Corrosion of Vertical Safety Rods

Borescopic examination of a vertical thimble in the F Pile showed the presence of a thick deposit of iron rust in the bottom of the thimble. This material, which presumably has been scraped from the rod and rod guide, is thick enough to prevent complete insertion of about twelve rods in both the D and F Piles. Borescopic examination of two thimbles in the B Pile revealed no indication of such deposits.

Graphite Expansion

The cork filler strip was removed from between the far side and concrete wall of the D Pile. After one week of pile operation the far side had moved out 1/4 inch at the top of the discharge face.

A nominal 25% CO_2 concentration was maintained in the D Pile atmosphere during the month. The effect on the rate of graphite expansion cannot be evaluated at present because it is within the limits of accuracy of measurements. However, there has been no increase in rate of expansion and possibly some decrease.

A modification of graphite stacking for the H Pile was suggested to decrease the difficulty in laying up narrow tube blocks. A four inch long tube block of full width would be placed between each of the four foot long narrow tube blocks and the axis of extrusion of the short block would be perpendicular to the tube in the horizontal plane. This proposal has been received with considerable interest, but it increases the load on the graphite machining operation so much that adoption of the proposal is still uncertain.

Technical Divisions

Tests indicate that the thickness of the wall of the gun barrel may be reduced as much as 30% without encountering operational difficulties. This design change has been recommended for the H Pile, in order that the more flexible gun barrel would apply less stress on the adjacent graphite block when the graphite is tilted by the expansion of the pile.

A mock-up of 25 graphite bars is being constructed for testing a 6 KW Calrod heater in preparation for annealing studies in the pile.

Segmented Discharge

The segmental discharge system by which a steel tape is used to pull hot slugs back into the active zone of the pile was subjected to a variety of tests culminating in a test at the B Pile with unirradiated uranium slugs. In this latter test the feasibility of the system was adequately demonstrated. Additional mechanical improvements are planned in order to improve the speed of the operation. However, the time at which segmented discharge may be adopted as routine operation practice is dependent primarily upon developments in the current program for attaining higher product concentrations by using improved types of slugs and normal discharge.

Beta Experiment

The first beta slug, containing enriched uranium and sodium, was operated from May 1 to May 12 in the F Pile. The slug is being stored out of water for two months before opening. A second beta slug, scheduled for a 70 day exposure, was charged on May 26.

Underwater Laboratory

Responsibility for further development of the Physical Testing Laboratory in Building 212-N was transferred this month to the Metallurgy Laboratory.

300 AREA PLANT ASSISTANCE

General

Effective May 17, this entire Group was placed on a 6-day work week. This step was necessitated by the press of process metallurgical development studies, and the start of 6-day 300 Area operations by the P Division.

Uranium Melting and Casting

An investigation of stopper rod breakage in the melt plant indicated a number of possible causes. This study and the resultant recommendations have been recorded in a memorandum to the P Division (Doc. HW-9745, dated 5-11-48). Experimental work is in progress to eliminate this difficulty.

Chemical analytical data on casting heats made from 500-pound solid scrap charges indicated that the carbon pickup by molten uranium could be held to 300-500 ppm by melting with an energy input of 90-k00 KWH, Use of the energy input to indicate the correct pouring time was recommended to replace the less reliable optical pyrometer temperature measurements.

1223585

Zirconite mold wash was received by the plant from the Titanium Alloys Manufacturing Co. This wash is being tried in different types of slurries to determine whether mold erosion can be reduced without causing the objectionable surface porosity encountered heretofore with graphite slurries.

Alpha Phase Extrusion of Uranium

Successful alpha phase extrusion was accomplished on one 4½" diameter by 13" billet, using a bell-mouth die having three-holes (each 1.455" diameter), a mirror-honed container burnished with graphite powder and further lubricated with a graphite-water slurry, and a scalped billet. This billet, preheated to an estimated 1180°F, required a peak extrusion pressure of 750 tons. This was much lower than ever before experienced in bare billet alpha extrusion attempts with Hanford equipment. However, the rods were poorly formed and the butt was difficult to remove from the die.

Since recent pile tests have indicated that rolled metal slugs lead-dip canned in the alpha phase are unstable dimensionally, and exhibit an exaggerated tendency to warp during pile irradiation, further work on alpha extrusion has been suspended. This pile behavior is due presumably to the high degree of preferred orientation conferred by rolling, and it is expected that the orientation in alpha extruded rods would be very similar to that in rolled rods.

Alpha Phase Rolling of Uranium

About 191 tons of uranium billets were alpha rolled at Lockport and Ft. Wayne during the month under the supervision of 300 Area Plant Assistance personnel.

Roll breakage was encountered for the first time since the start of the current rolling program when four rolls were broken in the 16" roughing stand at Lockport during the May 24-29 run. Breakage was attributed to (1) the unusually large roll pressures incurred when 4-3/4" diameter billets (intermixed with 4½" billets) were processed without using special rolling conditions, and (2) the widely varying billet preheat temperatures. Furnace equipment having better temperature control than that now available at Lockport is needed for preheating billets.

Duplexing of Uranium

A net weight of about 6 tons of oversize uranium rods, which were gamma extruded with the 300 Area press on May 6 under P.T. 314-55-M, were rolled to 1-7/16" diameter at Lockport on May 24-26. Four extruded rod diameters (1.563", 1.625", 1.688' and 1.750") were used. The bulk of these special rods were rolled using a 650°F preheat to give reductions of 15-30%. This material will be evaluated in the piles. Experimental runs with a few rods were made at 850°F and 1100°F, and to provide reductions of 4-11% at 650°F for metallurgical examination.

Slug Machining

Machining cleanup studies on 21 uranium rods alpha rolled to 1-7/16" nominal diameter at Lockport showed that machining yield is not significantly higher than with the 1.450" diameter presently considered standard for these rods.

1223586

Technical Divisions

Slug Canning

Revised Operating Processes covering triple-dip and lead-dip canning of four-inch slugs, chip recovery, and slug recovery were issued (Docs. HW-9393, 9401, and 9402).

In view of the discovery that alpha rolled lead-dipped slugs not only warp severely but also undergo diameter increase (with length decrease) during pile exposure, it was decided that an immediate return to triple-dip canning should be made. Pile exposure observations with triple-dipped rolled slugs have indicated them to be the best compromise between blistering and dimensional stability, due presumably to the crystal randomizing effect of heating into the beta phase during the bronze dip. The triple-dip canning process was started again by the P Division on May 17.

Since the conditions of the bronze-dip may be critical to this structural transformation, experimental work has been started under P.T. 313-104-M to determine the time-temperature relationship in this dip required to give an optimum metal structure.

Special Request Work

Special Requests numbered ANL-111, 40-5, and 64 were canned and delivered to the P Division.

METALLURGY LABORATORY

Alpha Rolled Uranium

A major discovery concerning the behavior of uranium under pile exposure has resulted from the irradiation of alpha rolled metal. The conclusion reached is that uranium's distortion or growth is analogous to that of graphite in that the C-axis expands as a ± function of exposure; however, in uranium the volume remains constant within less than 1%.

Results of Schenectady Research Laboratory studies of diffraction patterns of a transverse and a longitudinal section of an alpha rolled Hanford slug indicate that the normal to the (110) plane of each of the uranium crystals is within 30° of the rolling direction. This means that the C-axis lies perpendicular to the rolling direction, and parallel to the radius of the rod. Recent results on the pile behavior of alpha rolled material show that lead-dipped slugs made from rod having this fine grain structure and preferred orientation expand uniformly in a radial direction and contract in length. It is thus apparent that the direction of expansion in uranium is comparable to the direction of expansion in graphite. It also appears that the assumption that the slug blistering problem would be solved by obtaining uranium having a fine grain, randomly oriented matrix is correct.

The only immediately available possibility of obtaining randomness of orientation, although at some sacrifice or grain size, was to transform the alpha rolled metal slugs completely to the beta phase during the bronze dip of the triple-dip canning process. Accordingly, lead-dipping was discontinued in favor of triple-dipping (effective May 17). To establish a maximum and minimum time and

1223587

DECLASSIFIED
WITH DELETIONS

temperature in the bronze bath to transform completely the slugs to the beta phase and yet retain the smallest possible grain size, approximately 300 were bronze dipped at various times and temperatures for laboratory study. Most of the examinations were done by macro-etching and measuring the depth of the alpha-beta transformation along the slug radius. Although this work is not yet complete, a sufficient number of slugs were examined to establish fairly definitely a minimum time for different operating temperatures. It appears that a bronze temperature minimum is required with the standard bronze dipping time. Microscopic investigation showed no appreciable grain growth with long immersion times , or with high temperatures ; hence, maximum times and temperatures do not appear too critical. The results also showed little or no difference between annealed and unannealed alpha rolled material.

Samples taken from twenty-two plant containers of annealed alpha rolled rods were examined and found to be satisfactory for further processing.

Seven alpha rolled slugs which were rejected after pickling or during canning were examined for the cause of surface defects. The cracks observed on the outer surfaces were attributed to the rolling technique, or to the relief of residual stresses during pickling. These rejected slugs appeared to be of poor quality metal.

Duplexed Uranium

Work on metals other than uranium has shown that the degree of preferred orientation generally is a function of the degree of reduction in area and of the nature of the starting material (i.e., grain size, orientation, etc.). In many cases, especially with face-centered-cubic metals, the degree of orientation increases with the amount of cold work. Following this line of reasoning it appears that the most randomized orientations might be obtained by small reductions in rods already having a degree of randomness as is obtained in gamma extruded material, although the most desirable results may not be obtained due to the large grain size of the latter.

Samples taken from rods which were gamma extruded to four different diameters and then sent to Lockport for alpha rolling (see 300 Area Plant Assistance report) were received by courier. Recrystallization and orientation studies were started immediately. A similar set of samples was sent directly from Lockport to the Schenectady Research Laboratory for expedited orientation determinations.

Examination of Irradiated Uranium

Two wafers, from slug #258, were macro-etched during the month. The macro-etching procedure commonly used on non-irradiated uranium did not reveal any definable structure, but did show that the previously reported "stains" probably really were stains caused either by slow drying or a scum formation resulting from dissolution of some of the fission products. It is apparent that either the solutions for etching or the solutions for rapid drying must be altered or replaced in order to reveal the irradiated structure satisfactorily.

DECLASSIFIED
WITH DELETIONS

1223588

The Rockwell K hardness of irradiated uranium appears to be approximately 15 points harder than non-irradiated uranium. A table model Rockwell tester has been received.

A static corrosion test of a cut wafer of irradiated uranium in water indicated a slight amount of loss. 1000 c/m/ml of alpha and 100 c/m/ml of gamma activities, a beta plus gamma activity of 1.5×10^4 c/m/ml, and 0.6% by volume of suspended solids were noted in the 235 ml of water.

Effective May 10, responsibility for the underwater physical testing facilities in the 212-N Bldg. was transferred to the Metallurgy Laboratory from the Pile Engineering Section. The Rockwell tester was modified to allow above-water testing of irradiated wafers, as noted above.

Hardness Studies on Uranium

In a continuation of work on the microhardness of uranium grains, it was found that twin bands, which were optically equivalent to the bands observed in uranium grains under polarized light, were formed adjacent to the indents. This substantiates the belief based on previous observations by the laboratory that the bands observed in uranium grains are mechanical twins. In addition, deformation bands, which were previously reported as a possible indication of slip, were again observed adjacent to the indents; however, on repolishing these bands remained as twinned areas. Thus, while it seems apparent that uranium will deform quite readily by twinning, as yet no metallographic evidence has been obtained for the occurence of slip.

X-Ray Diffraction Studies

Preliminary spectrometer tracings were taken from a disk cut from a copper-jacketed rod alpha extruded in the 300 Area. Two tracings were made, the sample being rotated 90° in the plane perpendicular to the rod axis. Tracings were identical with the exception of one line at 28° which was not identified. All possible planes of reflection from (000) to (444) for uranium were calculated and similar work is in progress for U_3O_8. A tracing of the latter was made using a sample prepared by the spectrochemical laboratory.

A sample holder was designed for orientation work, since the high absorption of the metal will probably not permit the use of the classical orientation methods. The cut-off wheel vise was redesigned to permit cutting of variable angles on the same specimen. Accuracy is not expected to exceed $\pm 5°$, depending upon the quality and thickness of the wheel used.

Experimental Equipment

Orders have been placed for an x-ray spectrometer and an x-ray diffraction unit with accessories. Specifications were drawn up for a two-high 6" diameter by 6" face laboratory rolling mill, and quotations are being obtained from four manufacturers.

Redox Corrosion Tests

Routine checking of stainless steels in static Redox solutions has continued, and the dynamic corrosion units for checking selected stainless steel samples in these same solutions are nearing completion in Bldg. 3706.

Miscellaneous

Limited stainless steel weld tests to determine the corrosion resistance of these various steels welded with different types of welding rod were completed for the Design Division.

ANALYTICAL LABORATORIES

Work Volume Statistics

The following tabulation shows the source and volume statistics for samples on which analyses were completed:

	April		May	
	Samples	Determinations	Samples	Determinations
Routine Control - 200	1628	2563	1995	3545
Routine Control - 300	625	3366	1106	5939
Water Control - 100, 700	9554	16955	9950	18853
Redox Control	1799	6675	1667	5228
Process Reagents	852	1554	965	1773
Essential Materials	79	314	120	559
Special Samples	2349	3492	2502	4028
Totals	16886	34919	18305	39925

200 Area Process Control

Routine measurements of the geometry of the methane proportional alpha counting instruments (accepted value 50.50%) in the 200 Area Control Laboratories were as follows:

Laboratory	Ave. Geometry (%)	No. Tests
B & T Plant	50.51	121
Isolation Bldg.	50.55	98

The precision of the analytical results of the canyon starting solutions (8-1-MR), the Isolation Bldg. starting solution (P-1), and the final product solution (AT) may be summarized as follows:

	April		May	
Sample	Precision (± %)	No. Out of Control	Precision (± %)	No Out of Control
8-1-MR	1.24	15	1.33	6
P-1	1.62	2	1.64	3
AT	1.54	7	1.29	8

1223590

The standard iron solution used in the Isolation Laboratory to check the chemical titration of plutonium was analyzed a total of 86 times during the month. There were 25, 11, and 4 results inside ± 1%, ± 2% and outside ± 2% of the assay values, respectively. The average precision for duplicate titrations was ± 2.04% as compared to ± 2.71% for April. A summary of the results follows:

Assay Value	Group Ave.	% Diff.	No. Determinations	Precision (± %) Single	Precision (± %) Duplicate
10.18	10.38	+ 0.2	16	1.83	1.29
10.76	10.88	+ 0.1	12	2.95	2.09
14.84	14.89	+ 0.05	18	2.41	1.70
13.57	13.55	- 0.02	40	3.52	2.49

The synthetic 8-1-MR was analyzed 16 times in the B & T Plant Control Laboratory (222-B). The standard precipitation was used with the percent recovery based on 2.077×10^6 c/m/ml. The results were:

Month	Ave. Results ($\times 10^6$)	No. Assays	% Recovery
April	2.036	19	98.0
May	2.026	16	97.5

300 Area and Essential Material Control

Analytical service for the triple-dip canning process was established on May 17. Coincident with this change, personnel assigned to 300 Area and Essential Material Control were placed on a six-day work week (suiting P Division schedule).

Difficulties with "popping" of uranium samples, when analyzed spectrographically, were corrected. Lucite chips from a misaligned grinding wheel used for fabricating the electrodes were being deposited on the electrodes. This caused the sample to "pop" upon striking the arc.

Graphite Analysis

Functional tests indicated that two bars of graphite did not meet purity requirements. Analysis verified that one bar had a high boron content and that the other was contaminated with vanadium. As a result, further testing has been scheduled.

Redox Process Control

Routine analytical control for the Redox program continued without incident. At month end 123 personnel were assigned to these laboratories as follows: 73 in Bldg. 3706 and 50 in Bldg. 222-T (200-W Area). An additional 26 were being trained for this work in the 100 Areas. A special analysis unit has been formed within this group to analyze all Redox samples originating in the Chemical

Research Section. This work was formerly done by the General Chemical Laboratory.

Analytical Development - Redox

Aluminum can be determined in iron-free Redox solutions by precipitation with 8-hydroxy quinoline (oxine), using amonium carbonate to maintain the UNH in solution. The aluminum quinolate is washed free of excess reagent, dissolved in dilute HCl, and titrated with potassium bromate. Estimation of low amounts of aluminum in the presence of iron has been accomplished by determining iron and aluminum together by the colorimetric hematoxylin method and correcting this result by means of an independent analysis for iron.

Investigation of the oxalate method for the determination of nitric acid resulted in an improvement in the location of the end-point of the titration. To assure careful complex control, only a slight excess of an aqueous solution of potassium oxalate is added. The resulting mixture is cooled to 1-3°C during the titration to prevent hydrolysis of the uranium oxalate. Preliminary results obtained using a high vacuum distillation (less than 1 mm. Hg pressure) to separate nitric acid from other constituents of Redox solutions have been promising. This technique is applicable to small sample sizes, but will require considerable development before being applied to control analysis.

A final report has been issued (Doc. HW-9898, dated May 27) describing the potassium fluoride method for the analysis of nitric acid in the presence of aluminum.

Methods now used to determine total Pu(IV) in the bismuth phosphate process were investigated for their suitability to 1AF stream samples. An analysis of 1AF by these methods for total plutonium gave an average recovery of 99.3% with a standard deviation of 1.1%. Analysis of Pu(IV) in the 1AF by this method gave average recoveries of 100% with a standard deviation of 0.8%.

Since the gamma radiation expected in the final product solution from the test plant (IIBP) is below that measurable with the BGO instrument, a study was made of the possibility of using a Shonka Ionization Chamber for this determination. Calibration of the Shonka instrument with Co^{60} indicated the usable range for this instrument was from 0.3 to 7 millirutherfords, with the optimum range being from 1.0 to 7.0 millirutherfords. The calibration of the instrument was constant throughout its usable range. As the gamma radiation from 10 ml. of the IIBP is expected to be approx. 0.8 millirutherfords, the Shonka instrument should be sufficiently sensitive for use.

Analytical Development - Miscellaneous

Chemical analysis of a sample of radio-active algae was completed and the results were forwarded to the Medical Division. Positive indication of organic chlorides were obtained on samples of animal tissues analyzed for the same Division.

Development of a more accurate method for the spectrographic analysis of stainless steels continued. All major constituents, with the exception of nickel, can now be determined satisfactorily.

1223592

Technical Divisions

The development of methods for the analysis of "hot" waste for U, PO_4, SO_4, CO_3 and Pu is proceeding. Using synthetic samples of similar composition, acceptable recoveries can be obtained for all the above ions except carbonate.

Results obtained on a modified ASP counter, operated for three weeks without any adjustments, were submitted for statistical analysis. Indications are that the instrument operated in control throughout the test period.

Special Hazard Control

In order to make information on the laboratory control of radiation more readily available, a report is being prepared in which all blueprints of especially designed remote handling equipment will be listed.

Design of a four-foot decontamination sink and supporting table has been completed. Design of a suitable waste receptacle to be used in conjunction with the above unit has been started.

STATISTICAL STUDIES

Product Accountability

The Statistics Group has been requested to establish the precision and accuracy of plutonium measurements on outgoing product. A survey is being made to determine the data required.

Graphite Quality

At the request of the Pile Physics Section, correlations were run between boron content, bar temperature, and dih of purified graphite bars.

Slug Blistering

Warp and length data after irradiation of slugs from PT 105-119-P have been analyzed statistically.

Stuck Slugs

A study was made to determine whether tube location in the pile had any effect on the probability of finding stuck slugs.

Dimensions of 4" Slugs

The limits for the dimensions of 4" alpha rolled uranium slugs were estimated from measurements of a random sample of 120 slugs from routine production.

Viscosity Computations

At the request of the Chemical Research Section, mathematical equations for computing viscosity were fitted by the least squares method, and from these equations approximately 400 viscosities were computed. Charts are being prepared showing the effect on viscosity of the composition of the various Redox solutions studied.

1223593

Technical Divisions

Radio Assay Instrument Control

Several statistical control charts were constructed for the 300 Area radio assay counting room.

Blood Count Data

The statistical studies previously requested by the Medical Division are now completed. A discussion of the results was held with Dr. P. A. Fuqua of that Division and Dr. S. T. Cantril, consultant.

LIBRARY AND FILES

General

A conference was held with Mr. T. T. Beach, Chief, Records Management Branch, A.E.C., Washington, D. C., on the possible adaptation of the U.S.A.E.C. Standard Subject File Manual to the filing of correspondence at Hanford Works.

Plant Library

Work on the acquisition, cataloging, and circulation of books proceeded on a routine basis, with a large shipment of periodicals being shipped to the bindery.

Abstracts are being prepared on a current basis on all technical reports, although actual duplication of the index cards for these is awaiting the assignment of personnel and space to the Office Services Unit which will undertake this responsibility. The final draft of an expansion of a section of CA1927, intended to supply a more adequate number of subject headings for use in abstracting and and indexing Redox reports, was completed and forwarded to the A.E.C. for inclusion in the revised CA1927 expected shortly.

Library statistics were as follows:

	April	May
Number of books on order received	373	317
Number of books fully cataloged	244	313
Number of bound periodicals processed but not fully cataloged	217	263
Pamphlets added to pamphlet file	62	209
Miscellaneous material received, processed, and routed (includes maps, photostats, and patents, etc.)	61	57
Books and periodicals circulated	659	632
Reference services rendered	504	501

1223594

Technical Divisions

Present book collection is as follows:

	Main Library	W-10 Branch	Total
Number of books	2356	829	3185
Number of bound periodicals	1655	89	1744

300 Area Classified Files

The receipt, issuance, and routing of documents proceeded routinely. The policy of distributing abstracts rather than routing reports was extended to include all Research and Development reports received from offsite.

The initial report requested in the confidential memorandum from John E. Gingrichs, Director of Security and Intelligence, A.E.C., Washington, D. C., covering Technical reports received and distributed, secondarily reproduced, revised or delected, reclassified or declassified, and destroyed, was completed for March and April and submitted to the Central Document Control Office in Washington, D.C.

The Series B issue of the Hanford Works Technical Manual was substantially completed.

Arrangements were completed with and confirmed by the local A.E.C. authorizing the Files to request Research and Development reports directly from the A.E.C Technical Information Division, Oak Ridge, Tennessee. This should materially expedite the receipt of requested reports.

File document statistics were as follows:

	April	May
Documents routed	3215	3791
Documents issued	747	865
Reference services rendered	1385	3476

The increase in reference services rendered was due to the added technical personnel in the 300 Area.

1223595

SERVICE DIVISIONS

MAY 1948

SUMMARY

Employee and Community Relations Division

Applicant interviews increased from 1,496 in April to 2,350 during May. Open requisitions for additional personnel increased from 970 to 1,062 during the same period.

Number of employees on roll 5-31-48 - 8,259.

During the month, 1,185 contacts were made by Employee Relations Counselors. U. S. Savings Bond Campaign launched May 10 and extended through May 31. Eighteen suggestion awards, totaling $195, granted during the month.

Twenty general news items were prepared for release to Richland Villager, Tri-City Herald, and Spokane Chronicle. News releases and photographs on flood conditions in Richland prepared and released to Associated Press in Seattle and newspapers of other communities.

Fifty-six Supervisory Conference Training groups totaling 572 members of supervision completed training program during May.

Labor Relations and Wage Rate Division

The principal activity of this division during the month has been concerned with the proposed salary rate structure. Approximately 70% of all non-exempt employees have been reclassified in accordance with the job classifications of the proposed plan.

Plant Security and Services Division

Forty-four employees were transferred to the Construction Division Security Section to handle sub-contractor clearances.

There were two major injuries during the month, which brought the total for the year to four.

There were ten minor area fires resulting in no loss.

Additional telephone switchboard facilities were completed, which increases the number of positions from 13 to 18.

Two additional toll and four leased lines were installed to Pasco.

Service Divisions Summary (Continued)

Purchasing and Stores Division

Requisitions have been prepared for third quarter requirements under the steel allocation program. Definite allocations should be received by June 15.

Contracts for steam coal were awarded to Continental Coal Company for 250,000 tons and to Big Horn Coal Company for 150,000 tons.

1223597

SERVICE DIVISIONS

MAY, 1948

EMPLOYEE AND COMMUNITY RELATIONS DIVISION

ORGANIZATION AND PERSONNEL

Employment

Effective May 10, one investigator was transferred to the Construction Division. The clerk (investigator), who tendered his resignation effective April 30, agreed to temporary assignment in the Design Division and, as a result, was transferred to that division, effective May 3.

Three typists were added to the Procurement group, one effective May 3, another effective May 7, and the third effective May 27.

Two office helpers were added to the Procurement group, one effective May 19 and the other effective May 24. An office helper, who was assigned to the Investigation group, was transferred to the Design Division as a typist, effective May 8.

Two messengers were added to the Procurement group, effective May 28.

Employee Relations

One typist was added, effective May 18, to this group to assist the Suggestion System Secretary.

Public Relations

No organization changes were made in this group during the month of May.

Education and Training

In accordance with Nucleonics Department Organization Announcement Number A-10, F. Ellis Johnson was transferred from the Education and Training Group to the staff of the General Manager, effective May 17. In connection with this transfer, one secretary was also transferred to the staff of the General Manager.

One stenographer was transferred to the Accounting Stenographic Pool, effective May 3.

1223598

Service Divisions
Employee and Community Relations Division

Number of Employees on Payroll	May
Beginning of month	90
End of month	93
Net increase	3

This additional personnel was required due to an increase in volume of work.

ACTIVITIES

Employment

As a result of extensive newspaper advertising, the volume of employment interviews increased appreciably during May. A total of 2,550 applicants were interviewed during May, as compared with 1,496 during April. The number of new cases received for investigation increased from 748 in April to 897 in May.

At the beginning of the month there were 820 open requisitions for non-exempt personnel, 512 of which were covered by interim commitments. At the end of the month

PATROL DIVISION - COMPARISON CHART OF NORTH RICHLAND OFFENSES

Number of offenses known to Police per 10,000 inhabitants, in cities between 10,000 and 25,000 inhabitants:

	Wash., Oregon & Calif.		Richland		
Classification	Six Months (Jan-June 1947)	One Month Average	Six Months (Jan-June 1947)	April 1948	May 1948
Murder	.688	.114	0	.0	.0
Robbery	19.57	3.26	0	2.66	.66
Aggravated Assault	11.23	1.87	0	3.33	3.33
Burglary	114.53	19.09	0	.66	.66
Larceny	296.10	49.35	0	27.33	13.33
Auto Theft	57.73	9.62	0	1.33	2.66

Number of offenses known to Police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural districts:

	State of Washington		North Richland		
Classification	Six Months (Jan-June 1947	One Month Average	Six Months (Jan-June 1947	April 1948	May 1948
Murder	.184	.30	0	.0	.0
Robbery	5.11	.85	0	2.66	.66
Aggravated Assault	1.62	.27	0	3.33	3.33
Burglary	36.20	6.03	0	.66	.66
Larceny	91.39	15.23	0	27.33	13.33
Auto Theft	19.79	3.30	0	1.33	2.66

The portion of offenses committed by persons under the age of 25 years is shown by the following figures:

	National Average	North Richland		
Classification	Six Months Jan-June 1947	Six Months (Jan-June 1947)	April 1948	May 1948
Robbery	56.1%	0	0	0
Burglary	61.0	0	0	0
Larceny	46.0	0	0	.06
Auto Theft	74.1	0	0	0

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 records is doubtless incomplete in the lower age group because of the practice of some jurisdiction not to fingerprint youthful offenders".

In North Richland every delinquent juvenile is entered in the records.

1223673

1223674

MAY 1948

PATROL DIVISION - RICHLAND OFFENSES

Classification of Offenses	Offenses Known or Reported to Patrol	Offenses Unfounded	ACTUAL OFFENSES April	ACTUAL OFFENSES May	Offenses Cleared By Arrest	Offenses Cleared By Other Action	Perpetrators Involved
Assault	2	1	3	1	1	0	1
Attempted Suicide	0	0	0	0	0	0	0
Burglary-Breaking and/or Entering	5	0	0	5	0	0	(u)
Attempted-Breaking and/or Entering	3	0	0	3 (a)	0	1	3
Robbery	0	0	0	0	0	0	0
Larceny-Theft (except auto & bike)							
(a) - $50.00 and over value	5	0	1	5	0	1	1
(b) - Under $50.00 value	16	1	16	15	0	0	(u)
Auto Theft	3	0	4	3	0	1	1
Attempted Auto Theft	0	0	1	0	0	0	0
Bicycle Theft	15	1	5	14	0	0	(u)
Weapons: Carrying-Possessing-Using	1	0	0	1	0	0	(u)
Destruction of Government Property	9	0	5	9 (b)	0	3	4
Destruction of Personal Property	3	0	3	3	0	1	1
Destruction of School Property	0	0	0	0	0	0	0
Disorderly Conduct	4	0	7	4	0	4	4
Drunkeness	9	0	7	9	9	0	10
Embezzelment and Fraud	1	0	9	1 (c)	1	0	1
Forgery	0	0	0	0	0	0	0
Gambling	0	0	0	0	0	0	0
Missing Persons	4	0	1	3 (d)	0	2	2
Offense against family & children	0	0	0	0	0	0	0
Pickup for outside agency	0	0	0	0	0	0	0
Prowlers	2	0	4	2 (e)	0	1	1
Public Nuisance	2	0	2	2	2	0	3
Rape	0	0	0	0	0	0	0
Sex Offence	0	0	1	0	0	0	0
Cohabitation	0	0	0	0	0	0	0
Vagrancy	2	0	0	2 (f)	2	0	2
Violation State Game Laws	0	0	0	0	0	0	0
Violation State Liquor Laws	0	0	0	0	0	0	0
Miscellaneous	2	0	1	2	0	2	3*
Juveniles (other than reported above)							
Disorderly conduct	1	0	6	1 (g)	0	1	1

339

PATROL DIVISION - RICHLAND OFFENSES (CONTINUED)

(a) One of the offenses was perpetrated by three juveniles of ages 8 and 11 years. *1 colored male
(b) Three of the offenses were perpetrated by four juveniles of ages 10 and 13 years.
(c) The one offense was perpetrated by a person of age 20 years.
(d) The three offenses were perpetrated by two juveniles of ages 14 and 19 years.
(e) One of the offenses was perpetrated by a juvenile of age 11 years.
(f) One of the offenses was perpetrated by a person of age 24 years.
(g) The one offense was perpetrated by a juvenile of age 12 years.

Value recovered during May was $2,310.00 (includes 2 autos and 9 bicycles).

1223676

MAY 1948

PATROL DIVISION - NORTH RICHLAND OFFENSES

Classification	Offenses Known or Reported to Patrol	Offenses Unfounded	Actual Offenses April	Actual Offenses May	Offenses Cleared By Arrest	Offenses Cleared By Other Action	Perpetrators Involved
Assault	5	0	5	5	2	1	3
Attempted Suicide	0	0	0	0	0	0	0
Burglary-breaking and/or entering	1	0	1	1	0	0	0 (u)
Larceny-Theft (except auto & bike)							
(a) $50.00 and over value	11	2	11	9	0	2	2
(b) Under $50.00 value	11	0	30	11	0	3	3 (a)
Auto Theft	4	0	2	4	2	1	3
Bicycle and Motor Bike Theft	0	0	0	0	0	0	0
Carrying Concealed Weapon	0	0	0	0	0	0	0
Destruction Government Property	0	0	4	0	0	0	0
Destruction School Property	0	0	0	0	0	0	0
Destruction Personal Property	0	0	2	0	0	0	0
Disorderly Conduct	0	0	0	0	0	0	0
Drunkeness	54	0	33	54	54	0	54
Embezzelment and Fraud	0	0	0	0	0	0	0
Forgery	1	0	0	1	0	0	0 (u)
Gambling	7	0	3	7	7	0	7
Missing Persons	2	0	2	2	0	2	2
Offenses against family & children	0	0	0	0	0	0	0
Prowlers	1	0	0	1	0	0	0 (u)
Public Nuisance	14	0	13	14	14	0	14
Rape	2	0	0	2	1	0	1 (b)
Robbery	1	0	4	1	0	1	1
Sex Offences	0	0	0	0	0	0	0
Vagrancy	7	0	10	7	7	0	7
Violation of State Game Laws	0	0	0	0	0	0	0
Violation of State Liquor Laws	0	0	0	0	0	0	0
Miscellaneous	3	0	6	3	0	3	3
Juveniles (other than reported above) Disorderly Conduct	0	0	0	0	0	0	0
	124	2	126	122	87	13	100 (c)

(a) One of the offenses wasperpetrated by one juvenile, age 12.

(b) One of the offenses was attempted rape against child, age 9.

Value of property recovered during the month of May - $3567.23.

12236

PATROL DIVISION - TRAFFIC CONTROL STATISTICS
May - 1948

MOTOR VEHICLE ACCIDENTS

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	April	May	April	May	April	May	April	May
Plant	3	7	0	0	1	0	0	8
Richland	27	32	0	0	0	3	2	10
North Richland	13	13	0	0	0	0	4	1
Totals	43	52	0	0	1	3	6	19

ACCIDENT CAUSES

	Negligent Driving		Failure to Yield Right-of-Way		Reckless & Drunken Driving		Other Causes	
	April	May	April	May	April	May	April	May
Plant	1	4	0	1	0	0	2	2
Richland	22	8	6	13	2	1	0	11
North Richland	11	5	3	4	0	1	0	3
Totals	34	17	9	18	2	2	2	16

[illegible] WARNING TRAFFIC TICKETS ISSUED

	Speeding		"Stop" Sign		Parking		Imp. License		Def. Equip.		Other Violations		Totals	
	April	May	April	May	April	May	April	May	April	May	April	May	April	May
Plant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Richland	4	0	3	8	159	79	0	6	38	64	3	8	207	165
N. Rich.	2	8	3	0	190	217	6	0	30	48	2	0	233	273
Totals	6	8	6	8	349	296	6	6	68	112	5	8	440	438

COURT CITATION TRAFFIC TICKETS ISSUED

	Speeding		"Stop" Sign		Drunken Driving		Reckless Dr.		Neg. Dr.		Parking V.		Other V.		Totals	
	April	May	April	May	April	May	April	May	April	May	April	May	April	May	April	May
Plant	2	1	2	1	0	1	0	1	2	1	0	0	0	1	6	6
Richland	38	34	22	19	6	5	2	1	27	24	64	63	23	20	182	166
N. Rich.	35	22	24	24	1	3	0	0	22	30	3	7	16	28	101	114
Totals	75	57	48	44	7	9	2	2	51	55	67	70	39	49	289	286

TRAFFIC VOLUME Count taken on 5-3-48, Goethals Drive just north of Knight Street - 24 hour period - 9,356 Cars.

Note: Due to late reporting, five accidents that occurred in Richland and three that occurred in North Richland during the month of April are included in May totals.

Two accidents that occurred in the Plant Area during the month of April are included in May totals.

1223678

PATROL TRAFFIC SECTION

[illegible] JUSTICE COURT CASES

MAY, 1948

Violation	Number of Cases	Number of Convictions	Total Fines	[illegible]	Sentenced to Jail	Sentence Suspended	License Revoked	Average Fine Paid	Cases Dismissed	Warrants Issued
Drunken Driving	7	7	$417.50	$25.0	1	1	7	$56.07	0	0
Reckless Driving	2	2	55.00	[illegible]	0	0	2	27.50	0	0
Negligent Driving	14	13	301.6	None	0	0	0	23.20	0	1
Speeding	55	51	549.75	81.25	0	0	0	9.18	1	3
Stop Signs	41	38	201.00	13.00	[illegible]	0	0	4.94	2	1
Failure to YROW	6	6	63.00	40.00	0	0	0	3.83	0	0
Improper Passing	34	34	236.25	32.50	0	0	0	5.99	0	0
Improper Parking	63	63	228.00	21.00	0	0	0	3.28	0	0
No Arm Signal	2	2	8.50	None	0	0	0	4.25	0	0
No Driver's License	29	20	104.91	[illegible]	[illegible]	1	0	2.82	6	3
Failure to Stop and Identify	1	1	2.75	None	0	0	0	2.75	0	0
Defective Equipment	4	4	26.16	None	0	0	0	6.54	0	0
Improper Use of Spotlight	2	1	6.25	None	0	0	0	6.25	1	0
Improper License Plates	5	5	19.50	3.50	0	0	0	1.30	0	0
Failure to Flare Car	1	[illegible]	2.75	None	[illegible]	0	0	2.75	0	0
Public Intoxication	68	68	857.50	55.[illegible]	[illegible]	[illegible]	0	12.53	0	0
Public Nuisance	19	19	292.50	32.50	[illegible]	[illegible]	0	12.63	0	0
Vagrancy	6	6	57.50	32.50	[illegible]	3	0	4.16	0	0
3rd Degree Assault	2	2	[illegible]	[illegible]	2	[illegible]	0	None	0	0
Possess. of Gambling Equipment	1	1	100.00	None	0	0	0	100.00	0	0
Gambling	4	4	45.00	None	0	0	0	11.25	0	0
Disorderly Conduct	2	2	45.00	27.50	0	0	0	8.75	0	0
	368	350	$3575.48	$[illegible]	13	10	9		10	8

Total Fines $3575.43

Less Fines Suspended 441.75

Total Fines Received [illegible]

The Above includes violations that occurred on the Hanford Works Project.

PUBLIC WORKS DIVISION

GENERAL

Rising water in the Columbia river appeared as though it might become serious late Thursday, May 27. By Friday the 28th it was very apparent that the water of this river would rise to a stage which would damage property unless steps were taken. Construction crews proceded to build dikes around the banks of the river and various preparations were made by the Public Works groups to prevent damage to property, as follows:

All equipment, material and machinery in the labor yard which might be damaged by water was removed to other storage areas.

Park benches and tables were removed from the area it was anticipated would be flooded.

Sewer connections to the swimming pool buildings, Village Players' hutment, and the Masonic Temple were disconnected and plugged so that flood waters would not enter the sewage system.

Electric hot water heaters were disconnected and removed from the basements of houses in the 1400 block on Haines where water was seeping into the basements.

Basement floor drains were plugged and a small amount of water run into the basement to offset pressures from the rising river and keep dirt and sand from entering the basements.

All material in these basements was removed to back yards and covered with tarpaulins for protection.

Water test holes were dug at various places adjoining the dike and at other low locations in order that checks could be made on the seepage of water in the ground from the river.

During the period of rising water and while in the process of constructing the dike the water main on the east side of Haines was broken in two places which made it necessary to cut off the water supply to all houses facing on Haines for approximately sixteen hours. Repairs were made to these lines and the lines chlorinated before they were returned to service.

Blockading of roads and roping off of unsafe areas was accomplished by labor crews during the stages of constructing the dike. They were also called upon to vacate one house completely, and furnished other houses which could be used in cases of emergency if other residents living along the dike might need to be removed.

The labor group was also called upon to obtain bedding and linen from Pasco for use in North Richland in providing housing for workers who were unable to return to their homes.

It appears from an inspection of the area along Haines in the 1400 block that areas over sewer and water lines are settling due to the river water seeping into the areas around the sewer and water lines leading to the houses. It is very likely that considerable filling and reseeding of those areas will be necessary, and it is also possible that this settling of the ground may cause water and sewer line breaks in the immediate future where this settling has occurred as a result of the flood.

Project C-254, Exterior Painting of 514 Permanent Type Houses, was approved and bids were obtained to accomplish this work through Design and Construction. Due to the variation in bids the contract has not been let, but it is hoped that this can be done in the near future.

Bids were obtained on Project C-164, Residential Parking Areas, but A.E.C. requested that this project be reviewed again due to changing conditions since the original study was made. This review will be made by Design and Construction and will undoubtedly require new bids after it has been reworked.

ORGANIZATION & PERSONNEL

Number of employees on payroll:	Exempt	Non-exempt	Total
April 30, 1948	36	334	370
May 31, 1948	36	335	371
Net increase			1

During the month of May the following personnel changes were made:

New employees	7
Transfers - To Maint. Division	1
Terminations	5

ENGINEERING SECTION

General

The normal duties of inspection, scheduling and follow-up consultation and general planning were performed during the month. Priority schedules were set up with the Community Maintenance and Labor Sections, and Transportation Division, outlining the work to be performed in the order most advantageous to the over-all Community Maintenance. Contacts with members of the Construction Group were continued relative to Richland houses, facilities, and dormitories. Performed the necessary liaison work with Design Division, where we were designated as the Contact Engineer.

1223680

Community Divisions

ENGINEERING SECTION (Continued)

Tenant Service

The processing of patrol orders and work orders during the month is as follows:

	Incomplete 4-30-48	Issued During May 1948	Incomplete 5-31-48	Issued Prev. Month
Patrol orders - days	1404	3350	1358	3607
Patrol (off shift elect.)	0	600	0	0
Patrol (off shift Maint.)	14	241	13	317
Regular work orders	441	82	414	112
Backcharge tenant service orders	43	74	57	109
Routine Work requests	37	10	57	37

The tabulation of house renovations by types for the month is as follows:

Tract	A	B	D	E	F	G	H	L	Prefabs	Apartments	Total
0	23	10	0	2	3	0	9	0	45	1	93

During the month project forces painted the interior of 90 conventional type dwellings.

Items of Interest

239 permits for grass seed were issued to tenants during the month, which amounted to 8869½ pounds of seed.

Scrap lumber permits issued to tenants during the month amounted to 219 as compared with 658 issued the previous month.

Home fire inspections for the month amounted to 335. (652 homes were visited and 335 were inspected.)

Requests for bathroom painting outstanding amounted to 104 as compared with 103 the previous month.

Window glass replacement (all types) requests outstanding amounted to 128.

To date the balance of "T" type clothes poles have not been installed in the precut type homes. This has caused many extra calls on Tenant Service phones. The work authority for this work is in the hands of the design division.

Sink linoleum requests for replacements amount to 187 outstanding as compared to 292 the previous month.

Requests for maintenance repair or replacement of 209 kitchen faucets are still outstanding. Many replacements are due to recent linoleum repairs.

1223681

Community Divisions

ENGINEERING SECTION (Continued)

During the first two weeks of the month miscellaneous tenant service inspection on lot lines, bathroom linoleum replacements, basement excavations, and alteration permits averaged around 20 daily. Due to a recent organization change the Tenant Service inspectors are now reporting to A. I. Moore, who is in charge of inspection.

Electrical outage notifications received and handled during the month amounted to eleven.

Alteration permits issued to tenants during the month of May, 1948, amounted to 266, as compared with 176 issued during the month of April. Permits issued during the month of May consisted of the following:

Basement excavations	12
Sanding & Refinishing floors	16
Automatic washer installations	19
Air conditioner installations on windows & furnaces	213
Install rear door in 3-bedroom prefab	1
Install French windows on sun porch (M type house)	1
Install partition (sheet rock) in basement	1
Install additional window in basement	1
Install tile wallboard around bathroom shower stall	1
Install overload switch on air conditioner	1
Total alteration permits issued during May	266
Daily average of permits issued in May	13

Field Engineering

Drawings and specifications were approved for the following building alterations:

a. Recreation Hall Vestibule

Proposal approvals were given to the following facilities for building improvements:

a. Jewelry Store in building 92-X
b. Diamond 5 and 10¢ store

The following drawings and specifications are being reviewed for approval:

a. Signal Service Station, North Richland
b. Snack Bar, North Richland.

19 back charge estimates and nine informational estimates for the Commercial Facilities Division and Community Activities Division were prepared during the month.

Assistance was furnished to groups of the Public Works Division in the obtaining of materials and equipment and also maintaining the necessary control records.

206

1223682

Community Divisions

ENGINEERING SECTION (Continued)

Facility Sponsored Construction at Richland and North Richland approximates the following schedule:

Facility	Construction Started	Status % Complete	Estimated Completion Date
North Richland			
Phillips "66" Service Station	May 27,1948	3	July 15, 1948
Food Store	May 3, 1948	40	July 1, 1948
Drug Store	May 3, 1948	50	June 30, 1948
Clothing Store	April 26, 1948	60	July 3, 1948
Richland			
Thrifty Drug Modernization	March 1, 1948	100	
T.Q. Dining Room Modernization	April 19, 1948	100	
Campbell's Food Lockers	Dec. 15, 1947	80	July 1, 1948

Regular field inspections are being made in compliance with building permit requirements.

Inspection

Inspection and acceptance of new houses is as follows:

	Previously accepted	Accepted During May	Total
U & V type precuts	282	134	416
M Q R S type conventional	87	105	192

Tract Houses, remodeling - May 1948

House No.	Work Order Issued	% Completed	Completed
K-784	2-23-48	100	5-6-48
K-789	3-15-48	90	
L-859	4-15-48	0	
K-780	4-14-48	0	
0-1246	4- 9-48	0	
0-1247	4- 9-48	0	
K-734	5-13-48	75	
K-772	5-18-48	0	
L-895	5-10-48	0	
0-1205	5-21-48	0	
L-883	5-19-48	100	5-25-48
L-903	5- 7-48	100	5-16-48
L-898	5-18-48	100	5-22-48
2000-X	5-19-48	100	5-26-48

All exceptions on the temporary fuel oil storage tanks and men's dormitories were cleared and the facilities accepted.

Community Divisions

ENGINEERING SECTION (CONTINUED)

51 alteration permit inspections were completed during the month.
236 miscellaneous inspections were made during the month.

Personnel:

Number of employees on payroll at beginning of month	17
" " " " " " end " "	17

MAINTENANCE SECTION

Personnel

Number of employees on payroll:	Exempt	Non-exempt	Total
April 30, 1948	17	201	218
May 31, 1948	17	197	214

During the month the following personnel changes were made;

New Employees:	1 Carpenter
	1 Carpenter Helper
	1 Electrician's Helper
Transfers:	To Maint Division - 1 Mechanic-Mwt.
Terminations:	3 Painters
	1 Laborer (Renovations)
Sick Leave	2 Carpenters

Safety

There have been no major or sub-major or near serious injuries during the month.

On Friday, May 28, at 8 AM all mechanics who are working on Dormitory air conditioning project No. C-242 were called into a special meeting to discuss hazards on that particular job. Emphasis was placed on the necessity for extreme caution to prevent falls. The need for good and continual housekeeping was also stressed.

There were no major equipment failures during the month.

Progress

During May 94 housing units were renovated. 33 orders are on hand, all of which are in process as of the end of the month. Work on renovations is continuing although these same houses are presently being held by the housing office for residents who may want to move from their present housing location near the dike area.

The reconditioning of dormitory W-21 is complete and building is ready for occupancy. Installation of the desert cooler is approximately 98% complete and will not be finished until the damper controls, being assembled by a contractor, are returned.

MAINTENANCE SECTION (Continued)

The inside of 87 conventional type units were painted during the month. This type of work decreased due to the transfer of manpower to perform house renovations and to do painting in connection with the dormitory air conditioning job.

The installation of air conditioning in the Richland Theater, project C-194, as originally called for on the project was not completely satisfactory and some alterations have been necessary. The air conditioning system as designed was too noisy to be operated and interferred with the movie sound audibility. It was necessary to sound proof by placing the conditioner units on two inches of cork and in padding portions of the interior ducts with the sound proofing felt material. At the request of project group engineers, the speed of the fans was decreased. As a result insufficient air is distributed to the project room and it will still be necessary to provide some arrangement for correcting this condition.

Linoleum was replaced on 239 kitchen sink tops during the month of May.

The installation of mail boxes in dormitories, project C-242, is being done in conjunction with project C-194, dormitory air conditioning, which arrangement makes the installation more economical. All mail box assemblies have not yet been received.

The metal hutment adjoining the Municipal building, previously used by the firemen, was remodeled into offices for use by the Community Engineering groups.

The B-type house at 402 Douglas, which was damaged by fire, has been completely repaired.

The remodeling of tract house K-789 was completed during the month.

Carpenter crews are continuing to repair the exteriors of permanent type houses in the south end of town. Work is 50% complete in division seven, 50% complete in division five and 15% complete in division four.

A new gate house was built at the labor yard during the month.

Project C-158, dormitory air conditioning, which had originally been started by Minor Construction, and for which consideration had been given to contracting, was taken over by the Community Maintenance group on May 19. At the time of starting this work it had been estimated that 30% of the work had been completed. Approximately 10% in addition to that has been completed during the balance of the month. Sheetmetal contractors have been called in to bid on those portions of the sheetmetal work which can be done off of the job. This was done in order to reduce the number of sheetmetal hours to be done by project forces on the job since there are only a relatively few mechanics available with that background.

1223685

Community Divisions

MAINTENANCE SECTION (Continued)

Remarks

It is planned that studies shall be made to increase efficiencies and economies of the Village Maintenance Section. Functions of this group requiring this attention include:

Streamlining tenant service patrol order procedures and records as applied to the field.

Establishing work order procedure for use and to be adapted to needs of the Community organization.

Time study approach to various field operations.

Establishing procedure to accurately determine work backlogs.

Establish an improved method of keeping records on tools, equipment, routing inspections and preventive maintenance performed.

LABOR SECTION

Personnel

Number of Employees on Payroll:	Exempt	Non-Exempt	Total
April 30, 1948	12	123	135
May 31, 1948	12	126	138
Net increase		3	3

During May the following personnel changes were made:

New Employees	4
Terminations	1

General

Project C-135 -
Landscaping around the Drug Centers is approximately 50% complete Maintenance work in Village Nursery #2 progressed satisfactorily during the month.

A new garbage disposal area was put into service. This new area is located on the West end of Saint Road.

A total of 241 electric ranges and 246 refrigerators were delivered to project homes.

21 moves of personal furniture were completed during the month.

1223b8b

Community Divisions

LABOR SECTION (COntinued)

General

Fuel Deliveries:

Coal on hand beginning 5-1-48	2,095,500
Coal received during May	12,161,900
Transferred to other areas	8,852,900
Consumed in Village	1,290,000
On hand June 1, 1948	4,114,500

Fuel Oil Movement

On hand 5-1-48	None
Received during May	60,670 Gals.
Delivered during May	45,689 "
Gals on hand end of period	17,981 "

Grass seed mixed during the month	13,430 lbs.
Grass seed dispersed during the month	8,430 "

Mowing and irrigation of public areas has progressed very well considering the shortage of labor at this time. The crew consists of approximately 24 men. The weather has, with the exception of a few days, been favorable, but some areas are beginning to burn for lack of water.

Four Worthington Gang mowers have been in use part time, also four Moto-Mowers and one Cycle-Bar mower.

The irrigation farm lines and ditches are being patrolled by one foreman and three men. There is still considerable patching to be done on damaged lines. There is considerable growth in the ditches at this time. Chemicals will be used to kill this growth as soon as the water is back in the ditches.

1223687

HEALTH INSTRUMENT DIVISION

MAY 1948

Organization

The composition and distribution of the force as of 5/28/48 was as follows:

	100-B	100-D	100-F	200-W	200-E	300	700	P.G.	Total
Supervisors	0	1	3	9	3	14	6	0	36
Engineers	1	5	7	11	17	7	0	0	48
Clerical	0	0	0	1	0	2	4	0	7
Others	0	14	14	57	28	45	7	18	183
Total	1	20	24	78	48	68	17	18	274

Number of Employees on Payroll	May
Beginning of Month	268
End of Month	274
Net Increase	6

The net increase is equal to the staff of the Meteorology Group, which was taken over from the S Division. There was an addition of a helper and laborer for the still expanding personnel meters program, and an inspector, helper and laboratorian for the Site Survey group, which remains understaffed. These additions were offset by transfer of an assistant chief supervisor to the S Division, and by removal from the roll of an engineer, two inspectors, and one laborer.

General

The deposition of active particles during the month followed an erratic pattern, with no apparent correlation with wind direction. It became impossible to define any region of the 200 West or East Areas as unequivocally safe against a particle inhalation hazard. However, there is growing evidence that all particles of significant activity are too large to be fixed in the lung. Collected particles have generally a diameter of about 50 microns, and none has been found below 20 microns. It has become probable that the true radiation hazard from inhalation of the particles is negligible or at least below other normally accepted industrial risks. Consequently, it appears proper to continue both Operations and Construction work in the areas. Nevertheless, the utmost efforts to remove particulate contamination at source are required to insure absolute safety from hazard.

Three Class I Special Hazards incidents occurred during the month. The first was concerned with dummy slug sorting in a Pile Area, the second with beta ray exposure of 515 mrep in a week in Metal Fabrication, and the third with alpha particle contamination of

1223688

personnel handling a polonium - berylluim neutron source in the H. I. Calibration Building.

There was no other high exposure in the routine pencil and badge program.

1223689

Health Instrument Division

OPERATIONAL SECTION

100 Areas

Work Permit Summary

	April	May	1948 To Date
100-B	111	174	632
100-D	921	739	4224
100-F	939	874	4749
Total	1971	1787	9605

Retention Basin Effluent

The activity of the water leaving the Retention Basins was as follows:

	100-D	100-F
Power level	275	275
Average beta dosage-rate (mrep/hr)	0.9	0.8
Average gamma dosage-rate (mr/hr)	1.7	1.9
Average total dosage-rate (mrep/hr)	2.6	2.7
Average integrated dose in 24 hrs. (mrep)	62	65
Maximum integrated dose in 24 hrs. (mrep)	72	67
Maximum integrated dose in 24 hrs. (mrep) 1948	77	84

A large water leak was observed in the north wall of the 100-D Retention Basin during the extended shutdown but was considerably reduced in size after startup. The chemical treatment to the north side of this basin caused much of the algae to scale off of the walls of the basin. The scale settled to the bottom of the basin and no appreciable amount was discharged into the flume.

100-B Area

Extensive maintenance work to the 100-B Pile involved moderate exposure levels in the inner rod room and at the burial grounds. Special tests in process tube 4570 were completed without incident.

100-D Area

Radiation exposure of 30 mr as recorded by "pencils" and 60 mr by the badge occurred to one operator during the routine sorting of dummy slugs. The exposure occurred when several slugs, reading about 2 roentgens per hour at 18 inches were recovered and placed in a box a short distance from the operator. The incident was investigated as Special Hazards Incident #82.

1223690

Health Instrument Division

High dosage-rates were encountered at neoprene seals after the extended shutdown because of impurities in the pile atmosphere. Readings at the top far neoprene seal reached a high of 900 mr/hr at 2 inches. Background readings at the 0 foot level on the far side of the charge elevator were as high as 7 mr/hr. The pile atmosphere is currently operating at a maximum of 25% CO_2.

Gas leaks at the base of the pile were observed to cause changes in background on the experimental level, the charge elevator pit, the sump tunnel, the accumulator room, the instrument shop, and the work area corridor. Gas leaks in the inner instrument room accounted for dosage-rates up to 500 mrep/hr.

Continued gas surveys inside the V.S.R. enclosure showed active gas present under the bumper plates of rods 23 and 36. Soap tests during shutdown confirmed these leaks and they were sealed. However, due to several "scrams" since shutdown the air activity was high and it was not possible to determine if these leaks were the cause of the periodic increases in exhaust air activity.

Surveys in the beam emerging from the opening in the biological shield have fluctuated over wide ranges. Film exposures in the beam at the neoprene seal showed readings from 265 to 390 mr/hr. Neutron readings have also fluctuated, indicating a possible influence of horizontal rod configuration. Accurate measurements were not possible because of the high background from the trapped gas behind the neoprene seal.

A high exposure rate was observed on the front face of the pile when the steel dummy train in the gas-filled tube 3574 was removed. Investigation disclosed that the special thermocouple in this tube was attached to the last steel piece and was responsible for the high activity. It was discharged from the rear face without further incident or exposure to personnel.

Graphite samples were removed from special gas-filled process tubes, with the chief hazard that of contamination. An active, previously exposed special request sample was loaded into tube 1769 without significant exposure to personnel.

A one inch iron plate was installed over the new opening in the brick separating the top of the pile from the discharge area. No radiation effects were detected after the cork was removed from the wall separating the far side from the discharge area.

100-F Area

During regular discharge operations process tube 0865 became jammed and had to be discharged by special procedures. One active piece became lodged on the tip-off in the discharge area and was removed by a thin

spline from the inlet end of the tube. A survey made in the discharge area while the piece was exposed on the tip-off indicated an exposure rate of 7.5 roentgens per hour at the near side of the 20 foot level catwalk. During the removal of dummy pieces from the front end of this tube, personnel were exposed briefly to a field of 3.5 roentgens per hour. Personnel exposures did not exceed 50 mr.

Two other process tubes were replaced, several empty tubes were opened for inspection and one tube was borescoped without incident.

An accumulation of rust in the bottom of several vertical rod thimbles caused some interference in the operation of the vertical rods. Maintenance began the removal of this rust by means of a suction arrangement which trapped the rust in a water seal. Large exposure rates were encountered during this work and time limits were correspondingly short. The maximum activity reported was 4 roentgens per hour at 1 foot from the water seal. A decay study on the rust showed the half-life to be greater than 30 days.

Technical Division personnel made several irradiations in the experimental holes which resulted in some spread of contamination. General hazards were well controlled, however, and no personal contamination was encountered. One sample of chromium encased in aluminum read 66 rep per hour including 1.5 roentgens per hour at 2 inches when removed from the loading cask.

A test hole was dug to the top of the Pile Building effluent line at a point 13 feet from the west side of the Miscellaneous Storage Building. Later a large portion of this line was exposed just south of the cushion chamber. The exposed line gave a dosage-rate of 260 mr/hr at 2 inches. A leak in the line resulted in widespread contamination to the surrounding soil and excavated dirt was buried in a special trench just outside of the exclusion area.

1223692

Health Instrument Division

200 Areas, T and B Plants

General Statistics

	April			May			1948
	T	B	Total	T	B	Total	To Date
Special Work Permits	376	433	809	283	359	642	3567
Routine & Special Surveys	295	299	594	215	291	506	2967
Air Monitoring Samples	282	545	827	309	503	812	4269
Thyroid Checks	162	116	278	159	105	264	1673

Canyon Buildings

Significant air contamination occurred in the T Plant when cells were opened for inspection and connector installation. Maximum concentrations reported were 8.8×10^{-6} μc f.p./liter and 4.5×10^{-11} μg Pu/cc. The canyon was closed to personnel entry during these periods.

In the B Plant, thirteen cell air filters were replaced with new units and radiation measurements obtained on six of the filters removed. One removed from 13L after exposure to four process runs showed a Betty Snoop reading of 70 rep per hour including 50 roentgens per hour at 2 inches, and 4 roentgens per hour at three feet. Seven others were removed and placed in a burial box on a flatcar. Dosage-rates of 50 mr/hr at the deck above the flatcar and 130 mr/hr at the end of car (about 20 feet) were recorded. After this removal work, spots of brown syrupy liquid were noted on the protective paper on the canyon deck, with a surface dosage-rate of 20 rep per hour and 800 mr/hr at 2 inches reported. The paper was removed.

For the first time significant canyon air contamination occurred coincidentally with fan shutdown in connection with fan replacement work. One and one-half hours after the fans were started up, the #3 fan inlet and outlet holes plugged, an air sample taken at Section 13 showed 1.1×10^{-6} μc f.p./liter and 1.5×10^{-11} μg Pu/cc. Two days later while the newly fabricated #3 fan ducts were installed an air sample at Section 17 was too "hot" to count and showed a surface dosage-rate of 50 mrep/hr; product concentration was 2.8×10^{-11} μg/cc. One hour after the fans were again in operation a concentration of 1.1×10^{-4} μc f.p./liter was obtained and 3 hours later 6.4×10^{-6} μc f.p./liter. An air sample taken in the Operating Gallery during the fan shutdown showed 1×10^{-6} μc f.p./liter, later samples were normal.

Cell 15R was opened the same day as the first fan shutdown, but after the fans were again in operation, and an air result of 9×10^{-6} μc f.p./liter obtained. One hour after the cell was closed a result of 5.3×10^{-6} μc f.p./liter was reported and 3 hours later 8×10^{-7} μc f.p./liter.

1223693

Four canyon air samples showed significant concentrations without a known cause.

Control Laboratories

In the B Plant, 353 items, not regulated with respect to handling, were found contaminated on surveys by Technical and H. I. personnel. In addition, 46 contaminated floor locations were reported.

Forty-two cases of hand contamination were reported, and all were successfully reduced. Cause for this marked increase in hand contamination was attributed to new personnel by the Technical Division.

Concentration Buildings

In the T Plant, maintenance work was done in the F-10 enclosure, and skimmers replaced in the D-2 centrifuge in the presence of high level product contamination, but no spread of contamination or personnel contamination occurred. A leaking flange caused general contamination of the B-3 tank top. Repairs and cleanup were completed without further spread of contamination.

In the B Plant, a filter was installed in the E cell vent line. After one day of use, a leak in the filter housing was noted, and the filter was removed. Two special air samples were made by H. I. of air in this line and showed an average of 3.7×10^{-9} µg Pu/cc during centrifuging in E-2. Two contaminated personal shoes were encountered with alpha readings of 35000 d/m, and 3000 d/m reported. Decontamination was effective in the second case, and the other discarded when decontamination failed.

Stack Areas

In the B Plant, the inlet and outlet ducts of the #3 fan were replaced with stainless steel ducts. The maximum exposure rate during this work was 500 mrep/hr. A general rust deposition on the interior fan surfaces was visible, and soggy masses of rust in the bottom of the housing were scraped out and buried.

Waste Disposal Areas

In the T Plant, installation of a jumper in the 153 diversion box was done in an exposure rate of 750 mr/hr around the top of the box with correspondingly short time limits.

Excavation work for new waste lines has required short time limits when in proximity to current waste lines, as exposure rates have been as high as 1 roentgen per hour.

1223694

Health Instrument Division

North Areas

Work was continued by Technical Division personnel at 212-U on etching and photographing wafers previously cut from an irradiated slug. Acid etching baths became quite active with a maximum dosage-rate of 6 rep per hour at one foot reported. One acid bath leaked and caused table contamination of 10 rep per hour at 2 inches and ground contamination of 1 rep per hour. Contaminated equipment was removed to the burial ground and removal of contaminated ground is in progress. Exposure rates during cleanup work have been up to 300 mrep/hr, with one period of exposure of short duration at 2200 mrep/hr.

General

All thyroid checks were below the conservative warning level.

In the T Plant, 5857 Martindale filters were surveyed with a G.M. probe and no contamination was detected. Radioautographs were made on 4392 filters, and results completed indicated 186 particles on 2328 filters.

In the B Plant, 7167 Martindale filters were surveyed with a G.M. probe, and contamination was detected on two filters which showed levels of about 80 and 150 c/m. Radioautograph results were completed for 5904 filters. Initial filming showed 577 particles, and refilming showed 566 particles, of which 377 were verifications as to position on the plate.

The Isolation Building

Air Monitoring

There were 228 spot air samples taken, of which seven were above 10^{-11} µg Pu/cc. Six of these were taken during S.W.P. and sampling work in the process areas when masks were worn and showed a maximum of 4.5×10^{-10} µg Pu/cc. One sample taken in Cell 3 during normal operations showed 6.8×10^{-11} µg Pu/cc.

Forty-six of the 48 Little Sucker samples, run continuously by shifts, were below 4×10^{-12} µg Pu/cc. One laboratory sample showed 4.1×10^{-12} µg Pu/cc and a sample in Cell 3 showed 6.1×10^{-12} µg Pu/cc, both positive samples were for the 12 - 8 shift covering the period 5/15 through 5/21.

Thirteen samples of the 903 exhaust system air had as the high result 5.6×10^{-12} µg Pu/cc, which was obtained at the time of the spill in the Cell 3 greenhouse.

Forty-two special samples were taken in connection with filter media breakdown tests.

1223695

Health Instrument Division

Surface Contamination

A total of 170 items, not regulated with respect to handling, was found contaminated on surveys by Technical, H. I., and "S" Division personnel. Four items above 20000 d/m, and one item above 80000 d/m were reported. In addition, 50 contaminated floor locations were reported. There were ten instances of hand contamination, of which eight were low level, and the other two cases involved about 0.2 and 0.3 μg Pu respectively, all of which were successfully reduced.

A small leak on the outlet line of the AT tank of Cell 3 allowed a process batch drain out onto the greenhouse floor. The charge was recovered. The contamination was contained within the greenhouse and the tank was replaced without incident.

Gamma Radiation

P. R. Container	11½ mr/hr (maximum)
Process Hood	2½ mr/hr (maximum)
S. C.	5 mr/hr (maximum)

The 300 Area

General Statistics

	April	May	1948 To Date
Special Work Permits	232	299	1334
Routine and Special Surveys	153	120	785
Air Filter Samples	92	88	579

Metal Fabrication Plant

Fifteen of 39 air samples taken were above the tolerance concentration as summarized below:

Location	No. Taken	No. Above 1.5×10^{-4} ug U/cc	Maximum Concentration ug U/cc
Extruder Building	3	3	*1.1×10^{-3}
Chip Recovery	22	2	**3.7×10^{-4}
Oxide Burner	6	4	***1.2×10^{-2}
Melt Plant	6	6	#6.2×10^{-4}
Machining Room	2	0	---

*At rod straightener
**At briskette press
***At operators position
#At "B" furnace with lid off after loading

1223b9b

Health Instrument Division

A preliminary film study on the hands of operators weighing uranium in the Extruder Building indicated a possible need to further limit the time spent on this operation. After an increase in the size of the crew and a change in procedure to reduce the actual handling of the metal, the need of further restrictions was obviated.

P Division provided plant shoes for the following operations: Melt Plant, Chip Recovery, Machining, Material Handling, and personnel assigned in the Extruder Building.

Following reports that process metal slugs were contaminated upon arrival in the 100 Areas, smear samples were taken on several slugs after removal from the autoclaves. A maximum reading of 4000 d/m was obtained.

Air samples taken in Rooms 8 and 33 in the Laboratory Building showed less than tolerance concentration.

Test Pile Building

A film study on the hands of stringer operators in this building showed that the two-hour time limit allowed for this job is quite satisfactory.

Well Contamination

Samples taken from the #4 Well during the high water conditions showed 3×10^3 µg U/liter and required that this well be taken off the line. Other wells showed increased contamination.

Technical Building

All air filter samples taken in the 3706 Building and 321 Building were below 2×10^{-11} µg Pu/cc. Eight samples were between 2×10^{-6} and 4×10^{-5} µg U/cc.

The chemical research group continued product work under excellent contamination control. During the preparation of a Zr tracer moderate exposure rates were encountered but no overexposure to personnel resulted.

Two persons became contaminated when they removed a cap to a neutron source shield and handled the remote control string attachment. The contaminant was an alpha emitter and probably polonium. The contamination was successfully removed from the hands but one man's suit and raincoat were confiscated for decontamination at the plant Laundry.

1223697

Health Instrument Division

Laundry Decontamination and Hand Counting

A total of 125,371 items was monitored in the Plant Laundry, including 48,612 alpha checks. There were 28,093 coveralls, 40,414 gloves, 35,586 overshoes, and 4,228 slacks and jackets, included.

Seventy-eight spot and seventy-eight Big Sucker air samples were taken during laundry operations The maximum concentration of 1.7 x 10^{-10} µg Pu/cc was obtained during the washing of 300 area clothing.

There were 33,793 alpha hand checks, and 47,126 beta hand checks recorded. About 0.21% of the alpha and about 0.51% of the beta checks were above the warning level.

As in the past most of the high hand scores were recorded in the 300 Area where uranium was the contaminant. No attempt at reduction was made in 10 of the high alpha scores and 120 of the high beta scores recorded. The record showed decontamination attempts failed in two cases of alpha and 11 cases of beta contamination; all in the 300 Area.

Plant General

A skip distance effect of particle deposition in the 200 West Area required rather quick and extensive surveys in the 241-TX Construction Area in order to know the effects there. Results showed the skip effect to be real but to miss the construction work area. However, results indicated a deposition of from 2 to 6 particles per square foot per week about 200 yards from the construction area fence.

Air filter samples taken in Benton City and Riverland picked up active particles. Expressed as particles breathed results showed 1 particle breathed per 17 weeks at Benton City, and about 1 particle breathed per 12 weeks at Riverland.

Shiftwise air samples taken at the Meteorological Tower in attempts to correlate deposition with process activities varied from 1 particle per 55 cubic feet to 1 particle per 900 cubic feet. The only correlation found was that deposition rate was affected by wind direction. However, the high rate occurred when rusty connectors were impacted in the "T" Plant.

Health Instrument Division

PERSONNEL METERS

Pencils	100-B 100-D	100-F	E&N 200	200-W	300	Total	1948 To Date
Total Pencils read	10,769	13,625	27,883	40,368	36,988	129,633	633,400
No. single readings (100 to 280 mr)	32	67	46	102	161	408	2,179
No. paired readings (100 to 280 mr)	1	0	1	1	1	4	18
No. single readings (Over 280 mr)	97	163	93	126	373	852	3,528
No. paired readings (Over 280 mr)	0	2	0	1	1	4	45
Paired readings lost	1	0	1	2	0	4	24

No significant pencil result was confirmed by the badge result. Investigation of lost readings disclosed no possiblity of an overexposure.

Badge Resume, Construction Areas

	105-DR	241-TX	384	Total	1948 To Date
Badges Processed	8,887	6,415	448	15,750	65,739
No. of readings (100 to 500 mrep)	23	19	10	52	91
No. of readings (Over 500 mrep)	0	14	5	19	48
Lost Readings	1	1	0	2	43

Readings of over 500 mrep in the TX Area were for a two-week period and were due to the use of X-Ray in the field. Three of these results were above 1 roentgen.

Lost readings were both due to lost badges.

Badges	100-B	100-D	100-F	200-E	R.R.T 200-N	200-W	300	Total
Badges Processed	1,978	2,055	3,346	2,382	292	3,153	6,518	19,724
No. of readings (100 to 500 mrep)	0	3	7	4	4	6	233	257
No. of readings (Over 500 mrep)	0	0	0	0	0	0	2	2
Lost Readings	0	0	1	0	0	3	1	5

Total 1948 Badges to date were 124,525

1223699

Health Instrument Division

Lost readings were accounted for as follows:

Light Leak	2
Badge dropped in water	1
Badge lost in area	1
Recovered lost badge, impossible to read	1

One result above 500 mrep was due to a contaminated badge and the other result, 515 mrep, was investigated as a Class I incident.

In addition 1,185 items of non-routine nature were processed, 1948 total to date 5,502.

1223700

Health Instrument Division

CONTROL AND DEVELOPMENT SECTION

Water Monitoring

Three hundred and fifty-five samples of drinking water were taken during the month. The maximum alpha contamination of 340 dis/min/liter was found by ether extraction of a 7.7 liter sample of 300 Area Well #4. The other 300 Area wells are showing the expected increase with the rise of the river. These wells show maximum values of 15-30 dis/min/liter from direct counts on residue and 90-170 dis/min/liter from ether extractions of 500 ml samples. Trace amounts of 2.0-2.5 dis/min/liter were found in one sample from each of three Richland wells and Benton City. These values were not confirmed by later samples. No sample of drinking water gave a value of beta activity as high as 5×10^{-5} μc/liter.

Fifteen test well samples were taken with no detectable alpha or beta contamination.

Sixty-eight samples of Columbia River water were taken with one sample from 181-D and 181-F showing trace amounts of 2 dis/min/liter of alpha activity. These values were not confirmed by later samples. The maximum beta reading was 5×10^{-4} μc/liter from a Hanford sample. Thirteen samples of Yakima River water were taken with no positive result for either alpha or beta activity.

Atmospheric Monitoring

The integrons and "C" Chambers indicated average dosage-rates as follows:

Location	Integrons (mrep/24 hours)		C Chambers (mrep/24 hours)	
	April	May	April	May
100-B	0.1	0.1	0.3	0.3
100-D	0.2	0.2	0.3	0.3
100-F	0.8	0.6	0.3	0.3
200-W	0.2	0.4	0.3	0.3
200-E	0.9	1.0	0.9	0.5
Riverland	1.3	2.0	---	---
Hanford	1.1	0.6	---	---
300 Area	1.2	1.0	0.4	0.5
700 Area	0.1	0.1	---	---
Kennewick	0.2	0.1	---	---
Pasco	0.1	0.2	---	---
Benton City	0.3	0.8	---	---

Detachable Chamber readings in Hanford, TX, DR, and White Bluffs were 0.78, 0.70, 0.82, and 0.74 mrep per 24 hours respectively. The maximum eight hour reading on a CI unit was 2.6×10^{-7} μc/liter at Gable Mountain.

1223701

The highest average concentration for the month was 9×10^{-10} μc/liter at the 300 Area. One hundred and thirty-one rain samples were collected. The maximum rain sample was 0.03 from the 200 West Area. The maximum off-area sample was 1.3×10^{-4} μc/liter from Riverland.

Land and Vegetation Contamination

A slight decrease was noted in the vegetation contamination.

Location	Average for April	μc I^{131} per kg. May	
		Maximum	Average
North of 200 Areas	0.04	0.09	0.04
Near the 200 Areas	0.17	1.30	0.08
South of 200 Areas	0.05	0.37	0.04
Richland	0.04	0.08	0.04
Pasco	0.04	0.08	0.04
Kennewick	0.05	0.07	0.04
Benton City	0.04	0.04	0.04
Richland "Y"	0.06	0.09	0.04
Hanford	0.04	0.08	0.04

Seventy samples were collected from the Benton Gap. The maximum value was 0.18 μc/kg from the 1950 foot level. Twenty-six samples were collected from the vicinity of Goose Egg Hill. The maximum value was 1.4 μc/kg while the average was 0.16 μc/kg. Forty samples were obtained from Rattlesnake Mountain. The maximum value was 0.13 μc/kg with an average of 0.04 μc/kg.

Geology

Wells #361-B-1, 3 and 4 continue to give positive indications of beta activity in samples from the water table. The maximum level is in the 361-B-1 well which had about 4.0×10^{-3} μc/liter. This well also had the highest alpha activity at about 120 dis/min/liter. Wells 361-B-9, 10 and 11 were completed to the water table. The first of these wells was only about 20 feet from the 361-B drywell but contamination levels were very low the maximum being only about 6×10^{-5} μc/liter. The other two wells were located 5000 feet from the drywell and only one sample was obtained from them and it was uncontaminated. A special three gallon water sample from 361-B-1 was analyzed for fission products with the following results:

Element	Activity (μc/liter)
Ru	1.84×10^{-3}
Zr	1.7×10^{-4}
Y	5.4×10^{-5}
Other rare earths	2.9×10^{-5}

1223702

Health Instrument Division

Element	Activity (uc/liter)
Sr	8.0×10^{-6}
Co	8.0×10^{-6}
Cs	not detected

Samples of liquid obtained from the laterals of the shaft in the 241-B Area average about 0.4 μc/liter. There is no significant difference between the two levels. Samples of the liquid in the crib have had from 0.6 to 1.2 μc/liter.

No significant contamination was found in a sediment taken about 20 feet below the 241-T #3 crib. The two wells which were reported flooded last month still have active water. A sample from 241-T-2 had 6.2×10^{-5} μc/liter while one from 241-T-5 had 0.56 μc/liter. Both of these samples had alpha activity of about 100 dis/min/liter.

Five of the water table observation wells have been started and are now at depths ranging from 10 to 100 feet.

The modified sampler has been successful in obtaining two samples of soil but needs to have some further revision to get somewhat larger samples. It has not yet been used in a contaminated well.

Meteorology

This first month for the Meteorology Group in the H. I. Division has produced several records. It was the wettest May on record with 1.71 inches; the next highest was 1.56 inches in 1934. All wind velocity records for the Tower were broken on May 26 when the following velocities were recorded:

Surface	54 MPH
50 feet	71
150 feet	84
200 feet	82
400 feet	80

The average temperature was 3.2°F below the average for the past 18 years at Hanford and 10.4°F below the average for last year. Fog occurred twice during the month which is quite unusual.

Dilution figures were as follows:

Shift	< 500	500 to 1000	> 1000	Aloft
12 - 8	11%	17%	26%	46%
8 - 4	61%	25%	14%	0%
4 - 12	7%	25%	43%	25%
	26%	22%	28%	24%

1223703

Health Instrument Division

Bioassay

Four hundred and ninety samples were analyzed for plutonium. Eight resamples were necessary; six because of a low spike value and two because of high results. All but two of the resamples from last month have been completed and found to fall below the detection limit.

Forty-five urine samples, ninety-seven water samples, and twenty-three Hexone samples were analyzed on the fluorophotometer. Three of the urine samples were greater than 10 ug/liter. The new fluorophotometer has been tested and found to have about the same sensitivity as the old one.

Biological Monitoring

A pilot experiment is in progress to test experimental procedures for use on the Animal Farm. Ten uc of I^{131} are being fed to a sheep every day and checks are being made on the thyroid and on urine and feces samples. To date a total of 210 uc has been given and the only observable effect other than the radioactivity level which has been noticed is that the sheep seems to have a very sensitive thyroid region. Another experiment is to start soon on feeding about 5 uc of I^{131} a day to a rabbit.

Twenty-one young ducks have been successfully hatched. Eight of these are going to the 200-N Area and eight to the 300 Area pond and the others will remain at 100-F.

Fish Laboratory

Studies on the effect of exposing young chinook salmon to concentrations of area effluent water ranging from one part effluent to five parts river water to one part effluent to two-hundred fifty parts river water have been continued. The results have been along the lines of previous trends with some increase in mortality among fish held at dilutions of 1:5 and 1:10. High mortality rates and arrested growth occur among fish held in pre-pile process water, undiluted Retention Basin water and 2.0 p.p.m. dichromate.

The last of the adult rainbow trout which were held in half strength Retention Basin water were spawned and their eggs and young are being held in the laboratory. A comprehensive study of the variable results will be necessary before any conclusions can be drawn.

Under laboratory conditions a strength of 0.2 p.p.m. copper sulfate did not kill Retention Basin algae but did somewhat inhibit new growth and prevent the establishment of animal forms. The Retention Basins in the 100-B and 100-D Areas have been chlorinated with either liquid chlorine or H.T.H. powder. The effectiveness of these treatments is not yet completely determined.

1223704

Health Instrument Division

Due to the extreme high water conditions in the Columbia River it has not been practical to collect field samples. Material which was collected previously is now being worked up in the laboratory.

As a result of operational difficulties with the 100-F Pile, the use of effluent water directly from the Retention Basin has temporarily been discontinued.

Methods Development

At the request of the Technical Division, analyses are being made for $C^{14}O_2$ and $C_{14}O$ in the pile gas during the period immediately after start-up. Only one sample from 100-D is completed at this time. Values of 5×10^{-3} uc/liter as $C^{14}O$ and 8.4×10^{-2} uc/liter as $C^{14}O_2$ were obtained. The relative percentages of gas, however, were 0.2% CO and 23% CO_2 indicating higher specific activity of the CO.

The caustic extraction procedure for determining I^{131} in vegetation appears to be giving acceptable yields around 70% on one gram spiked samples. Some difficulty is experienced in increasing the size of sample due to formation of organic colloids. The application of this procedure to samples obtained from the reservation gives ambiguous results because of the long-lived activity present. Some experiments on fixing iodine on a counting plate indicate that a serious loss of iodine may occur unless sufficient reducing agent is present.

Some scrubber and filter samples are being taken from the 292-T Building in an attempt to measure the efficiency of the filter paper and the activity up the stack. Some difficulty has been encountered with a needle valve blocking from scale from the pipe wall. Most of the activity that passes through the filter paper is caught by an iodine analysis. On the basis of one analysis, the filter paper appears to collect about 25% of the iodine under those conditions.

Instrument Development

The portable poppies seem to have been operating satisfactorily after the coupling condensers were coated with G.E. moisture resistant varnish. A prototype for further production of the instrument is being built.

A prototype of Neut was built for the Instrument Division, the original experimental model operated satisfactorily during the month.

A poppy probe with wires separated one inch and the end wires 3/4 of an inch from the frame gave uniform 0.2 volt pulses and had satisfactory microphonics.

1223705

Health Instrument Division

Physics

Some additional work was done on examining films exposed at the "B" experimental hole in February. Inconsistencies have developed in the calibration films which force a revision of the estimate of precision, previously given as 10%, upward to about 50%. No satisfactory explanation for the inconsistency has been found but variations in results are obtained from different portions of the same film.

The extrapolation chamber is now operating and giving consistent results. First measurements on the dosage-rate on the surface of uranium tend to confirm the value of 280 mrep/hr previously obtained by H. M. Parker.

Calibrations

The routine calibrations were:

RADIUM CALIBRATIONS	Number of Calibrations April	May
Fixed Instruments:		
Gamma	517	539
Portable Instruments:		
Alpha	49	53
Beta	67	80
Gamma	367	389
X-Ray	2	5
Neutron	7	45
Total	492	572
Personnel Meters:		
Beta	1,008	885
Gamma	9,411	8,210
X-Ray	2,231	7,651
Neutron	---	---
Total	12,650	16,746
GRAND TOTAL	13,659	17,857

1223706

Health Instrument Division

SUMMARY

Operational Section

Thr routine surveys showed no major deviation from the established pattern in 2728 Special Work Permits, 626 other surveys, and 1176 air monitor samples. There were two recorded instances of overexposure to beta radiation only, in the film badge and pencil system in 165,107 readings. One of these resulted from contamination; the other was a geniune reading of 515 mrep. there were three additional overexposures to sub-contractor's personnel due solely to their use of x-ray equipment. Three Class I incidents were investigated. No serious exposure was judged to have occurred in any case.

Development of the stack gas active particle problem led in the direction of believing that there is no particle small enough to be inhaled and active enough to be injurious. This is not proven, and does not relieve urgency of correction.

Development Section

Control samples in Site Survey showed no unusual reading, except in a well in 300 Area, which contained enough uranium to prohibit its use for drinking water.

The Meteorology Group, newly transferred to this Division distinguished itself by reporting the wettest May, and the strongest winds on record.

Biological monitoring of animals, birds and fish was continued without special incident.

More emphasis is needed on C^{14} analyses, following the finding of significant concentrations in the Pile gas. The portable proportional counter failure. appears to have been corrected.

MEDICAL DIVISION PERSONNEL SUMMARY

MAY 31, 1948

AREAS	Physicians	Dentists	Nurses	Aides & Orderlies	Technicians	Office Workers	Others
100-B			)			)	
			)			1)	
100-D			4)		2*	)	
			)			)	
100-F			)			)	
			)		2*	)	
200-E			3		2*	2)	
						)	
200-W			3		2* *	)	
300			2		2**	1	
700-1100	16	11	117	49	25	81	62
100-DR			3				
101			1				
White Bluffs			3				
Pasco			1				
3000	8		14	4	9	30	8
Plant General	10		16				
Total	34	11	167	53	36	115	70

Number of employees on payroll:

Beginning of month	462
End of month	486
Net Increase	24

1223708

MEDICAL DIVISION

MAY 1948

General

Employee roll was increased by 24, largely due to the increasing North Richland medical load and the opening of the industrial, public health and outpatient sections of the new medical center. Two physicians and one dentist were added.

There was no evidence of occupational disease or injury as a result of exposure to radiation.

Due to engineering control, the flood waters have produced no sanitary trouble in Richland to date. Frequent checks indicate uncontaminated water and sewage disposal is satisfactory. Several nurses have been loaned to Pasco and Kennewick to aid in innoculating for typhoid because of contaminated drinking water there due to the flood.

Absenteeism due to sickness reached a low figure of 1.31%.

Employee physical examinations dropped from an average daily of 232 to 208. As a result of this drop, we are able to resume annual examinations.

Average daily first aid treatments were 710.

Major injuries dropped from 20 to 13, while submajor injuries increased from 43 to 75. Two of the major and four submajor injuries were suffered by G. E. employees.

Mosquito control was appropriate as the monthly health topic for rising flood waters increase this problem.

Agreement was reached with the State Dept. of Labor that all construction foremen would be given a sixteen hour first aid course by instructors from that department.

Daily clinic visits increased from 235 to 243, while dental treatments remained about constant. The hospital load dropped from 95 to 78 daily.

There was a sharp decline in communicable diseases.

1223709

General Continued

Social welfare services increased chiefly on the basis of referrals from other agencies in respect to construction employees leaving their families in other areas. The workers were also cooperating with the Red Cross Disaster Committee rehabilitating project families effected by flood conditions in this area.

Sanitation services were offered for investigation and analysis of water and sewage in new housing and working areas being opened. This service was also extended to the Emergency Flood Committee in respect to flood conditions experienced to date. Water supply and sewage facilities are functioning properly.

The mosquito work has been continued. However, the impact of the flooded areas has increased this work over and above what was planned.

Dental Division	April 1948	May 1948	Year to date
Patients Treated	2900	2767	13482

1223710

MEDICAL DIVISION

MAY 1948

Plant Medical Division

Physical Examinations	April 1948	May 1948	Year to date
Pre-employment (G. E.)	523	567	2126
Annual	0	13	15
Sub contractors & Food Handlers	4100	1333	17029
Rechecks	651	563	3261
Interval Rechecks (Area)	827	662	4041
Terminations & Transfers	129	960	1436
Army & Government	13	15	83
Assist to A. & H. Ins., Clinic, etc	0	0	0
Total	6243	4113	27991

Laboratory Examinations Clinical Laboratory			
Pre-employment, terminations, transfers	17991	17650	85619
Annual	10	69	93
Rechecks, (Area)	4224	3233	20596
First Aid	14	48	159
Plant Visitors	0	0	12
Clinic	2223	2583	11896
Hospital	3017	2804	14877
Public Health (Inc. food handlers)	735	811	3290
Total	28214	27298	136542

X-Ray			
Pre-employment, terminations, transfers	3158	3085	15423
Annual	0	12	12
First Aid	259	252	1163
Clinic	282	322	1445
Hospital	242	208	1103
Public Health (Inc. food handlers	145	174	888
Total	4086	4053	20034

Electpocardiographs			
Industrial	10	21	39
Clinic	9	12	42
Hospital	16	17	86
Total	35	50	167

Allergy			
Skin Tests	33	9	193

1223711

[illegible] DIVISION

MAY 1948

First Aid Treatments	April 1948	May 1948	Year to date
Occupational Treatments	2547	2953	11560
Occupational Retreatments	7945	9037	35191
Non-Occupational (Welfare) treatments	5505	5735	28277
Total	15997	17725	75028

Absenteeism Investigation Reports

Total number calls requested	13	9	152
Total number calls made	13	9	152
Number absent due to illness in family	0	0	1
Number not at home when call was made	1	0	2

General

With the opening of the Industrial Medical Section at North Richland on May 17th, all construction pre-employment was moved from Kadlec Hospital to this location. On the first day 426 examinations were done. Employment examinations are now being done 5 days a week 8-4 and 4-12 at this location. Pre-employment exams for construction workers dropped from 4,100 in April to 1,333 in May. First aid treatments for all locations remained about the same.
Major and sub-major injuries during May were as follows:

	Major Injuries	Sub-Major Injuries
General Electric	2	4
Atkinson-Jones	11	65
Morrison-Knudsen	0	6

The Health topic for the month of May dealt with Mosquito Control. What each individual could do to aid in the overall program was stressed and this information distributed through out the plant. Annual examinations for G. E. employees were resumed on May 27th. Due to the heavy construction pre-employment load they had been discontinued since Sept. 1947. A representative of the Industrial Medical Section was sent to Olympia during the month to confer with Dept. of Labor representatives in regard to various aspects of the industrial medical program for construction workers. One major item agreed on was a 16 hour first aid course for construction foremen. The instructor will be furnished by the Dept. of Labor for this training.

3

1223712

MEDICAL DIVISION

May 1948

Absenteeism was as follows:

Total absenteeism weekly employees all causes	2.01%
Total absenteeism weekly employees sickness only	1.31%
Total days lost by male employees due to sickness	1015
Total days lost by female employees due to sickness	652
Total days lost due to sickness	1667

The lowest absenteeism was in the Project Engineering Department with 1.46%. The highest absenteeism was in the Accounting Department with 3.50% and in the Medical Department with 3.38%.

Village Medical Division				April 1948	May 1948	Year to date
Clinic Section	Men	Women	Children			
First Visits	734	440	323	1150	1497	6059
Retreatments	2258	3446	328	5916	6032	25950
Total				7066	7529	32009
Clinic Visits						
Medical				1074	1132	5259
Pediatrics				797	863	3563
Surgical				976	772	3962
Gynecological				488	491	2199
Obstetrics (New)				63	88	387
Obstetrics (Recheck)				629	628	3107
Venereal Disease				728	821	3591
Ear, Nose & Throat				304	320	1620
Eye				285	340	1416
Visits handled by nurses (hypo, dressings)				937	1040	3211
Night Clinic Visits				735	1034	3694
Total				7066	7529	32009
Total Clinic visits per day/				235	243	210
Seen in Well-Baby Clinic				191	213	981
Home Visits						
Doctors				256	228	1104
Nurses				237	236	745
Total				493	464	1849

1223713

MEDICAL DIVISION

MAY 1948

Kadlec Hospital Section Census	April 1948	May 1948	Year to date
Admissions	531	447	2484
Discharges:			
Surgical	136	134	600
Medical	87	93	513
Obstetric & Gynecologic	99	84	456
Eye, Ear, Nose & Throat	66	48	354
Pediatrics:			
Children	63	58	289
New born	68	56	287
Total Discharges	519	473	2499
Patient Days	2853	2407	13760
Average Stay	5.3	5.3	5.4
Average Daily Census	95.1	77.6	90.7
Discharged against advice	1	1	10
One Day cases	72	94	393
Operations			
Transfusions	26	25	150
Eye, Ear, Nose & Throat	23	23	141
Dental	1	0	4
Casts	21	20	91
Minors	63	57	302
Majors	63	46	222
Vital Statistics			
Deaths	1	1	15
Deliveries	72	49	283
Stillborn	0	1	3
Physiotherapy Treatments			
Clinic	197	121	648
Hospital	63	25	345
Industrial:			
Plant	552	490	2207
Personal	54	50	244
Total	866	686	3444
Pharmacy			
Number of Prescriptions filled	2777	2825	13606

5

1223714

MEDICAL DIVISION

MAY 1948

Patient Meals	April 1948	May 1948	Year to date
Regulars	3450	3174	18055
Lights	40	41	259
Softs	1878	1456	8749
Surgical Liquids	60	29	423
Tonsils & Adenoids	65	100	426
Specials	833	661	3039
Liquids	340	276	2336
Total	6666	5737	33287

Cafeteria Meals			
Noon	2394	2459	12317
Night	311	350	1537
Total	2705	2809	13854

Nursing Personnel		
First Aid Nurses	48	49
Clinic Nurses	16	19
Public Health Nurses	15	15
Hospital General Nurses	87	84
Aids & Orderlies	55	53
Total	221	220

General

Clinic visits increased by about 8% over April. There has been a steady increase in clinic visits since the first of the year. May was a month of general decreases in the hospital. April having had 531 admissions and 473 discharges. The average daily census dropped from 95 to 77.6 and total patient days decreased in about the same proportion.
Two clinical doctors were added to the staff.

1223115

MEDICAL DIVISION

MAY 1948

PUBLIC HEALTH SECTION

Administration	April 1948	May 1948	Year to date
Newspaper articles	15	19	81
Committee meetings	4	2	13
Attendance	20	20	81
Staff Meetings	2	2	11
Lectures & talks	7	4	31
Attendance	650	201	2126
Conferences	15	9	61
Attendance	35	30	158
Radio Broadcasting	3	0	3
Immunizations			
Diptheria	63	1134	1404
Influenza	0	0	29
Rocky Mt. Spotted Fever	5	6	16
Schick Test	1	0	1
Small Pox	34	401	530
Tetanus	3	2	22
Typhoid/	2	13	21
Whooping Cough	34	3	124
Total	142	1609	2147

Social Service

Forty-two cases were admitted during May. This figure added to the 94 cases carried over from April made a total of 136 cases. Twenty-two cases were closed, leaving the case load at 114 as of May 31st.

Sources of referral included: Other social agencies, 12; Public Health, 9; Doctors, 6; Interested persons, 4; Supervisors, 1; Juvenile Court, 2; Personal application, 2; G. E. Industrial Relations, 1; Schools, 2; Crime Prevention 3.

7

1223716

MEDICAL DIVISION

MAY 1948

Sanitation Inspections	April 1948	May 1948	Year to date
Bacteriological Laboratory			
Treated Water Samples	225	266	942
Milk Samples (Inc. milk, cream, ice cream)	130	119	770
Other Bacteriological Tests	365	350	1714
Total	720	735	3426
Communicable Diseases			
Chicken Pox	7	6	72
German Measles	11	6	54
Gonorrhea	20	19	74
Impetigo	0	1	7
Influenza	3	4	65
Measles	286	182	552
Meningococcic Meningitis	0	1	1
Mumps	234	89	907
Pediculosis	0	1	2
Pinkeye	3	2	8
Ringworm	1	0	1
Scabies	4	0	31
Scarlet Fever	1	7	12
Syphilis	20	28	103
Tuberculosis	0	2	3
Vincent's Infection	1	0	1
Whooping Cough	6	12	43
Total	597	360	1941
Total Number Nursing Field Visits	2188	1602	7970

General

Public health offices were moved from Dormitory W-21 to a building across the street from Hadlec Hospital. Space was also made available for public health at North Richland Medical Center.

The trend of morbidity showed a decrease in communicable diseases with a slight rise in morbidity other than communicable diseases.

Immunization clinics were held in the schools at which time small pox vaccine and diptheria toxoid were offered.

8

211

1223717

ACCOUNTING DIVISIONS

MAY 1948

GENERAL

Our internal controls made it possible to eliminate the following effective in May:

(a) Time Books previously maintained by Supervision for weekly paid employees (6 594 weekly paid employees as of May 31, 1948).

(b) Travel Orders

(c) Employment Interview Travel Orders

Instructions were also issued covering:

(a) Discontinuance of daily time cards in 700 and 1100 Areas. Weekly paid employees in these areas will now use weekly time cards. This change will eliminate, on a yearly basis, approximately one-half million cards.

(b) Revised procedure in obtaining approvals to overtime and reporting overtime work to Payroll Divisions, which eliminates considerable paper work and eliminates requirement for approval of superintendents (or of employees in comparable or higher positions) on time cards for overtime worked.

Considerable time was spent on improving Financial Statements and Operating Expense Reports, and to revise reports and procedures to reflect changes in organization resulting from establishment of the Nucleonics Department.

Government reimbursements are current and following is comparison of unreimbursed charges as of May 31, 1948 with April 30, 1948:

	May 31, 1948	April 30, 1948
Billed on Public Vouchers	$ 8 020 563	$ 7 414 396
Submitted on Pre-Billing Audit Vouchers	2 036 746	4 528 760
Unbilled	8 528 475	7 505 574
Total	$18 565 784	$19 448 730

Unbilled charges include accrued liabilities and after deduction of these accruals, the unbilled charges represent approximately two week's expenditures.

1223718

Accounting Divisions

STATISTICS

General	May	Total to Date
HW Instruction Letters issued	6	89
Office Letters issued	4	37
Organization Announcements issued	8	124
Supplements and Revisions issued	1	22

Employees and Payrolls	Total	Monthly Payroll	Weekly Payroll
Employees on payroll at beginning of month	8 094	1 631	6 463
Additions and Transfers in	316	52	264
Removals and transfers out	(136)	(19)	(117)
Transfers from Monthly to Weekly Payroll	---	(10)	10
Transfers from Weekly to Monthly Payroll	---	26	(26)
Employees on payroll at month end	8 274	1 680	6 594
Gross amount of payroll	$2 604 789	$777 696	$1 827 093
Average salary rate per hour	1.861	2.554	1.666
Average salary rate previous month	1.862	2.512	1.656

Overtime payments	April	May
Weekly Payroll		
Number	4 995	6 294
Amount	$88 996	$111 975
Monthly Payroll	$29 395	$ 45 232
Number of changes in Salary Rates and Job Classifications and transfers between divisions	1 775	1 022

Employee Plans

Pension Plan	April	May
Number participating at beginning of month	4 381	4 510
New participants and transfers in	149	131
Removals and transfers out	(20)	(26)
Number participating at month end	4 510	4 615
% of eligible employees participating	97.8%	97.6%

Employees Retired	May	Total to Date
Number	1	22
Aggregate Annual Pensions including Supplemental Payments	$31	$ 3 217
Amount contributed by employees retired	$76	$ 870

Group Life Insurance	April	May
Number participating at beginning of month	5 350	5 403
New participants and transfers in	152	230
Cancellations	(29)	(19)
Removals and transfers out	(70)	(74)
Number participating at month end	5 403	5 540
% of eligible employees participating	75.1%	75.1%

1223719

Employee Plans (continued)

Insurance Claims	May	Total to Date
Number of deaths	1	13
Amount of Insurance	$6 375	$73 023
Amount contributed by employees	$ 50	$ 603

Group Disability Insurance - Personal	April	May
Number participating at beginning of month	6 435	6 511
New participants and transfers in	172	251
Cancellations	(13)	(8)
Removals and transfers out	(83)	(70)
Number participating at month end	6 511	6 684
% of eligible employees participating	90.6%	91.4%

Group Disability Insurance - Dependent		
Number participating at beginning of month	3 993	4 021
Additions and transfers in	76	110
Cancellations	(14)	(15)
Removals and transfers out	(34)	(37)
Number participating at month end	4 021	4 079

Group Disability Insurance - Claims		
Number of claims paid by insurance company:		
Employee Benefits		
Weekly Sickness and Accident	93	78
Daily Hospital Expense Benefits	95	76
Special Hospital Services	82	72
Surgical Operations Benefits	56	51
Dependent Benefits Paid		
Daily Hospital Expense Benefits	112	93
Special Hospital Services	107	91
Amount of claims paid by insurance company:		
Employee Benefits	$8 408	$8 29[illegible]
Dependent Benefits	3 970	3 496
Total	$12 378	$11 787

Group Disability Insurance - Premiums		
Personal - Employee Portion	$11 088	$11 310
- Company Portion	6 723	6 848
- Total	$17 811	$18 158
Dependent - Employee Portion	3 628	3 671
- Company Portion	395	405
- Total	$ 4 023	$ 4 076
Grand Total	$21 834	$22 234

Annuity Certificates (For du Pont Service)	May	Total to Date
Number issued	1	47

1223720

Employee Plans (continued)

U. S. Savings Bonds

	April	May
Number participating at beginning of month	2 625	2 622
New authorizations	80	864
Voluntary cancellations	(68)	(25)
Removals and transfers out	(15)	(11)
Number participating at month end	2 622	3 450
% participating	32.4%	41.7%
Bonds issued - maturity value	$149 225	$153 600
- number	3 824	3 911
Refunds issued	52	24
Revisions in authorization	38	502

Suggestion Awards	May	Total to Date
Number of Awards	18	137
Total amount of awards	$195	$1 390

Security Slogan Awards		
Number of Awards	0	7
Total amount of awards	0	$175

Employee Sales Plan	May		
	Total	Major Appliances	Traffic Appliances
Certificates issued	332	59	273
Certificates voided	5	3	2

Salary Checks Deposited	April	May
Weekly	1 002	1 023
Monthly	780	827
Total	1 782	1 850

Special Absence Allowance Requests		
Number Submitted to Pension Board	7	4

Absenteeism (Weekly Paid Employees)	1947	1948
January 1 to May 31	1.97%	2.42%

Accounting Divisions

Subcontractors' Payrolls Number of Subcontractors' Employees on Payroll At End of Month	April	May
Cost-Plus-A-Fixed-Fee Subcontractors		
Guy F. Atkinson Company and J. A. Jones Construction Company	9 151	9 643
Sub-subcontractors		
Newbery-Neon Company	620	709
Urban, Smyth, Warren Company	1 036	1 106
*Newport, Kern & Kibbe	19	12
*Mehring & Hansen	85	83
*Saxon Painting Co.	14	-0-
*Peninsula House Movers	25	-0-
*V. S. Jenkins Company	48	26
*King Electric Co.	2	-0-
*Graysport Construction Company	135	123
*Joe Wilson Flooring Co.	3	-0-
*E. L. Knight Electric Company	16	28
*Bailey Plumbing & Heating	7	-0-
The Kellex Corporation	421	465
Giffels & Vallet, Inc.	178	160
National Carbon Company	233	232
C. C. Moore & Company, Engineers	40	1
J. A. Terteling & Sons, Inc.	420	585
Sub-subcontractors		
*Graysport Construction Co.	-0-	44
*Ested Electrical Co.	10	16
*Head Plumbing Co.	6	15
Morrison-Knudsen Co., (Tank Farm)	864	707
Sub-subcontractors		
Trowbridge & Flynn Electric Company	18	16
Morrison-Knudsen Co., (Track Maintenance)	104	147
McNeil Construction Company	-0-	395
Lump Sum Subcontractors		
C. C. Moore & Company, Engineers	2	3
John L. Hudson	142	59
Sub-subcontractors		
Payne Plumbing Company	15	5
E. L. Knight Company	9	1
Edmondson's Blind & Shade Company	1	-0-
Permawall Construction Company	134	17
B. K. V. Heating Company	16	1
J. P. Head	-0-	6
L. D. Reeder	37	5
H. D. Hacker	4	-0-
J. Gordon Turnbull, Inc.	45	45
Curtis Gravel Company	8	1
Dewitt C. Griffin & Associates	17	3

1223722

Subcontractors' Payrolls (continued)	April	May
Nettleton, Baldwin, Sound Construction Co.	221	345
Sub-subcontractors		
Paul Thorgaard Plumbing Co.	4	52
Curtis Gravel Co.	10	33
Holert Electrical Co.	-0-	8
Chris Berg	-0-	8
Chicago Bridge Co.	-0-	-0-
Sub-subcontractor		
E. F. Sherrill	2	-0-
X-Ray Products Co.	29	38
Kelly Wells Co., Inc.	-0-	5
Strasser Drilling Co.	-0-	4
Raymond Pile Co.	-0-	15
Total	14 151	15 167

*Lump Sum Sub-subcontractor operating under a Cost-Plus-A-Fixed-Fee Subcontractor.

SUMMARY OF PAYROLL REIMBURSEMENTS TO SUBCONTRACTORS

Subcontractor	Payrolls		Taxes & Welfare Plans (Employer's Portion)	
	This Month	Total To Date	This Month	Total To Date
Atkinson-Jones	$3 417 795.65	$19 046 262.90	$ --	$474 120.87
Newbery-Neon	261 379.89	1 260 825.38	--	27 066.74
Urban, Smyth and Warren	548 378.00	2 278 605.25	38 791.92	48 390.15
Morrison-Knudsen	391 488.13	1 239 874.87	19 355.58	19 355.58
Trowbridge & Flynn	7 598.03	37 394.20	818.30	818.30
J. A. Terteling	126 013.81	227 704.86	--	1 452.00
C. C. Moore	18 693.40	50 993.40	--	--
Mc Neil	43 837.60	43 837.60	--	--
Kellex	121 480.88	451 226.20	11 640.19	42 753.12
National Carbon	737.00	6 408.00	29.48	117.92
Giffels & Vallet	84 826.88	227 000.39	9 504.85	9 504.85
TOTALS	$5 022 229.27	$24 870 133.05	$80 140.32	$623 579.53

Accounting Divisions

Subcontractor's Payrolls (continued)

Subcontractor	SUBCONTRACTOR'S PAYROLLS AUDITED Period Covered This Month	Period Covered Total to Date	Gross Amount This Month	Gross Amount Total to Date
Atkinson-Jones	4/11/48 to 5/1/48	7/25/47 to 5/1/48	$2 301 231.39	$16 928 768.20
Newbery-Neon	4/11/48 to 5/1/48	10/7/47 to 5/1/48	180 841.14	1 090 605.03
Urban, Smyth and Warren	4/11/48 to 5/1/48	10/8/47 to 5/1/48	296 889.04	1 891 110.78
Morrison-Knudsen	4/25/48 to 5/22/48	12/4/47 to 5/22/48	390 144.19	1 247 076.43
Trowbridge & Flynn	4/25/48 to 5/15/48	1/14/48 to 5/15/48	7 451.99	39 892.83
T. A. Terteling	4/19/48 to 5/16/48	3/1/48 to 5/16/48	139 998.10	250 313.77
C. C. Moore	4/15/48 to 5/19/48	12/17/47 to 5/19/48	16 375.75	57 363.34
Mc Neil	4/23/48 to 5/23/48	4/23/48 to 5/23/48	44 342.07	44 342.07
Kellex (1)	4/1/48 to 4/30/48	9/15/47 to 4/30/48	121 480.88	451 226.20
National Carbon (1)	4/1/48 to 4/30/48	8/1/47 to 4/30/48	737.00	6 408.00
Giffels & Vallet (1)	3/28/48 to 5/8/48	10/2/47 to 5/8/48	88 765.89	232 773.58
TOTAL			$3 588 897.44	$22 239 880.29

(1) Audited by Atomic Energy Commission

7.

Accounting Divisions

General Accounting

Payments Made to Subcontractors thru May 31, 1948

		Contract No.	Commitment To Date	Amount Paid To Date	Amount Withheld 5-31-48
Morrison-Knudsen Co. Inc.	CPFF	PHX-13693	$1 196 290.00		
Costs (Track Maintenance)				$1 161 640.00	
Fixed Fee				31 185.00	$ 3 465.00
Morrison-Knudsen Co., Inc.		G-110	1 807 394.25	1 807 394.25	Retainer Pd.
X-Ray Products Corp.		G-115	59 238.40	59 238.40	Retainer Pd.
Atkinson-Jones	CPFF	G-133	52 298 608.38		
Payrolls				23 135 271.29	452 995.88
Other (1)				19 264 064.65	-0-
Lone Pine Roofing Co.		G-134	52 875.13	52 875.13	Retainer Pd.
National Carbon Co.,Inc	CPFF	G-135	1 475 000.00		
Payrolls				6 525.92	-0-
Other (2)				1 783 169.30	-0-
Graybar Electric Co.		G-136	422 981.00	70 228.40	-0-
G. A. Pehrson and Associates		G-137	18 700.00	15 895.00	-0-
John S. Villesvik		G-138	3 013.50	768.75	-0-
H. Brandt Gessel and Associates		G-139	11 719.50	2 787.50	-0-
DeWitt C. Griffin and Associates		G-141	205 524.00	172 023.59	19 113.73
John L. Hudson and Associates		G-142	4 849 441.51	4 751 092.71	-0-
Catlow Transport Co.		G-143	310 840.92	295 298.87	15 542.05
Northwest Hauling Co.		G-144	155 403.07	155 403.07	Retainer Pd.
Sperry Products Co.		G-147	1 875.00	1 875.00	-0-
The Kellex Corp	CPFF	G-148	882 446.21		
Payrolls				493 979.32	-0-
Other (3)				457 769.59	-0-
Catlow Transport Co.		G-149	25 426.00	25 426.00	Retainer Pd.
Giffels and Vallet, Inc.	CPFF		353 653.89		
Payrolls				236 505.24	5 773.19
Other (4)				77 240.80	-0-
D. A. Whitley Co.		G-152	27 046.76	27 046.76	-0-
Roy L. Bair Co.		G-153	34 447.00	34 447.00	-0-
Strum Elevator Co.		G 155	4 145.00	4 145.00	-0-
C. C. Moore and Co. Engineers		G-157	57 422.35		
Payrolls	CPFF			50 993.40	6 369.94
Lump Sum			304 287.00	92 523.87	10 280.43
Strum Elevator Co.		G-158	2 218.00	2 218.00	-0-

Accounting Divisions

General Accounting

Payments Made to Subcontractors thru May 31, 1948 (continued)

		Contract No.	Commitment To Date	Amount Paid To Date	Amount Withheld 5-31-48
Nettleton-Baldwin-Anderson Inc.					
Sound Construction & Engineering		G-172	$9 731 210.00	$ 145 062.90	$ 16 118.00
J. A. Terteling & Sons, Inc.	CPFF	G-173	443 054.37		
Payrolls				229 156.86	22 608.91
Others				40 177.40	-0-
X-Ray Products Corp.		G-175	107 550.00	44 372.75	4 930.31
McNeil Construction Co.	CPFF	G-190	221 142.74		
Payrolls				44 342.07	504.47
Others				-0-	-0-
J. Gordon Turnbull	(5)	G-150	500 000.00	-0-	-0-
			$78 972 913.93	$57 182 344.88	$578 548.64

(1) Amount Paid includes Provisional Reimbursement in the amount of $16 969 400.05 of which $15 745 242.38 was liquidated by audited Atkinson-Jones billings.

(2) Amount Paid includes $1 000 000 in advances.

(3) Amount Paid includes $350 000 in advances.

(4) Amount Paid includes $50 000 in advances.

(5) Amount of Commitment Estimated

Construction Commitments and Expenditures	Commitments	Expenditures
July 1, 1947 to April 30, 1948	$93 171 284	$57 670 416
July 1, 1947 to May 31, 1948	103 545 107	68 225 011

Number of Accounts Payable Vouchers Entered	April	May
General Electric	5 729	5 650
du Pont	12	5
Total	5 741	5 655

Amount of Accounts Payable Vouchers Entered		
General Electric	$14 523 410.01	$11 756 397.71
du Pont	3 093.68	258.65
Total	$14 526 503.69	$11 756 656.36

Amount of Checks Issued		
General Electric	$14 573 768.08	$11 692 156.70
du Pont	46 035.30	1 778.34
Total	$14 619 803.38	$11 693 935.04

Number of Checks Issued		
General Electric	3 964	3 853
du Pont	7	4
Total	3 971	3 857

1223726

250

Accounting Divisions

General Accounting

	April	May
Public Vouchers (1034) Submitted to AEC		
Vouchers not reimbursed at beginning of month	$ 5 758 885.46	$ 7 414 396.25
Vouchers submitted for reimbursement during month	15 741 794.82	15 485 187.39
	21 500 680.28	22 899 583.64
Vouchers reimbursed during month	14 086 284.03	14 879 020.52
Vouchers not reimbrused at end of month	$ 7 414 396.25	$ 8 020 563.12
Public Vouchers (1034) Submitted to AEC		
Number of vouchers not reimbursed at beginning of month	123	161
Number submitted during month	391	434
	514	595
Number reimbursed during month	353	413
Number of vouchers not reimbursed at end of month	161	182
Public Vouchers not Submitted to AEC		
Pre-Audit Vouchers (1035) Issued	$ 4 528 759.58	$ 2 036 745.83
Pre-Audit Vouchers (1035) not Issued	7 505 574.12	8 508 474.67
Total Unbilled Items	12 034 333.70	10 545 220.50
Number of Pre-Audit Vouchers Issued Awaiting AEC Approval	142	124
Items Over 60 Days Old Not Billed to AEC on Public Voucher (1034)		
Accounts Payable	$ 482 816.32	$ 814 222.33
Accounts Receivable	473.45 Cr	278.05 Cr
Freight	8 758.05	25 617.84
Payrolls - G.E.	241 966.67	-0-
Payroll Deductions - F.O.A.B. Taxes	490.02	5 077.71
Subcontractor's Payrolls	223 987.52	210 842.99
Subcontractor's Retainers - Accrued	34 501.75	55 011.76
Continuity of Service - Accrued	25 951.38	195 103.85
Total	$ 1 017 998.26	$ 1 305 298.43
Cash Receipts - General Electric		
Accounts Receivable		
U. S. Government	$14 086 284.03	$14 879 020.52
Rents	83 760.41	82 045.85
Hospital	54 998.29	55 017.52
Telephone	5 530.57	4 736.71
Miscellaneous	2 089.49	2 120.10
Employee Sales	2 181.98	1 685.94
Bus Fares	8 466.20	7 481.15
Educational Program	637.90	461.35
Sale of Furniture	181 700.57	57 352.83
All Other	11 079.14	11 899.66
Total	$14 436 728.58	$15 101 821.63

1223727

Accounting Divisions

General Accounting

		April		May
Cash Receipts - du Pont				
U. S. Government	$	3 826.11	$	681.47
Hospital		47.50		47.50
Vendor's Refunds		448.15		682.29
Total	$	4 321.76	$	1 411.26
Cash Advances and Expense Accounts				
Cash Advance Balance at end of Month	$	48 652.09	$	45 320.90
Cash Advance Balances Outstanding over one month		6 331.92		3 895.90
Travel Orders Received		200.00		-0-
Traveling and Living Expenses				
Paid Employees		45 049.96		54 537.15
Billed to Government		45 948.29		55 712.76
Balance in Variation Account at end of month		13 588.75 Cr		14 764.36 Cr.
Hospital Accounting				
Accounts Receivable Balance at Beginning of Month	$	47 135.66	$	52 008.74
Total Invoices During Month		78 845.32		76 200.11
Total	$	125 980.98	$	128 208.85
Less Cash Received and Payroll Deductions		73 972.24		80 311.28
Accounts Receivable Balance at end of month	$	52 008.74	$	47 897.57
Property				
Number of Transfer Notices Received		851		469
Number of Items Affected		7 180		1 978
Number of Receiving Reports Classified		11 152		11 745
Number of Receiving Reports Vouchered		2 123		1 740
Number of Items Tagged at Beginning of Month		202 338		208 296
Number of Items Tagged this Month				
Decal Tags		3 676		-0-
Metal Tags		2 282		2 972
Number of Tagged Items Dropped from record		-0-		(21 427)
Total Tagged Items Recorded		208 296		189 841
Number of Items Recorded in quantity only				
At Beginning of month		157 683		160 276
Items added to Record during month		2 593		1 595
Quantity Items Dropped from Record during month		-0-		(57 867)
Total Items Recorded in Quantity		160 276		104 004
Total Items on Record		368 572		293 845

1223728

Accounting Divisions

PERSONNEL AND ORGANIZATION	April	May
Number of employees		
On Payroll at beginning of month	611	259
Removals and transfers out	(373)	(10)
Additions and transfers in	21	16
Number at end of month	259	265
Net increase (or decrease) during month	(352)	6
% of termination and transfers out	61.5%	3.8%
% of absenteeism	3.2%	2.4%

Reasons for increase of 6 in number of Accounting Division employees during May are as follows:

General

One employee terminated and one employee transferred from Schenectady.

General Accounting: No change in total number.
Two new employees were assigned to General Accounts, and three to Accounts Payable. One employee was transferred from the Stenographic Pool to the Cost Division, which was offset by one transfer in to the Stenographic Pool. One employee was removed from the payroll on illness leave. There were four terminations during May.

Weekly Payroll: Net increase of five employees.
Five new employees. One returned from leave of absence.
One termination.

Cost: Decrease of one employee.
One new employee. Two terminations.

Cost Analysis: Increase of two new employees.

Injuries

	April	May
Major	0	0
Sub-major	0	0
Minor	8	2

1223729

PERSONNEL AND ORGANIZATION (continued)

Number of Accounting Division employees and open employment requests as of June 1, 1948 were as follows:

	Number of Employees			Open Employment Requests			
				Replacements			
	Non-Exempt	Exempt	Total	For Employees Removed	For Employees Leaving	Additions	Total
General	3	4	7	0	0	0	0
General Accounting	122	12	134	0	6	0	6
Weekly Payroll	53	6	59	1	2	5	8
Monthly Payroll	10	2	12	0	0	0	0
Subcontractors Payrolls	15	1	16	0	0	4	4
Cost	27	3	30	0	0	1	1
Cost Analysis	3	2	5	0	0	0	0
Methods	0	2	2	0	0	0	0
Total	233	32	265	1	8	10	19

Open replacements may be summarized as follows:

Clerk	1
Junior Clerks	7
Office Machine Operators	6
Typist	1
Office Helpers	4
Total	19

R. W. Carriger, Assistant Works Accountant, resigned as of May 31, 1948.

J. P. Holmes was transferred from the General Office on April 26, 1948 as Assistant Works Accountant.

J. R. Woodhead was transferred from Weekly Payroll to Monthly Payroll as of June 1, 1948, with classification of Supervisor - Accounting, and assigned to Supervision of Accounting work at North Richland Hospital.

1223730

Accounting Divisions

SECTIONAL ACTIVITIES

Cost

Considerable time was spent with representatives of the auditing firm of Touche, Niven, Bailey and Smart. This firm has been retained to review accounting procedures and problems relating to the communities of Oak Ridge, Richland, and Los Alamos, with the aim of establishing similar accounting procedures and financial reports for each of these locations which will permit comparisons between locations and more accurate reporting of costs of municipal and realty operations. Several employees spent the major portion of their time from May 7 to 21 inclusive, explaining present procedures to their representatives and acquainting them with cost distribution problems peculiar to Kadlec Hospital and Community of Richland.

Revision to the monthly cost reports received favorable comments and constructive criticism during the month. Minor revisions to the April reports were made as a result of these comments.

Considerable work was done towards accumulating detailed information from the cost ledgers to work into sample report forms prepared by T. R. Evans, who has been assigned to Hanford for the purpose of installing a cost accounting and reporting procedure in line with normal General Electric practices.

General Accounting

Accounts Payable

The number of accounts payable vouchers entered in May was 5650 as compared with 5729 in April. The amount of May vouchers, however, dropped from $14 523 410 to $11 756 398. Accounts Payable cash disbursements amounted to $11 692 157.

Vouchers on hand which had not yet been processed to the point where billing to the government could be made numbered 1098 and amounted to $2 073 826. One-third of these vouchers representing two-thirds of the value were chargeable to construction costs.

As of May 31, the unbilled total to date was $5 626 808. Of this amount, $3 636 980 represented May vouchers and $1 175 606 represented April vouchers.

Provisional reimbursements during the month to Atkinson-Jones amounted to $1 955 402. The difference between provisional reimbursements made to date and vouchers submitted by Atkinson-Jones which have been approved is $1 224 158.

The freight section paid 1434 freight bills totaling $223 735. All payments have been distributed to cost with the exception of $5 297 which is the general ledger balance of the suspense account freight.

1223731

Accounting Divisions

General Accounting

Accounts Receivable

Telephone

Due to the continuing large number of employees moving into new houses, volume of work resulting from the handling of telephone work orders has continued heavy. Since no new lines are available to these moving into new houses, it was necessary to issue approximately 200 refunds for unexpired rentals. This section prepared 2402 telephone statements which included approximately 16 000 toll tickets for non-official telephones. Total telephone revenue was $14 918.

Rent

A steadily increasing number of living facilities were assigned in May which proportionately increased volume and responsibilities in this Section. The number of each type of unit rented increased from the previous month; houses, from 4240 to 4298; apartments, from 41 to 72; dormitory rooms, from 1026 to 1067; barracks rooms, from 6660 to 7763; North Richland houses, from 79 to 138; and trailer spaces, from 1075 to 1274.

In addition to normal work incidental to the above, accounting records were maintained for 418 new house leases, 167 lease cancellations, and 702 lease modifications. Dormitory room turnover was heavy with 186 moving in and 166 moving out of rooms.

Revenue for the month, including that from facilities, amounted to $302 844.

U. S. Government

Government reimbursement of vouchers submitted has continued on a current basis. The receivable balance of $8 020 563 represents 182 Public Vouchers (Form 1034), the oldest of which was submitted for reimbursement on May 25, 1948.

Billings to Government

At the beginning of the month, unbilled items amounted to $12 034 334. During the month reimbursable charges booked amounted to $13 996 073 and billings to the government amounted to $15 485 187. The unbilled balance at the end of May was $10 545 220, of which $2 036 746 is in the Government Audit Branch for approval, i.e., has been submitted on Form 1035.

Accounts payable billings are current, as the unbilled amount of $5 626 808 represents approximately one-half month's charges.

6-21-48 AW-0166
e.8

Accounting Divisions

General Accounting

Billings to Government (continued)

Unbilled G. E. payrolls total $1 795 863 and include the monthly payroll for May and three weekly payrolls.

Subcontractors' payrolls in the amount of $2 089 561, payroll deductions not disbursed in the amount of $541 346, and accrual for continuity of service expenses in the amount of $538 943, represents the remaining larger unbilled items.

Cash Advances and Cash Change Funds

Cash advanced for traveling and living expenses totaled $46 574 in May. Employees accounted for $49 905 during the month through the submission of approved expense accounts or by refunding unused cash advanced. The balance in the Cash Advances account of $45 321 represents current advances. Government reimbursements for expense accounts billed are being made promptly; however, no billings to the government have been made for expenses incurred by employees transferred from du Pont.

With the establishment of two additional Cash Change Funds, the total active funds was increased to 37 and totaled $4285.

Hospital Accounting

Revenue from hospital services rendered as well as the number of invoices issued decreased slightly, from the month of April. In May, 12 001 invoices were issued totaling $76 200 (including North Richland). This slight recession was taken advantage of as greater efforts were given to the reduction of the receivable balance which was reduced from $52 009 to $47 898.

The oldest accounts were closely followed and 10 which were considered uncollectible were assigned to the government.

At the North Richland Hospital, the general medical, public health, and first-aid sections began rendering service on May 17. Invoices issued in May numbered 558 and totaled $1125. Three employees handling accounting work are assigned to the North Richland Hospital.

Property

With the redefinition of Class B Property which excluded items valued at less than $50.00, both field and office personnel have experienced a lesser volume of work. Property transfer vouchers have been sharply reduced and field crews have had less items to record due to this change.

All available personnel were engaged during the month in relieving property records of items to be dropped. During the month, 79 294 items were written off, leaving approximately 171 580 yet to be written off.

Drafts were written, but not completed, covering procedures for the handling of Class B property at Morganton, N.C. and for the handling of Class B property at other off-project locations.

1223733

Accounting Divisions

General Accounting

John L. Hudson & Associates

Payments to John L. Hudson & Associates under Subcontract G-142 through May 31, 1948 may be summarized as follows:

Total progress payments made to John L. Hudson under the original contract amount to	$ 3 288 810.48
Additional payments were made through March 31, 1948 under the Supplemental Agreement to Subcontract G-142 dated March 6, 1948 in the amount of	379 645.20
Payments made under this Supplemental Agreement in April amounted to	725 710.81
Payments made under Supplemental Agreement in May amounted to	356 926.22
Total payments made to John L. Hudson through May 31, 1948	$ 4 751 092.71

May payments to Hudson consisted of reimbursement for:

Payment in May by John L. Hudson to Subcontractors	$ 140 824.69
John L. Hudson's payroll and other May expenses	93 260.61
Reimbursements based on costs certified to by Peat, Marwick, Mitchell & Company	122 840.92
Total payments to Hudson during May, 1948	$ 356 926.22

Accounting Divisions

Payrolls

The following "Request for Reimbursement Orders" have not yet been approved by the Atomic Energy Commission:

Date of Request	Date Transmitted to Commission	Items Covered by Request
8/26/47	8/27/47	Seven exempt job classifications for Design and Construction
8/26/47	8/28/47	Five exempt job classifications for Construction Purchasing
8/26/47	8/28/47	Exempt job classifications for Expediting Supervisor and Expeditor
9/10/47	9/10/47	Exempt job classifications for Construction Purchasing
5/13/48	5/14/48	Retroactive payment for absences after restoration of continuity of service.

There were no errors reported by the Government Audit Section in connection with the audit of the Monthly Payroll for April. Complete audit by the Government Audit Section of Weekly Payrolls for April revealed the following errors:

1. Explanations of adjustments were not shown on the Payroll in two instances.
2. Five postings were illegible on the Government copy of the payroll.
3. There were two cases of deductions posted incorrectly, but payments were correct.
4. Hours were posted incorrectly in three instances, but payments were correct.
5. There was one rate shown incorrectly on the payroll although, no error in payment occurred.
6. There was one error in calculation of the gross payment on the Morrison-Knudsen Payroll resulting in an overpayment to the employee amounting to $1.30.

Weekly and Monthly payrolls have been reimbursed by the government through the month of April.

In connection with reporting of earnings for Social Security purposes, Form SS 1-B for the second quarter 1948, will be posted by the use of the National Cash Register Payroll Machines. New forms have been designed which permit preparation of Form SS-1-B and posting of previous quarter balances including gross earning, pension deductions, and withholding, to the next quarter Earnings Record Cards, simultaneously.

In order to maintain work on a current basis for the month of May, it was necessary for the Weekly Payroll Division to work overtime on all four Saturdays of May and on Monday, May 31. Additional work resulting from the reorganization of Hanford Works, U. S. Savings Bond Campaign, the new weekly clock card procedure, and a short payroll week as a result of a holiday on May 31, made the overtime necessary.

The elimination of daily time cards for employees in the 700-1100 areas will result in a savings in Weekly Payroll Division of approximately 80 man hours per week as well as a savings of 1/2 million time cards per year.

1223735

Subcontractors' Payrolls

During May, Reimbursement Orders Nos. 15 to 20, approving the rates of pay for various manual classifications appearing on Atkinson-Jones payrolls, were received from the Atomic Energy Commission.

Reimbursement Orders, however, are still needed for the following in order to have complete approval for all rates paid by Atkinson-Jones to date:

> The policy to regard hours paid to non-manual employees for accrued leave as hours worked when computing overtime for hours worked in excess of forty (40) in any week.
>
> Rates for Painter Apprentices, Locomotive Brakemen, and Bricklayer Apprentices.
>
> Foreman differential for Sawfilers, Power Saw Operators, Millwrights, Piledrivermen, Shinglers, Sign Painters, Spray Painters, Shop Glazers and Steel and Plate Glazers.
>
> Premium payments to Carpenters for hazardous and onerous work and for hazardous work to Electricians and Painters.

Of the rates not yet approved by Reimbursement Orders, properly documented Requests have been received from Atkinson-Jones and approved by the Construction Division, covering the Accrued Leave payments, rates for Painter and Bricklayer Apprentices and the Atomic Energy Commission has been requested to extend their approval dated November 19, 1947, of $0.25 per hour differential for Brush Painter Foremen to cover the Foremen over other classifications of Painters.

No Request for Reimbursement Order has been received covering the classification Locomotive Brakeman. On May 10, 1948, Atkinson-Jones reclassified these employees to the classification "Switchman" for which the rate of pay is identical and approved. As Locomotive Brakeman appeared on the payrolls during the period December 5, 1947, to May 10, 1948, a Reimbursement Order is needed covering this period.

A Request for Reimbursement Order covering the Foreman Differential for Sawfilers, Power Saw Operators, Millwrights, Piledrivermen and Shinglers is being prepared by Atkinson-Jones. However, no agreement has been reached between the Construction Division and Atkinson-Jones.

Atkinson-Jones requested that Foremen be paid a differential of $0.25 per hour above the highest Journeyman under their supervision. The Construction Division contends that the Foreman should be paid a differential of $0.25 per hour above the rate paid to the majority of the Journeymen under his supervision.

1223736

Accounting Divisions

Subcontractors' Payrolls

Premium payments to Carpenters of $0.25 per hour for onerous work have been approved by the Construction Division, effective August 1, 1947. However, all premium payments to Carpenters for hazardous work prior to May 26, 1948, will not be recognized and payments subsequent to May 26, 1948, will be deemed reimbursable only if adequate scaffolding and proper safety measures are not maintained.

Premium payments to Electricians and Painters for hazardous work have ceased and Atkinson-Jones ic in the process of obtaining the required evidence that such payments are prevalent in this area.

All premium payments paid to Carpenters, Electricians and Painters for hazardous work are being tabulated and unless approved, are to be deleted from reimbursement.

Reimbursement Order No. 17, pertinent to Atkinson-Jones which approved payment of $2.99 per day of one hour straight time pay ($2.34) plus a round trip bus fare to Pasco (65 cents) to Plumbers and Steamfitters, was received this month. This payment approved for the period August 1, 1947 to May 31, 1948, totaled $116 445.45 and was disbursed by Atkinson-Jones on May 28, 1948.

During May, four (4) new Payroll Posting Machines were received from the Burrough's Adding Machine Company and have been turned over to Atkinson-Jones.

A considerable amount of time was spent during the month outlining for the representatives of the McNeil Construction Company the procedure to be followed in obtaining reimbursement for expenditures in connection with their cost-plus-a-fixed fee sub-contract.

A procedure in detail covering acceptable payroll practices was also prepared for their use. Approval was received from the Atomic Energy Commission and effective May 13, 1948, a policy to reimburse 100% of net payrolls weekly was initiated.

A Request for Reimbursement Order, covering all revisions in salary and wage schedules and employment policies not heretofore covered by Morrison-Knudsen Sub-contract G-1012 (Railroad Maintenance) or subsequent Reimbursement Orders, was submitted to the Atomic Energy Commission during May.

Reimbursement Orders, covering various classifications previously approved for Atkinson-Jones, were received for Morrison-Knudsen, C. C. Moore, and J. A. Terteling, however, this practice is to be discontinued as it is planned by the Atomic Energy Commission to issue Reimbursement Orders to General Electric and permit General Electric to extend their coverage to any Subcontractor as the need arises.

Morrison-Knudsen payrolls No. 1 to 22 inclusive, covering the period December 4, 1947, to May 1, 1948, and C. C. Moore payrolls Nos. 1 to 23 inclusive, covering the period December 17, 1947, to May 19, 1948, were transmitted to the Atomic Energy Commission Audit Unit.

1223737

PAGE #2

	4/30/48		5/28/48	
X-Ray Products	29		41	
Nettleton - Sound	225		347	
Thorgaard Plumbing	4		56	
Chris - Berg Co.	--		10	
Holert Elect. Co.	--		8	
Strasser Drilling Co.	--		4	
Kelly Wells Co.	--		5	
McNeill Const. Co.	--		410	
Raymond Pile Co.	--		19	
Total		14,245		15,421
GENERAL ELECTRIC PERSONNEL		8,089		8,259
GRAND TOTAL		24,033		25,861

261

1223738