IN-05050

Hw-7-4193

OP-59 REVISED

Hw-7-4193-Del

PROJECT 9536

727742

File

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Route List
1.
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5.

Date June 10, 1946

Subject Monthly Report - May 1946

REPOSITORY PNL

COLLECTION Atmospheric Releases

BOX No. N/A

FOLDER N/A

To R. M. Evans

From D. A. Miller

Copy No. 1 [redacted]

BEFORE READING THIS DOCUMENT, SIGN AND DATE BELOW:

5050

INV SEP 23 '83

CLASSIFICATION REVIEW FOR DECLASSIFICATION BUT LEFT UNCHANGED

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HW-7-4193-Del

June 10, 1946

This Document consists of
87 Pages No. 1 [redacted]

HANFORD ENGINEER WORKS

MONTHLY REPORT

MAY 1946

[redacted]

DECLASSIFIED
WITH DELETIONS

TABLE OF CONTENTS

GENERAL SUMMARY

The 100-D and 100-F Areas operated at power levels of 250 MW and 200 MW respectively. No unusual conditions were experienced. Scheduled outage for metal discharge was taken in each area. Over-all operating time efficiency for the month was 90.7%. Refrigeration units were put in service in 100-F Area on May 6 and in 100-D Area on May 7 and 23.

Separations plant operations were adjusted to metal discharge schedules in the 100 Areas. Sixty-four charges were started through the Canyon Buildings and the same number were delivered from the Isolation Building. Minor difficulties were encountered, with an abnormal precipitate resulting from the presence of phosphoric acid in the nitric acid supply. Piping changes have been made in the tank farms to preclude recurrence of this type contamination.

The plant force decreased by 13 from the monthly roll and 115 from the weekly roll to a total force at month-end of 4390.

Safety performance continued quite satisfactory throughout the month, with no time-losing injury experienced. As of May 25, 135 injury-free days had been accumulated.

STAFF

MANAGER	D. A. MILLER
ASSISTANT MANAGER	T. N. STAPLETON
PRODUCTION SUPERINTENDENT	M. H. SMITH
TECHNICAL SUPERINTENDENT	W. C. KAY
WORKS ENGINEER	ROSS HARR
P DEPARTMENT SUPERINTENDENT	C. N. GROSS
S DEPARTMENT SUPERINTENDENT	F. B. VAUGHAN
POWER SUPERINTENDENT	F. M. ACKER
MAINTENANCE SUPERINTENDENT	A. J. SCHWERTFEGER
ELECTRICAL SUPERINTENDENT	H. A. CARLBERG
INSTRUMENT SUPERINTENDENT	W. P. OVERBECK
SERVICE SUPERINTENDENT	W. T. CLOUD
TRANSPORTATION SUPERINTENDENT	R. T. COCKE
MEDICAL SUPERINTENDENT	W. D. NORWOOD
CHIEF ACCOUNTANT	S. D. EWING

5/25/46

[redacted]

FORCE REPORT

DEPARTMENT	NON-EXEMPT 4/25/46	NON-EXEMPT 5/25/46	EXEMPT 4/25/46	EXEMPT 5/25/46	TOTAL 4/25/46	TOTAL 5/25/46
Management	-	-	4	4	4	4
P	198	186	56	49	254	235
S	270	269	65	65	335	334
Technical	170	145	72	74	242	219
Power	388	380	89	90	477	470
Maintenance	438	421	88	87	526	508
Electrical	166	164	37	36	203	200
Instrument	112	111	29	28	141	139
Protection	377	372	72	69	449	441
Service	194	193	64	64	258	257
Transportation	542	514	62	61	604	575
Medical	265	266	103	101	368	367
Accounting	640	624	17	17	657	641
TOTAL	3760	3645	758	745	4518	4390

PERSONNEL DISTRIBUTION

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	700-1100 Area	TOTALS
P DEPARTMENT									
Supervisors	6	14	13	-	-	12	-	4	49
Operators	12	38	38	-	-	98	-	-	186
Total	18	52	51	-	-	110	-	4	235
S DEPARTMENT									
Supervisors	-	-	-	23	32	-	-	3	58
Operators	-	-	-	105	151	-	13	-	269
Others	-	-	-	-	3	-	3	1	7
Total	-	-	-	128	186	-	16	4	334
TECHNICAL DEPARTMENT									
Supervisors	-	5	3	4	10	7	-	4	33
Chemists, Engineers & Physicists	3	9	3	10	24	27	-	8	84
Analytical Personnel	3	15	7	21	29	15	-	-	90
Others	1	-	-	4	5	2	-	-	12
Total	7	29	13	39	68	51	-	12	219
POWER DEPARTMENT									
Supervisors	15	26	23	6	9	-	3	8	90
Operators	41	104	99	23	36	10	-	37	350
Others	4	6	6	1	6	3	-	4	30
Total	60	136	128	30	51	13	3	49	470
MAINTENANCE DEPARTMENT									
Supervisors	2	6	16	8	13	4	-	20	69
Engineers	1	-	-	-	4	-	-	13	18
Mechanics	11	24	64	39	66	26	-	144	374
Others	1	1	1	5	7	1	-	31	47
Total	15	31	81	52	90	31	-	208	508

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	700-1100 Area	TOTALS
ELECTRICAL DEPARTMENT									
Supervisors	1	3	2	3	4	1	12	6	32
Electricians	3	17	13	16	15	7	53	25	149
Others	1	3	1	1	3	-	9	1	19
Total	5	23	16	20	22	8	74	32	200
INSTRUMENT DEPARTMENT									
Supervisors	1	3	4	3	3	5	-	3	22
Engineers	-	-	1	-	-	-	-	5	6
Mechanics	6	16	17	16	17	18	-	6	96
Others	-	1	1	-	-	6	-	7	15
Total	7	20	23	19	20	29	-	21	139
PROTECTION DEPARTMENT									
Supervisors	5	6	6	9	7	5	1	30	69
Patrolmen	22	49	50	83	71	24	8	57	364
Others	-	-	-	-	-	-	-	8	8
Total	27	55	56	92	78	29	9	95	441
SERVICE DEPARTMENT									
Supervisors	4	-	-	-	1	4	7	42	58
Firemen	14	-	-	-	-	10	-	48	72
Laundry Operators	-	-	-	-	1	-	-	1	2
Inspectors	5	4	4	4	4	-	2	1	24
Janitors	2	5	5	6	8	6	1	36	69
Others	-	-	-	-	10	1	5	16	32
Total	25	9	9	10	24	21	15	144	257
TRANSPORTATION DEPARTMENT									
Supervisors	2	2	2	1	2	1	8	43	61
Drivers (Based on Areas Served)	22	26	25	30	38	21	31	35	228
Mechanics	1	1	1	1	2	-	8	49	63
Trainmen	-	4	4	3	4	-	2	2	19
Laborers	3	4	4	2	2	-	-	31	46
Others	9	10	10	5	11	4	12	97	158
Total	37	47	46	42	59	26	61	257	575

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	700-1100 Area	TOTALS
MEDICAL DEPARTMENT									
Physicians	-	-	-	-	-	-	7	11	18
Dentists	-	-	-	-	-	-	-	8	8
Nurses	←	5	→	3	3	1	7	76	95
H.I. Specialists	1	8	9	28	38	28	24	7	143
Technicians	1	1	1	1	1	1	-	20	26
Others	-	-	-	-	-	-	-	77	77
Total	2	14	10	32	42	30	38	199	367
ACCOUNTING DEPARTMENT									
Supervisors	-	-	-	-	-	-	-	17	17
Clerks	2	9	11	7	17	11	-	266	323
Telephone & Teletype Operators	-	-	-	4	4	-	-	32	40
Others	1	1	-	4	4	9	-	242	261
Total	3	10	11	15	25	20	-	557	641
MANAGEMENT	-	-	-	-	-	-	-	4	4
GRAND TOTALS	206	426	444	479	665	368	216	1586	4390

5/25/46

[redacted]

7-4193 [redacted]

EXEMPT PERSONNEL ARRIVALS AND DEPARTURES - MAY 1946

ARRIVALS

Name	Department	Physical Arrival	Origin
D. W. Haught	Technical	May 17	Trans.-Grasselli, Wilmington
E. E. Gillum	Transportation	" 1	Re-instate - Military Service

DEPARTURES

Name	Department	Physical Departure	Reason
L. A. Bides	P	May 2	Trans.-Grasselli, Philadelphia,P
W. S. Church	"	" 7	Trans.-Elchem., Niagara Falls, N
J. P. Conlon	"	" 8	Trans.-Grasselli, Sales, Wilmingto
R. R. Lunt	"	" 10	Trans.-Plastics, Arlington, N.J.
A. H. Mellott	"	" 10	Trans.-Explosives, Du Pont, Wash.
C. G. Lewis	"	" 20	Trans.-F. & F., Parlin, N.J.
J. Rumsey	S	" 6	Trans.-Rayon, Wilmington
J. T. Lassiter	"	" 7	Trans.-Ammonia, Wilmington
M. K. Harmon	Technical	Apr. 26	Trans.-Ammonia, Wilmington
J. T. Kirchmer	"	May 3	Trans.-Ammonia, Wilmington
P. E. Vandervoort	"	" 3	Trans.-Ammonia, Wilmington
P. D. Jost	"	" 6	Completion of Assignment
J. J. O'Connor	"	" 13	Trans.-Remington, Technical, Bridgeport, Conn.
W. R. Kanne	"	" 22	Completion of Assignment
H. L. Fisher	Maintenance	" 8	Resignation
M. M. Wainscott	"	" 13	Trans.-Ammonia, Wilmington
R. E. Leith	Electrical	" 24	Completion of Assignment
S. C. Lloyd, Jr.	Instrument	Apr. 26	Trans.-Elchem., Niagara Falls, N.Y
W. S. Spicer	Protection	May 3	Resignation
A. E. Carey	"	" 20	Completion of Assignment
H. E. Cannoles	Service	Apr. 26	Completion of Assignment
J. A. Ricker	"	May 3	Completion of Assignment
H. A. Hansen	"	" 22	Trans.-Grasselli, East Chicago, In
R. W. Cushing	Transportation	" 2	Resignation
M. Gavin, R.N.	Medical	" 10	Resignation
M. O. Lee, R.N.	"	" 24	Resignation

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HIJ

	HI	HJ	HK	HL
JC	1,708	117	30,471	2,102
JD	-	-	77,857	1,485
JE	1,708	117	108,328	3,587
JF	2,253	144	28,868	1,826
JG	17,121	67	556,759	2,195
JH	3,767	15	233,633	910
JI	-	-	16,514	66
JJ	17,468	68	765,895	3,006
JK	19,719	77	535,141	2,100
JL	-	17	-	561
JM	-	11	-	507
JN	-	2	-	58
JO	-	4	-	51
JP	-	16	-	555
JQ	-	26	-	489
JR	-	1	-	55
JS	-	-	-	41
JT	-	6	-	-
JU	-	17	-	-
JV	-	4	-	-
JW	-	9	-	-
JX	-	-	153,468	601.7
JY	8,256	32.4	178,530	700.7
JZ	6,592	25.9	150,925	591.7
KA	14,848	58.3	482,923	1,894.1
KB	35	.1	97,435	382.5
KC	8,434	33.1	114,138	448.8
KD	6,700	26.3	86,207	338.0
KE	15,169	59.5	297,780	1,169.3
KF	15,120	59.3	135,079	530.2
KG	9,240	36.3	128,500	504.4
KH	-	-	-	-
KI	24,360	95.6	263,579	1,034.6
KJ	15,286	60.0	132,524(a)	520.2(b)
KK	-	-	95,816	376.1
KL	8,679	34.1	29,568	116.0
KM	23,965	94.1	257,908	1,012.3

	HM	HN	HO	HP
KN	1,883	129	1,336	91
KO	352	21	1,102	70
KP	21,634	85	28,923	103
KQ	13,813	54	7,388	29
KR	29,044	114	32,664	128
KS	19,993	79	19,993	79
KT	-	1	-	2
KU	-	27	-	27
KV	56,068	220	56,033	220
KW	64,570	253	64,392	253
KX	64,826	254	64,718	254
KY	185,464	727	185,143	727
KZ	45,263	177.7	36,072	141.6
LA	-	20.7	-	22.3
LB	-	918.2	-	1,012.3

	HQ	HR
LC	0	98,107
LD	6,755	121,418
LE	5,421	98,675
LF	12,176	318,200
LG	20	78,004
LH	6,920	94,071
LI	5,493	72,734
LJ	12,433	244,809

	HS	HT	HU	HV	HW
LK	12,135,000	7,327,000	-	19,462,000	213,357,000
LL	11,631,000	6,877,000	-	18,508,000	197,942,000
LM	714,000	411,000	-	1,125,000	12,868,000
LN	9,613,000	7,715,000	-	17,328,000	187,737,000
LO	-	775,000	-	775,000	7,491,000
LP	9,613,000	6,940,000	-	16,553,000	180,246,000
LQ	4,055,000	4,113,000	-	8,168,000	-
LR	-	-	-	2,811,000	-
LS	-	-	-	16,812,000	179,801,160

(a) Includes 34,022 units at C
(b) Includes 133.5 units at C

P DEPARTMENT

MAY 1946

PILE SUMMARY

	Pile B**	Pile D	Pile F
Time Operated (%)	0	90.3	90.6
*Power Level (MW)	0	250	200
*Inlet Water Temperature (°C)	~~11.1~~ 14.5	11.1	11.1
*Outlet Water Temperature (°C) (Maximum °C, 10 tubes, 0.240 zone)	~~11.1~~ 14.5	47.2	39.6
Number of Scrams	0	1	2
Number of Purges	0	1	1
Helium Consumption (cubic feet)	38,816	31,757	39,695
Metal Discharged (tons)	0.127	33	26.4
Inhours Gained (this month)	—	-1	7
*Inhours Poisoned	—	325	347
*Inhours in Rods	—	39	49

* Month-end figures
** Pile B in standby condition all month

PILE BUILDINGS

General

During the month of May 4 units of refrigeration were started up at D pile and 4 units at F pile.

Date of Outage	Outage Caused — Scheduled: Metal Discharge	Outage Caused — Scheduled: Other Causes	Unscheduled	Length of Outage (Hours)
4-30-46	D			15.6
5-2-46	F			12.3
5-7-46	D			17.2
5-9-46	F			16.7
5-14-46	D			14.6
5-15-46	F			15.3
5-17-46			F	.6
5-21-46	D			17.5
5-21-46	F			19.2
5-22-46		F		1.5
5-22-46			D	2.1
5-22-46			F	.6

Operating Experience

During the D pile shutdown of April 30 special requests Nos. 13 and 9-1 were loaded into tube No. 3574. On May 2 requests Nos. 7, 9-3, 10-A, and 16-1 were loaded into tube No. 1565 of F pile. On May 14 tube No. 0174 at D pile was loaded with lead dummies in order to make it available for continued study of graphite expansion. On May 21 tubes Nos. 0980 and 3880 were discharged and recharged with

bismuth; also, pressure drop tubes Nos. 2473, 2475, 2375, and 2575 were discharged and recharged with regular Metal. Since Nos. 2375 and 2575 were also corrosion tubes, this meant that they were abandoned for corrosion measuring purposes.

During the month of May Pile D and Pile F were completely purged, and all high tanks of Piles B, D, and F were functionally tested.

The unscheduled outage at F pile on May 17 occurred subsequent to routine testing of the vertical rods. When the rods were lowered under power for the test, No. 21 and No. 27 remained in the up position. On returning the other rods to their up position, enough slack had developed in the cables on No. 21 and No. 27 rods to permit them to drop after the system had been returned to normal, thus shutting down the unit. The unscheduled outage at D Pile on May 22 was occasioned by slippage of the clutch on No. 34 vertical rod, which caused the limit switch contact to be broken. After restarting, the unit was again shut down due to a failure in the B. P. A. power system, which caused an unscheduled shutdown at F pile at the same time.

The scheduled shutdown at F pile on May 22 was caused by a non-standard loading of tube No. 4674. During the metal discharge of May 21, this tube was scheduled to be changed from an air-filled to a water-cooled, dummy-loaded tube. In the time available it was impossible to make the necessary changes, and it was re-capped and operation begun again. It was later determined that the grooved steel pieces had been removed and not replaced. This made the May 22 shutdown necessary to correct the sub-standard condition.

Mechanical Performance

During May, Nos. 3 and 6 fan motors at D pile were dismantled for preventive maintenance, and the winch motor on vertical rod No. 14 was replaced for the same reason. No. 3 fan motor bearings were replaced, and Nos. 3 and 6 fan motors were interchanged to equalize clearances between the rotor and stator of each motor. At B pile the oil in the hydraulic system was changed when it was found that the pH was changing.

Testing of vertical rod thimbles at B, D and F piles was completed during the month and all thimbles are now apparently in good mechanical condition.

During the month the new periscope, originally fabricated for use at B pile, was installed in the cab at D pile.

Fourteen orifices of 0.100 inch diameter were installed in the poison and bismuth loaded tubes at D to conserve water. At B pile new air-actuated 3rd safety device valves were installed and placed under test.

On May 7 at D pile tube No. 2692 was found to be very difficult to discharge. For this reason the pieces were isolated and it was found that one piece was badly blistered and bowed. Plans have been made to discharge this tube and borescope it for mechanical damage.

Installation of plumb-bobs has been completed at F pile. Base measurements of pile movements as indicated by the plumb-bobs will be established for all piles during the first week of June. At B pile permanent bench marks for transit survey have been established and base readings taken on the front, rear, and far side. Similar bench marks for the front and rear of the D and F piles have also been established.

At B pile, No. 27 thimble was removed to permit borescope examination of the graphite in the thimble well. The graphite was found to be in good condition.

Horizontal rod thimbles Nos. 2 and 9 at B pile, and No. 2 at F pile were borescoped. At B pile no abnormalities were found. No. 2 at F pile showed evidence of slight abrasion of rod and thimble near the front end, but was in satisfactory operating condition.

During the month extensive tests were made on tube and gun-barrel movement at B pile. New equipment for measuring movement of tube and gun-barrel separately were placed in service and a new gauge and tube jack were made up.

Retention Basin

Work to eliminate the leakage of water from the basin directly to the flume at B pile is still in progress.

Special Hazards

During the month of May it was determined that the wooden containers used for bismuth shipments were being returned from the customer seriously contaminated by an α emitting material. This resulted in the necessity for burial of the contaminated boxes and re-fabrication of new boxes, sealed with two coats of paint to reduce moisture penetration. A request is being made through appropriate channels that the customer endeavor to reduce as much as possible the occurence of this contamination.

A new method of separating the papooses from the Metal section, consisting of a pneumatic abrasive wheel operating under water, was used at B pile to separate the four papoose pieces it had been found impossible to break by conventional means. The wheel operated satisfactorily, but in cutting one piece the wheel penetrated into the Metal, causing a serious contamination of the storage basin. This made it necessary to declare the basin a yellow danger zone, until means could be found to decontaminate the basin.

Fish Laboratory

The condition of the chinook salmon held in undiluted area effluent water and in dilutions up to one part effluent to ten parts river water continues to be very poor. Heavy mortalities and slow growth occur in these groups of fish. Although the fish in Troughs Nos. 7 and 8, one part effluent to ten parts river water, have survived from the original stock of eggs hatched in these troughs, the fish seem particularly susceptible to disease and there is a great variation in the size and condition of the fish in these lots. In other troughs, where the effluent water is diluted with fifty or more parts of river water, the mortality and growth of the fish is much the same as that of the control fish being held in straight river water. The following table summarizes the mortalities in the various troughs since the lots were reduced in number on February 27, and indicates the relative size of the fish at the present time.

[redacted]

P Department

Trough No.	Water Condition	% Mortality since Feb. 27, 1946	Avg. Weight in grams
1 & 2	Straight Effluent	92	1.0
3 & 4	Effluent Refrigerated	79	0.8
5 & 6	1 Eff. to 3 River	62	1.2
7 & 8	1 Eff. to 10 River	39	1.6
9 & 10	1 Eff. to 50 River	4	2.1
11 & 12	1 Eff. to 250 River	3	2.1
13 & 14	1 Eff. to 500 River	2	2.0
15 & 16	1 Eff. to 1000 River	3	2.2
17,18, 19 & 20	Straight River Water	3	2.1

Another series of fish was exposed to the undiluted area effluent water of trough No. 1 for periods ranging from one to fourteen days. These fish were then monitored by the H. I. Department for activity.

Collection of fish in the Columbia River by gill net has been started and specimens captured have been turned over to the H. I. Section for activity studies. Thus far fish have been caught above the 100-B Area, near the 100-F Area and at Hanford.

300 AREA — METAL FABRICATION

Extrusion, Outgassing, Machining, and Chip Recovery.

Extrusion, Machining, and Combined Yield were as follows:

	% Yield (Regular)		
	April	May	To Date 1946
Extrusion	92.8	92.7	92.2
Machining	80.3	80.5	78.5
Combined	74.5	74.6	72.4

Extrusion ran six shifts during the month.

To date a total of 375 rods with a nominal diameter of 1.200" have been extruded for Special Request No. 24. These rods are being machined into slugs in accordance with this Special Request. The yield of finished slugs from billets was approximately 12% lower than the yield obtained in fabricating regular slugs.

At the present time four lathes are set up for turning the SX slugs to diameter and two other lathes are equipped to face the ends and turn the radius on one end of the slugs.

P Department

The Chip Recovery Yield was as follows:

% Yield		
April	May	To Date 1946
92.1	90.1	*92.5

*During this period enough chips to make 2087.2 lbs. of briquettes were recovered from the Chip Recovery Equipment. These chips had accumulated over the entire period of operation. The amount was added to the yield "To Date, 1946", but was not counted in the figure for May, 1946.

The Chip Recovery process went on a one-shift basis April 29, 1946, and on May 20, 1946, was further reduced to take care of current production.

Briquetting of chips which were shipped to H. E. W. from another site was stopped due to an excessive number of fires encountered in processing. Decision was reached to burn these chips to oxide.

Canning Operation

Metal Slug — Type canned and yields obtained were as follows:

	% Canned		% Yield	
	May	To Date 1946	May	To Date 1946
New Machined — A's	0	12.7	0	78.7
New Machined — A's (Cast)	0	1.0	0	78.8
New Machined — MZ's	81.2	67.1	85.1	83.3
Recovered — Z's	10.7	11.5	94.3	85.5
Recovered — X's	8.1	7.7	93.2	89.3
Total:	100.0	100.0	86.8	83.4

Thirty slugs of Request No. 24 were canned this period. After final testing they appeared to be satisfactory. Twenty-two of these slugs were prepared for shipment off the Project for evaluation.

Seven pieces of Request No. 9-2 were canned this period.

Canning Rejects, by cause, were:

	% of Total Canned		
	April	May	To Date 1946
Non-seating	1.1	1.7	2.5
Wrinkled Cans	1.3	1.4	2.1
Marred Surface	3.5	2.0	4.1
Al Si on Outside of Can	.5	.3	.3
Air Pockets	.1	.1	.1
Frost Test Rejects	1.1	1.4	1.3
Bad Welds	.4	.2	.5
Warp	.4	.2	.2
Miscellaneous Causes	.9	*5.9	5.5
[redacted]	9.3	13.2	16.6

5 [redacted]

* A total of 882 slugs which were rejected for high tin content of the Canning Bath on May 16, and May 17, 1946, accounted for 5.2% of this item. Analysis of the Canning baths showed that the tin content was beyond maximum limits for one Canning line on both the days mentioned above. The slugs canned on this line during these two days were rejected and sent to Recovery. The cause of the excessive tin carry-over to the Canning bath was attributed to low copper content of the Bronze bath.

Recovery Operation

	% Recovered		Average Weight — Lb.	
	May	To Date 1946	May	To Date 1946
Z Slugs	32.1	54.7	7.791	7.807
X Slugs	61.1	40.1	7.721	7.725
Rejects	6.8	5.2	—	—
Total	100.0	100.0		

Inspection and Testing

Autoclave rejects were as follows:

	April	May	To Date 1946
New Machined — A's	0.00/M	0.00/M	0.00/M
New Machined — A's (Cast)	0.00	0.00	0.00
New Machined — MZ's	0.11	0.15	0.07
Recovered — Z's	0.00	0.00	0.00
Recovered — X's	0.00	0.00	0.00
	0.08/M	0.12/M	0.04/M

The "As Received" quality of cans, caps and sleeves were as follows:

	% Useable		
	April	May	To Date 1946
Aluminum Cans	33.7	33.7	79.1
Aluminum Caps	97.0	86.7	95.6
Steel Sleeves	32.1	79.3	74.6

Two shipments of Boss type caps had approximately 14% rejection due to surface defects. Random samples were inspected from later shipments with total rejects running 2% or less.

300 Area — Test Pile

This unit operated 6 eight-hour days, making 85 routine tests on uranium slugs.

PRODUCTION SUMMARY

Sixty-four batches were started in the Canyon Buildings during the month and sixty-four were processed through the Concentration Buildings. Sixty-four batches were delivered by the Isolation Building. The average purity was 98.6%.

Sufficient processed metal with 60 day cooling period was scheduled to the B Plant so that age of metal would not limit the rate of operation. The average time cycle for the month was 17.5 hours. T Plant processed the available metal which remained. Excess recycle which could not be added to scheduled T Plant batches because of batch size limitations resulted from this unbalance between areas and was reworked in three special recycle batches in the T Concentration Building.

The storage basin at 212N was emptied during the month and the building placed in stand-by condition.

Production Performance Data (4/26/46 – 5/25/46, Inclusive)

	B Plant	T Plant	Combined
Number of charges started	41	23	64
Number of charges completed	37	27	64
For completed charges:			
Percentage of starting product in waste:			
This month	6.8	5.4 (a)	6.3
Last month	6.4	5.6 (b)	6.1
Cumulative to date	6.7	6.9 (c)	6.8
Percentage of starting product recovered:			
This month	92.1	92.3	92.2
Last month	94.0	94.3	94.1
Cumulative to date	94.9	95.2	95.1
Percentage of starting product accounted for:			
This month	98.9	97.8	98.4
Last month	100.4	99.9	100.2
Cumulative to date	101.6	102.1	101.9
G Decontamination Factor (Log)			
This month	7.48	7.45	7.47
Last month	7.64	7.51	7.58
Cumulative to date	7.31	7.24	7.28

(a), (b), (c): Includes waste from processing recycle. The recycle wastes are estimated as: (a) 0.23%, (b) 0.14%, and (c) 0.22%.

Isolation Building Performance Data (4/26/46 – 5/25/46, Inclusive)

	% of Incoming Product			
	Prepared for Shipment	Recycle	Losses	Material Balance
Average for this month	97.0	4.2	0.11	101.3
Average for last month	96.3	4.0	0.06	100.4
Average to date	97.1	4.0	0.15	101.3

PRODUCTION PERFORMANCE

T and B Plants

Both the B and T Concentration Buildings experienced process difficulties because of a foreign precipitate in the product solution for delivery to the Isolation Building. The precipitate was identified as a phosphate due to the presence of phosphoric acid in the nitric acid used to dissolve the final lanthanum hydroxide precipitate. The phosphoric acid is believed to have been introduced at the time phosphoric acid tank cars were unloaded and the acid tank farm headers were temporarily cross-connected to add a small quantity of nitric acid (as a corrosion inhibitor) to the phosphoric acid. In both cases the quantity of phosphoric acid entering the nitric acid header was very small. Batches T-6-05-D 2, 3 and 4 have been successfully reprocessed in the Concentration Building and Batch 6-05-F 30 will be reprocessed in the same manner. Both plants have installed separate piping for the addition of nitric acid to the phosphoric acid storage tanks to prevent recurrence of such incidents.

The large difference (1.4%) in the percent of product going to waste this month in the T and B Plants is the cumulative effect of three conditions.

1. T Plant has skimmed the Section 13 by-product centrifuge cake to a 10 gallon instead of a 30 gallon residual volume, with an approximate 0.6% yield saving.

2. The production test to evaluate the reduction in potassium hydroxide quantity in Cell F was partially in force in T Plant. Yield saving on this test was 0.2 – 0.25%.

3. The long standing difference (0.5%) in performance of the Cell B product separations, which has received much comment in these and Technical reports, remains unsolved.

While the 10 gallon skimming in Section 13 has lowered the T Canyon decontamination factors (log) below 5.0, the radiation levels in the cells are no higher than those experienced when 35 day metal cooling was in force and decontamination factors through the Concentration Building remain high at 7.43. The centrifuge in Section 13 of B Plant has permanent skimmer stops which prevent skimming to 10 gallons. A centrifuge which has been modified and tuned-up in anticipation of skimmer failure has been scheduled for installation early in June so that B Plant may realize the product saving.

The production test in T Plant for reduction in KOH usage and yield improvement was temporarily discontinued while investigating the final Concentration Building solution troubles previously described. At that time, metathesis waste losses on 16 batches containing 70% of the standard potassium hydroxide concentration had averaged 0.41% whereas the average for standard concentration had been 0.65%. The test has been resumed and having confirmed the above data, the revision will be put in force in B Plant.

The many efforts during the past year to discover process reasons for a 0.5% difference in the waste losses from the fluoride product precipitation in Cell E of the Concentration Buildings have led to the belief that an obscure mechanical defect in the B Plant centrifuge is responsible for the higher losses. While that machine appears to be giving excellent mechanical performance, tests and replacements of a number of parts are being made and a spare centrifuge is being carefully assembled as a replacement should these measures fail.

Isolation Building

Operations in the Isolation Building were generally satisfactory during the month.

Batch T-6-05-D 2 left a large quantity of phosphate precipitate on the first filter (N-1) in Cell 2. This precipitate, which carried half of the product in the batch, was successfully slurried off for rework in the Concentration Building as noted earlier in this report.

Mechanical Performance

The delivery line from the centrifuge to the catch tank and the catch tank vent line in Cell E of the T Concentration Building were replaced because of leaks which had developed in the vicinity of welds.

A check made in the T Plant indicated that there are leaks to the cell sewer system from the heating and cooling jackets of 11 vessels. These leaks, ranging from 150 to 1750 pounds of water per hour, are believed to develop in stainless steel welds from the vibration of steam hammer while heating. Eight of the vessels are in locations where radiation levels prohibit repair, and replacement of the vessel would be necessary should the water leakage become unreasonably large.

The still column and condenser in Cell 4 of the Isolation Building were replaced because of leaks that developed in the vicinity of stainless steel welds.

Waste Disposal

An experimental installation of an ionization chamber adjacent to the first cycle waste line in the C Waste Area has been successfully used to measure the time required for this line to drain following the jetting of waste from the B Canyon. Drainage times are consistent and the record for each batch is being followed closely so that prompt corrective action can be taken in the event that a restriction of flow is indicated. A thermocouple attached to this line at the same point has permitted temperature measurements. Designs have been completed on the basis of these results for the installation of ionization chambers and indicating thermometers on the remaining tie lines between the B and C and the T and U Waste Areas.

The status of the Waste Storage Areas is shown in the following table:

Bldg. 241 Tanks	Type Waste	% Full B	% Full T	% Full C	% Full U	Reserve Capacity in Batches to Process B	Reserve Capacity in Batches to Process T	Reserve Capacity in Batches to Process C	Reserve Capacity in Batches to Process U	Total
x-101,2,3	Metal	100	100	34.0	29.1	0	0	177	191)	
x-104,5,6	Metal	—	—	0	0	—	—	269	269)	1054
x-201,2,3,4	Metal	0	0	0	0	37	37	37	37)	
x-107,8,9	1st Cycle	100	100	0	0	0	0	338	338)	
x-110,1,2	1st Cycle	—	—	12.1	—	—	—	297	—)	1244
x-104,5,6	1st Cycle	—	19.7	—	—	—	271	—	—)	
x-104,5,6	2nd Cycle	0	—	—	—	454	—	—	—)	1035
x-110,1,2	2nd Cycle	30.5	91.3	—	0	88	39	—	454)	

Special Hazards

Recent experience with contaminated air in the Canyons when cell covers were removed for inspection or repairs in the cell has led to the installation of filters on the air inlets to the crane cabs in the T and B Canyons. These filters are of the same type as those used on the exhaust air from the Isolation Building hoods. While access to the Canyon deck can be prohibited at such times, it is necessary to perform these operations from the crane cab. Preliminary tests indicate that the filters are effective in removing contamination. Restrictive measures are none-the-less in force until permanent air monitoring instruments can be installed in the crane cab to confirm these results, and provide a continuous record.

Meteorological Section

Eighty-five pre-dissolving forecasts were furnished to the T and B Plants, and fourteen high wind and thunderstorm warnings were issued to the Electrical Department.

General weather conditions for the month are shown in the following table:

Maximum average hourly wind velocity at 200'	35 mph
Minimum average hourly wind velocity at 200'	1 mph
Maximum average hourly wind velocity at 50'	26 mph
Minimum average hourly wind velocity at 50'	0 mph
Prevailing wind direction	WNW
Prevailing wind quadrant	W
Maximum soil temperature	128
Minimum soil temperature	39
Maximum air temperature (4 feet)	88
Minimum air temperature (4 feet)	35
Number of days with precipitation and/or fog occurred	4
Number of days precipitation occurred	4
Number of days fog occurred	0
Greatest duration of precipitation	8.7 hours

[redacted]

TECHNICAL DEPARTMENT

MAY 1946

100 AREAS

Physics

The xenon transients which were followed at 150 MW and at 0.5 MW prior to the shutdown of the B Pile have been subjected to further analysis. It has been found that the entire transient can be fitted by equations involving the accepted decay constants if corrections are applied (a) for the flattening effect of the xenon and (b) for the change in xenon effectiveness which is produced as the rods move in to compensate for the xenon decay; the latter correction is empirically derived from the same data. A third correction, for the shift of neutron flux attributable to the preferential burning out of the boron in the center of the pile, is believed to be comparatively small and has not been included in the present analysis. This analysis, which is still incomplete, indicates that the reactivity absorbed by xenon in equilibrium at 225 MW is about 505 inhours, in contrast to the value of 464 inhours given by the currently accepted xenon equations. The constants obtained as a result of the present analysis differ considerably from the earlier ones. Alternative attempts to explain the data on the basis of the assumption that the cross section of xenon varies with temperature have given less satisfactory results. The latter phase of the work was reported as an Interim Report on Production Test 105-54-P.

Indium foil irradiations in an empty tube of the shut-down B Pile have indicated that the neutron background of the pile consists of two components: (a) a component which is decaying with a half-life of 12.5 days, ascribed to the production of neutrons by the reaction of the 2.3 Mev gamma of lanthanum on the deuterium in the water; and (b) a constant component due to spontaneous fission which corresponds approximately to a flux density of 95 neutrons/cm^2 sec. or to a sub-critical condition of 1.6%k with all rods out.

Analysis of the reactivity gains attributable to the graphite of the D and F Piles indicates that to date the burning out of boron has contributed approximately 200 ih, which is somewhat smaller than the gain predicted on the basis of the reported boron content of the graphite. The smallness of these gains explains most of the discrepancy between the metal gains as computed (a) on the basis of data from the first 25,000 MWD of operation of the F Pile and (b) on the basis of data from metal discharges. The present data indicate a samarium fission yield of 0.64% in comparison to the value of 1.05% previously obtained. The data are insufficient to indicate whether the reduced gains should be attributed to incorrect analyses of the boron content or to the production of a poison by pile operation.

The apparent thermal conductivity of the graphite in the D Pile, as calculated from the temperatures recorded by six centrally located thermocouples, has dropped to 1/31 of its initial value after an exposure of 1040 MWD per central ton and is still decreasing at a rate of about four percent per month. These apparent conductivities are about 15% greater than the absolute conductivities measured on cooled test hole samples, and about 60% less than the absolute conductivities shown by test hole samples exposed at ambient pile temperatures.

Special Irradiations

Those parts of the Special Irradiations Program which were active during the month may be summarized as follows:

Requests No's. 8, 18, and the first installment of No. 15 were shipped on May 2.
Requests No's. 7, 9-3, 10-A, and 16-1 were loaded into the F Pile on May 2 for an exposure of four months.
Requests No's. 9-1 and 13 were loaded into the D Pile on April 30 for an exposure of one month.
Exposure of Requests No's. 3, 6, 12-B, and 16-2 is continuing.

Graphite Monitoring (Production Test 105-1-P)

Difficulties in breaking the capsule slugs removed from the B Pile necessitated the development of an underwater cutting wheel. The wheel operated satisfactorily and all capsules have been cut from their slugs. In cutting one undersized capsule, the wheel cut into heavy metal with a resulting increase in the contamination of the basin.

An improved lathe has been installed to machine irradiated capsules and casings.

Pneumatic Test of Vertical Thimbles (Production Test 105-51-P Supplement A)

In the study of thimble corrosion, all vertical thimbles at all areas have now been tested satisfactorily for leaks at 85-90 lbs./sq.in. air pressure. A special gasketed collar was developed to seal leaks between the rod guide and derby. A final report is in preparation.

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Corrosion

A borescope examination of Tube 3573 at D showed no serious corrosion effects. Shallow areas of localized etch were found on the downstream Van Stone flange. Minor pitting was noted in scratches in the cold upstream portion of the tube.

A stringer of aluminum dummies that was charged immediately after the B shutdown, to monitor corrosion and film formation, was examined after one-month's exposure. No pressure drop film or corrosion was noted.

Examination of No. 2 Horizontal Control Rod at F, which was difficult to move during a recent shutdown, indicated a foreign piece of steel in the rod gear rack had caused the binding. A borescope inspection of the thimble showed considerable abrasion on the top and one side for the first four feet and a fairly heavy white deposit about five to seven feet from the open end of the thimble. This latter condition is believed to be due to admission of air or moisture with the CO_2 on recent purges and as a result all CO_2 purging has been discontinued until adequate seals can be provided on the rods to prevent the admission of air into the thimbles.

In view of the scratches noted on No. 2 rod, all other horizontal rods at F were examined and found to be in good condition, although two pieces of foreign steel were found on the No. 5 rod gear rack and the pinion gear on No. 6 rod was found to have been cutting on the aluminum along the side of the rack.

Tube 1889 at F and Tube 2692 at D were difficult to discharge. One slug in the former tube was blistered and one slug in the latter case was both blistered and bowed. The tube ribs in both instances were damaged during the discharge. The above tubes had accumulated powers of 25.5 and 26.4 MWD, respectively.

Graphite Expansion

Traverses of horizontal rod thimbles No. 2 and 9 at B showed that the graphite tracks were quite smooth and free of discontinuities. Thimble 2 was bowed 0.6 inches more than thimble 9, in agreement with results obtained from traverses of process tubes. The absolute amount of bow was smaller than anticipated, indicating that the thimbles were not resting on the graphite at the side of the pile.

A second traverse of Tube 4674 at D on May 21, using the water-filled equipment, showed that the amount of bowing of this tube had increased 0.4 inches since February 26, 1946. The highest part of the tube is now slightly more than 2 inches above the lowest part. Tube 0174 at D was found to be very straight.

During the month important information regarding sidewise expansion of pile graphite was obtained. By means of a transit and a moving illuminated target, it was found that the total expansion from side to side of the B Pile at the 24 tube level was 2 inches. Tubes on the near side were bowed 2/3 inch toward the near side; central tubes were bowed 1/3 inch toward the far side; and tubes on the far side were bowed 4/3 inch toward the far side. In contrast with results obtained from vertical bowing traverses, it was found that the ends of the gun barrels had moved in the direction of the tube bowing, eliminating the region of sharpest curvature previously observed at the ends of the gun barrels in vertical traverses.

In consequence of the development of a method for measuring accurately the horizontal bowing of process tubes, less interest is now attached to the plumb bob traverse of vertical thimbles. The operation of the two-wire plumb bob is still rather unsatisfactory.

The 1500 lb. pneumatic jack and accessories have been improved and modified to permit the gunbarrels and aluminum tube to be jacked in and out independently. Preliminary tests on Tube 3691 at B indicate that the resistance of the gunbarrels may be a very appreciable part of the total resistance to tube movement.

200 AREAS

General

Material Balance

The overall 200 Area material balance for May was 99.7. Through 224 (Concentration) Building, the material balance was 98.4, and through 231 (Isolation) Building, it was 101.3.

Recovery of I^{131}

The quantity of 8 day I^{131} per metal dissolving (1 metric ton) was calculated to be 140 curies (approximately 1 mg.). A review of previous work indicated that only about 10% of the iodine remains in the metal solution with the remainder going out with the stack gases. On the basis of tests made at the Clinton Pilot Plant and on calculations based on meteorological data here, it appears that during the summer months, at least, very little of the iodine would appear in the stack condensate. Recent tests showed that 8 - 10 mc. per charge were recovered by means of the absorber in the Stack Monitoring Building (292). A change in the sampling port from the stack to the dissolver vent line prior to the point of dilution with ventilation air should increase the amount of iodine available at this point 300 fold or to about 3 curies per dissolving. It is estimated that about 110 curies per dissolving could be obtained by scrubbing all of the dissolver off gas prior to its dilution with air.

Canyon Building

Time Cycles (B)

At the present time, B Canyon is making "capacity runs" to determine the optimum cycle time which can be achieved. A detailed break-down of cycle time in each section is being made, but overall performance indicates that an average cycle time of 17 hours has been maintained during the past three weeks. Section 7 (metal extraction) appears to require the highest time cycle at present.

Basis Assay (B)

Tests involving dissolving acid showed that the precipitate remaining behind after removal of a charge from the precipitator of Cell 8 (T Plant) is dissolved by agitation alone, whereas about 1/3 of the precipitate in the

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precipitator in Cell 7 (B Plant) is not dissolved by simple agitation of the dissolving acid. It will be recalled that considerable work has been done on sampling 7-1 precipitator (B Plant) because of an imperfect material balance across Cell 7. Further work is contemplated to determine the most reliable basis for assaying product in this section.

Reduction in Phosphoric Acid (B and T)

The phosphoric acid concentration in the decontamination cycles in both B and T Areas has been stabilized at 0.4M. A review of the data showed that although the waste loss when using 0.3M as compared to 0.4M concentration was only slightly greater, there was a definite increase in loss. The 0.4M phosphoric was therefore adopted as optimum.

In the extraction step, T Canyon is operated with 0.3M phosphoric and B Canyon with 0.6M phosphoric; this operation will be continued until sufficient reliable data are available upon which to base a recommendation. A survey of the data available to date showed very little difference in waste losses while operating at either phosphoric concentration, the waste loss being about 0.80%. The effect of phosphoric acid concentration, so far as heat stability and volume of the metal waste are concerned, will be determined, and this will be a factor in establishing which concentration is preferable.

Neutralization of Decontamination Cycle Wastes (B and T)

It has been determined that the waste neutralizing tanks (15-8 and 15-9) will hold both halves of the neutralizing wastes without exceeding 90% of the tank capacity. Accordingly, in both B and T Canyons, both the first and second cycle wastes are now being neutralized in one instead of two portions as formerly. This procedure is simplified in shorter operations and permits more accurate neutralization than was previously possible because of unequal division of the charge into "halves".

Reduction in Skimming Heel (T)

Skimming to a 10-gallon heel in the 13-2 centrifuge (instead of the original 30-gallon heel) is continuing in T Canyon. The decrease in waste losses averages about 0.6%. There is a loss in the decontamination factor through the Canyon Building which however continues to be picked up satisfactorily through 224 Concentration Building with the result that the goal overall decontamination factor of 7 through the Concentration Building is still being attained. The Beckman readings on cans delivered to the Isolation Building continue to be satisfactory. The procedure of skimming to a 10-gallon heel is being continued.

Concentration Building

F-10 Solution Precipitates and Re-working (T)

Runs T-6-5-D-2, D-3, and D-4 contained heavy precipitates in the F-10 (Final Product) solutions. These precipitates were identified as $LaPO_4$ and $BiPO_4$ and were caused by the presence of a very small quantity of H_3PO_4 in the 60% HNO_3 used for dissolving the $La(OH)_3$ cakes out of Centrifuge F-2. Runs T-D-5-C-1, C-2 (chemical runs), MRC-1 (master recycle run), D-6 through D-10

and MRC-2 have all been processed successfully since by using C.P. 70% HNO_3 for cake solution, and the full process volume of KOH for metathesis. No material was recycled in any of these runs except D-10 and the two master recycle runs.

The F-10 slurries from Runs T-D-2, D-3 and D-4 were handled by jetting the contents from the PR (product recycle) transfer containers to the previously emptied E-4 storage tank. The containers were then thoroughly flushed with 60% HNO_3, routed by way of F-2 to F-10 to the container. Samples of the E-4 solution were tested in the laboratory in order to make certain that there was complete solution before jetting from E-4 to D-1 precipitater. In the case of Runs D-3 and D-4, the rework solution was diluted to the usual nitric concentration in (Cell D) D-1, and the normal $KMnO_4$ oxidation and recycled LaF_3 by-product precipitation carried out. However, since run D-2 contained a large amount of Hyflo-Super-Cel filter aid from the back-washing of the nutsche of the Isolation Building, the strong acid solution was centrifuged first in Cell D prior to dilution and oxidation, in order to remove the filter aid present.

Reduced KOH Metathesis Volume (T)

Prior to the appearance of heavy precipitates in the F-10 (Final Product) solutions as reported above, 14 runs had been made wherein a 30% reduction in the volume of KOH used for metathesis had been effected. These runs appeared satisfactory from the standpoint of complete metathesis and so far as complete removal of the cake from E-2 was concerned. Likewise, they showed a decrease in waste loss during centrifugation in F-2. However, pending the reworking of the charges containing precipitates, the full KOH volume was used for metathesis. A return to 30% reduction in KOH volume is contemplated in the immediate future.

Isolation Building

Product Recycled

The greater amount of product recycled from T Plant runs as compared to B Plant runs has continued and was true for 4 T Plant runs to which no recycled material was added. Also, although master recycle run T-MRC-1 showed an abnormally large "loss", run T-MRC-2 showed only an average amount of material for a T Plant run to be recycled. This would appear to disprove the belief that some component of recycle solutions causes an increase in the material recycled from the Isolation Building to the 224 Concentration Building. No other known process variable appears to be a factor for this discrepancy between B and T Plants. Additional information may become available when T-MRC-3 has been processed through the Isolation Building.

Oxalate Method of Handling Recycles

Consideration has been given to elimination of the addition of $KMnO_4$ to the $La_2(C_2O_4)_3$-HNO_3 solution at the Isolation Building because an excess of $KMnO_4$ was subsequently added in the 224 Concentration Building at the E-4 storage tank. Before the $KMnO_4$ addition can be eliminated at this point, however, it is necessary that it be possible to obtain a representative sample from the recycle material. The present standard weight of 60% HNO_3

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is insufficient to dissolve the $La_2(C_2O_4)_3$ precipitate completely in all cases. Further increase in the weight of HNO_3 in order to ascertain the amount required for complete dissolution in all cases is planned.

300 AREA

Extrusion

Billet groupings were prepared for the May billet shipment. Three billets were reported to have an unusually large silicon and hydrogen content, and a production test covering these billets has been prepared in order to isolate them in fabrication so that the effects of the impurities can be studied.

Extrusion and machining of slugs for Clinton has been continued during the month with satisfactory results.

A statistical comparison of billet densities and slug weights has been started to determine whether the trends and variations in the 305 test pile can be attributed to a density variation of the uranium metal from the various suppliers.

A group of 5 UM billets with a reported impurity of 50-100 ppm of mercury are being processed on a Production Test to determine the effects of this impurity.

Chip Recovery

With the advent of hot weather, drums full of Site Y uranium turnings stored outside in the open started to ignite and burn. Ignition of the chips presumably was caused by spontaneous combustion of residual non-soluble type oil remaining on the chips from previous machining operations. The danger of fires has been eliminated by filling the drums with water. In view of this hazard plus the fact that these chips contain a large amount of non-ferrous scrap, it is intended to roast the chips and return them to the Area Engineer for disposition for chemical recovery.

Data on all uranium chips processed to date indicated that the gross yield of briquetted turnings was 93%.

Canning

Tin Content of Canning Bath

Further tests have been conducted to determine a suitable control for tin in the canning bath. Present indications are that the rate of tin build-up in the canning bath is a function of the tin concentration of the bronze bath and that an adequate control of the latter will insure satisfactory control of the former. A program designed to eliminate further trouble from this source is in progress.

Special Requests

Experimental work on Request No. 24 (4 inch unbonded Clinton Slugs) indicates that the necessary equipment has been developed and the operating technique has been perfected to fabricate high quality slugs for this request.

Samples for Requests 9-1 and 9-3 have been canned and welded successfully.

Redesigned Welding Torch

An improved welding torch has been designed, fabricated, and used successfully on approximately 100 slugs. The new design permits the use of 90% of the electrode as compared to about 25% for the present torch. In addition, it embodies a ceramic insulator around the electrode shaft in place of a lamicoid insulator which chars and requires replacement every few days.

Argon for Welding

Welding tests and analyses of nine cylinders of argon from the Linde-Air Products Company were satisfactory so that this vendor may be established as an alternate source of welding argon.

Effect of Uranium on Critical Points of Al-Si

The selective removal of Si from an Al-Si bath by uranium addition was shown to be adequate to account for the normal Si loss with bath use. Addition of 5 g. of uranium to a 1000 g. Al-Si bath effectively removed 1.6 g. of Si as determined by thermal analyses. That an insoluble product formed was shown both by metallographic examination of casts from the resulting bath and by the fact that the solidus temperature was not altered.

Assuming an average compound layer about 0.001 inch thick, the entire Si loss, even when that loss be the maximum encountered, is in large part explained by the above. That the loss is less at times can only be due to the irregular presence of layers which block free access of Al-Si to the slug surface. Hence, it begins to appear that not only is Sn build-up in the canning pot a function of composition of prior baths, (previously shown) but Si loss is also such a function. Any attempts, therefore, to hold narrow Si limits cannot be entirely successful until adequate control of prior baths is effected.

Fate of Sn-Uranium Compounds in Al-Si

This study is obviously corollary to the above and is necessary in order to predict direction in the interrelation (if orderly) of bath compositions. The study of several compounds is contemplated in order to reveal the source of the occasionally troublesome uranium compound agglomerates in the canning bath. Construction of apparatus and preparation of specimens for the Sn-uranium compound study are nearly complete.

Solution Rate of Uranium in Bronze

Preparation of alloys, samples, and equipment for this study is nearly complete.

Uranium Orientation as a Factor in Slug Blistering

More rugged and accurate apparatus for reduction of samples was found to be necessary. A rolling mill with stellite-faced, driven rolls is being built. An additional requirement was an annealing furnace with truly inert atmosphere. Construction of an atmosphere purifier and of a suitable retort furnace is complete.

Solution Rate of Al in Al-Si vs Temperature and Si Composition

Experimental work is complete, and evaluation of data is well under way. Preparation of samples and alloys, for the next phase of this study - effect of tin in Al-Si on solution rate of Al has been started.

Technical Department [redacted]

LABORATORIES

The following tabulation indicates the source of 15,400 control samples (33,700 determinations) on which analyses were completed. A comparison is made with the previous month.

	April	May
Routine Control, 200 Area	1,830	2,500
Routine Control, 300 Area	500	370
Water Control, 100, 700 Areas	14,300	9,925
Process Reagents, 200 Area	875	1,130
Essential Materials	210	135
Special Samples	1,435	1,340
	19,450	15,400

Separations and Isolation Process Control

The geometry of the methane proportional alpha counting instruments (accepted value = 50.5%) in the Control Laboratories was routinely checked during the month and the following values indicated:

	April		May	
Laboratory	Geometry	No. of Tests	Geometry	No. of Tests
222-B	50.50	126	50.52	125
222-T	50.47	202	50.48	145
231	50.52	91	50.47	60

Further studies are being made in an attempt to improve the precision of the chemical titration method for determining plutonium in the final solution (solution AT) from the Isolation Process. While the current precision is satisfactory from a control standpoint, it is felt that the method is capable of greater precision. Toward this end a careful evaluation of analysts' techniques, the method and the apparatus is being made.

The routine use of a standard iron solution (see Document No. 3-3433, Laboratories Division Report for April, 1946) has proven helpful in showing up variance in the individual analysts' techniques. Out-of-standard results are followed up and critical points in the procedure pointed out. A general improvement has been noted in the precision of the analysts during the four week period the standard iron solution has been in use. In conjunction with this, duplicate determinations of each AT sample are being made by the analysts. In 65 such determinations made the average range of the values is 1.8%. Some of the values exceed this average and in these cases special effort is made to determine the cause and to point out the correction.

As previously planned, work is underway to alter the apparatus employed in the chemical titration procedure whereby it is felt some improvement in precision could be attained. The reaction vessel has been redesigned to permit adequate stirring of a 2 to 3 ml. volume. This is necessary if the sample size of AT solution is to be increased from 0.010 ml. to 0.035 - 0.050 ml. and if the concentration of the standard oxidant (ceric sulfate) is to be decreased from 0.2N to 0.02N. To accomplish this latter a specially designed micro burette capable of delivering a volume of 2 ml. has been made. At the present time, this program is getting underway and no results are available.

POWER DEPARTMENT

MAY 1946

GENERAL

The Power Department force was reduced approximately 1.5% due to transfers and terminations.

100 AREAS

Refrigeration units for chilling process water were started as follows: In D Area, two units were put into service May 6; two additional on May 21. In F, two units were put into service on May 7; two additional on May 23. The water temperature at the Pile Building before chilling was 10.9° C. at D, and 10.7° C. at F.

Concurrent with the high river level which developed about the middle of the month the iron residual in D and F Areas increased beyond usual values. Increased coagulant and silicate corrected the condition to normal at month's end.

On April 30 the R-K starting valve on the emergency turbo-generator was removed for repairs to the seat. A valve removed from the emergency turbo-generator, 200 Area, was installed. The repaired valve was subsequently installed on the 200-E equipment, where it replaced a temporary manually-operated globe valve.

The No. 12 process pump motor in B and the No. 2 process pump motor in F were returned to service with new primary windings. Failure of the motors was mentioned in the March report.

In the D Area a 1" pipe connection was installed between the process water system and the export line to the Pile Building. This will permit the building up of pressure in the export line after draining for repairs and is similar to the arrangement in the other areas.

Rubbing of a soot blower element caused the failure of a boiler tube in No. 1 boiler in B. The tube was removed and the openings blanked at the steam and mud drums.

The emergency turbo-generator in B has been placed on manual control in order to avoid sudden overloading of the one boiler in service, should an electrical power failure occur.

At 4:30 a.m., May 22 there was a power surge that tripped out some motors in the Filter Plants of D and F Areas, without affecting the more important process pump motors. The affected motors were immediately returned to service.

200 AREAS

The feed water deaerating heater, West Area Power House, was out of service between May 6 and May 10 for retubing of the vent condenser.

300 AREA

Operations were normal.

700-1100 AREAS

Approximately 150 feet of new 10" pipe was installed in the Sanitary water line along Stevens Drive near Lee Boulevard. This replaces light weight spiral welded pipe which failed in service.

The No. 4 Sanitary water well pump was completely overhauled.

The well field was flooded May 17 in order to replenish the diminishing underground supply.

The outside contractor removed 24,500 gallons of digested sludge from the Sewage Disposal Plant.

2

POWER DEPARTMENT STATISTICS

(April 26 through May 25, Inclusive)

	Unit		100 Areas	
			100-B	100-D	100-F
River Pump House (Building 121)					
River Stage	Ft. above sea level	(max.	404.8	393.6	380.5
		(min.	393.8	384.8	371.3
		(ave.	400.5	389.9	376.6
River Temperature	Ave. ° F		50.0	49.6	48.9
Water Pumped to Reservoir	gpm ave. rate		11785	41738	38570
Water Pumped to Refrigeration Plant (Condenser Water)	gpm ave. rate		—	4342	4771
Reservoir (Building 182)					
Water Pumped to Filter Plant	gpm ave. rate		8998	35435	34291
Water Pumped to Export System	gpm ave. rate		2122	2308	825
Water Pumped to Condenser System	gpm ave. rate		665	3995	3454
Chlorine Added at No. 1 Inlet	lb.		2000	560	—
Water Pumped to Export System	gpm normal flow		5255	5255	5255
Filter Plant (Building 183)					
Filtered Water to Power House	gpm ave. rate		66	283	279
Filtered Water to Process	gpm ave. rate		4280	30987	30650
Filtered Water to Fire & Sanitary	gpm ave. rate		73	197	182
Chlorine Used in Water Treatment	lb.		2385	11940	8290
	ppm ave.		.73	.93	.56
Lime Used in Water Treatment	lb.		37451	120000	100530
	ppm ave.		11.5	9.39	8.13
Ferrifloc Used in Water Treatment	lb.		91469	354000	326160
	ppm ave.		28.2	27.7	26.4
Carbon Used in Water Treatment	lb.		—	—	—
	ppm.		—	—	—
Raw Water Analysis	pH ave.		7.96	8.04	8.03
Finished Water Analysis	pH ave.		No Analysis	7.35	7.37
Alkalinity - M. O. Raw	ppm ave.		57	59	62
Alkalinity - M. O. Finished	ppm ave.		56	50	54
Residual Chlorine - Settled	ppm ave.		.57	.15	.49
Residual Chlorine - Finished	ppm ave.		.05	.08	.05
Iron - Raw	ppm ave.		.32	.37	.44
Iron - N. Clearwell	ppm ave.		No Analysis	.020	.017
Iron - S. Clearwell	ppm ave.		" "	.030	.021
Chlorides - Filtered Water	ppm ave.		1.6	1.3	1.1
Hardness - Finished Water	ppm ave.		74	72	78
Turbidity - Raw Water	ppm ave.		16	12	19
Turbidity - Filtered Water	ppm ave.		00.0	00.0	00.0
Refrigeration (Building 189)					
Refrigeration Produced	tons/day		—	2222	2396
Temperature Process Water In	ave.° F.		—	53.2	52.4
Temperature Process Water Out	ave.° F.		—	46.8	46.3

	Unit		100 Areas 100-B	100-D	100-F
Power House (Building 184)					
Steam Generated - Total	M lb.		20900	94526	89712
Steam Generated - Ave. Rate	lb./hr.		29028	131286	124600
225# Steam to Plant (est.)	M lb.		17765	80103	76145
15# Steam to Plant (est.)	M lb.		--	244	110
Coal Consumed	Tons		1685	8011	7477
Deaerator Plant (Building 185)					
Water Flow (ave.)	gpm		4130	30737	30400
Chemicals Consumed:					
Dichromate	lb.		3200	23700	23800
Sodium Silicate	lb.		38670	318260	298100
Chemical Analysis:					
pH	pH		7.66	7.65	7.65
Dichromate	ppm		No analysis	2.1	2.0
Silica	ppm		" "	7.5	8.7
Dissolved Iron	ppm		.021	.02	.02
Process Pump Room (Building 190)					
Total Water Pumped	gpm ave.		4055	30562	30253
Water Temperature	ave. ° F.		54.3	50.5	50.7
Total Water Pumped	gpm normal flow		4055	32134	31356
Valve Pit (Building 105)					
Chemicals Consumed:					
Lime	lb.		--	--	--
Hydrogen Peroxide	lb.		--	--	--
Oxalic Acid	lb.		--	--	--
Solids	lb.		--	2250	1800
Chemical Analysis:					
A, B, C & D Headers Standard Limits					
pH 7.5-7.8		(max.	7.74	7.70	7.70
		(min.	7.58	7.55	7.60
		(ave.	7.65	7.64	7.64
SiO_2	ppm	(max.	9.5	9.0	9.0
		(min.	5.0	7.0	5.0
		(ave.	6.8	7.3	6.6
$Na_2Cr_2O_7.2H_2O$ 1.8-2.2	ppm	(max.	2.1	2.1	2.2
		(min.	1.9	2.0	1.4
		(ave.	2.0	2.1	1.9
Iron	ppm	(max.	.04	.05	.04
		(min.	.02	.01	.01
		(ave.	.03	.02	.02
Free Chlorine as Cl_2	ppm ave.		.08	.07	.07

Power Department Statistics (Continued)

	Unit	200 Areas	
		200-E	200-W
Reservoir (Building 282)			
Raw Water Pumped	gpm ave. rate	2860	2394
Filter Plant (Building 283)			
Filtered Water Pumped	gpm ave. rate	409	420
Chlorine Consumed	lb.	331	245
Alum Consumed	lb.	4400	4200
Chlorine Residual-Sanitary Water	ppm	.46	.43
Power House (Building 284)			
Steam Generated - Total	M lb.	17861	20379
Steam Generated - Ave. Rate	lb./hr.	24807	28304
Coal Consumed (est.)	tons	1100	1472
Coal in Storage	tons	3859	3112

		300, 700, 1100 Areas		
		300	700	1100
Power House (Buildings 384 and 784)				
Steam Generated - Total	M lb.	5997	10904	
Steam Generated - Ave. Rate	lb./hr.	8329	15144	
Coal Consumed - Total (est.)	tons	441	790	
Coal in Storage (est.)	tons	60	1339.5	
Sanitary and Fire System (1100)				
Well Water Pumped - Total	gal.			133764000
Well Water Per Day	gal.			4446000
Well Water	gpm ave. rate			3096
Chlorine Residual	ppm			0.2
Sewage Treatment Plant (1100)				
Total Treated	gal.			41300000
Treated Per Day	gal.			1377
Ave. Rate	gal.			956

Note: Only water and steam flows metered are (1) Water to Filter Plants, (2) Water to Piles, and (3) Steam from Boilers. Other figures are best estimates.

[redacted]

MAINTENANCE DEPARTMENT

MAY 1946

GENERAL

The backlog of Maintenance work has decreased approximately 12% during the month, while the total force has been reduced approximately 4%.

Work Order Summary:

Area	Work on Hand Apr. 25 No. of Orders	Work on Hand Apr. 25 Estimated Man Days	Work Completed in May No. of Orders	Work Completed in May Estimated Man Days	Work on Hand May 25 No. of Orders	Work on Hand May 25 Estimated Man Days
100-B	180	364	212	373	98	202
100-D	36	189	276	523	55	232
100-F	95	227	191	404	91	201
100 Shops	79	609	229	921	67	455
200-E	167	585	428	932	151	447
200-W	272	991	470	1156	275	909
300	137	477	211	604	159	514
700-1100	937	2596	1184	3569	640	2325
Totals	1903	6038	3201	8482	1536	5285

100 AREAS

The Nos. 13,16 and 35 vertical thimbles in the D Pile Unit were re-checked for leaks, after a new type rubber seal for the rod guides was installed. Tests were satisfactory and no replacements were made. The No. 27 vertical thimble in the B Pile Unit, which has been just recently installed, was removed from the unit so that the Technical Department could observe the condition of the Pile packing.

Horizontal rods No. 2 and No. 9 were removed from the B Pile Unit to permit boroscoping of the thimbles.

In conjunction with the work the Technical Department is doing, a special brackett has been installed on the B Pile Unit to support a transit in a rigid position so that the side movement of the horizontal water tubes can be measured.

In the D Pile Building, all vertical rod winches were given a visual inspection and routine adjustments and oil samples were taken. Winch No. 14 was replaced with a spare. It is planned to completely disassemble this unit to determine the extent of wear and its mechanical condition. Lubricating oil was changed in the vertical safety rod winches and the horizontal rod accumulator system in the B Pile Building when samples tested showed a critical value of acidity.

The south guide rail on D elevator in the D Pile Building is showing excessive wear over entire length of the guide. A complete inspection will be made during the next shutdown.

1201157

In the F Pile Building, all horizontal rods were inspected for scratches and evidences of rubbing. Rod No. 2 was found to be rubbing in the thimble through the wall between the inner and outer control rod rooms and was realigned to correct this. The other rods were found to be in good condition.

Leakage tests of the B Retention Basin have indicated somewhat more than normal leakage because of the cooler water contracting the concrete walls causing some slight opening of construction joints. It is planned to do additional caulking of vertical walls.

In the F Process Pump House, alignment checks and adjustments were made on all electric and all steam pumps. Only minor adjustments were required on a few units.

During a routine inspection, the speed reducer on the No. 6 Refrigeration Unit in D Refrigeration Plant was found to be knocking. Upon inspection, it was found that the bearings were not properly fitted and the thrust collars were scored. Bearings were scraped for proper fit and thrust faces were re-machined and trued-up. This eliminated the knocking.

In the B Power House No. 3 and 4 boilers were completely overhauled and put in "lay-away" condition. It was necessary to remove one leaking two-inch boiler tube from No. 1 boiler and plug the hole in the drums by rolling in tube hole caps.

The No. 4 boiler feed pump in the D Power House was completely overhauled, after bearings had been burned out on this unit. Bearing failure was due to breaking of the drive coupling on the lubrication pump. All bearings were replaced and other normal repairs made.

An air filter was installed in the discharge line from the steam-driven air compressor in the F Power House. This was necessary to keep lubricating oil from carrying over into the air system.

In the B Filter Plant, the "lay-away" of the designated equipment has been completed. This includes approximately one-half of all the chemical feeding and basin equipment.

The repairing of leaks in the F Filter Plant clearwells is being continued. The results so far have been favorable as the quantity of water entering the underground sewer has been considerably decreased. The leak previously reported piped into the Pump House has been completely stopped.

The "lay-away" of designated pumps in the B Reservoir Pump House has been completed.

The overhaul of No. 7 filter supply pump in the F Reservoir Pump House has been completed. It was necessary to renew the shaft sleeves which were badly worn by the packing.

In the B River Pump House the steam turbines and gear reducers were thoroughly cleaned, lubricated and put in "lay-away" condition.

200 AREAS

A broken spring in the vent valve on gang valve assembly 3-5R in the T Canyon Building was replaced. Failure of this spring caused a release of acid fumes into the operating gallery. A program is underway to inspect and repair all gang valve assemblies.

Connector assembly No. 33 was fabricated for B Canyon Building to replace one at section 7 which is suspected of clogging. A new cable was installed on the ten-ton hook on the 75-ton crane to replace the one that was kinked.

The overflow line from E-2 to E-3 in the T Concentration Building was replaced with a standard shop fabricated bend. The old line failed in a butt weld.

The drive head removed from E-2 centrifuge in the B Concentration Building has been repaired and installed on B-2 centrifuge.

The still column in No. 4 cell in the Isolation Building was replaced by one fabricated in the shop. The column failed in a weld near the top flange.

The Troy steam engine in the Isolation Building was overhauled. A new bearing was installed on the crank shaft, and the piston and valve rods were metallized and refitted.

A temporary combination steam and water syphon arrangement was installed at the U Plant Waste Storage to facilitate transferring contents of the tie line to storage.

Cask car locking devices have been sticking due to corrosion and sand. Several have been disassembled, cleaned and repaired.

The 24" tile waste water line in East Area developed a leak at its junction with valve box at the Waste Storage ponds. Investigation revealed a cracked bell in the imbedded section through the concrete wall. The bell was further incased in concrete in an effort to seal the leak.

In the West Power House the vent condenser was completely retubed with standard arsenical copper tubes. The old tubes were corroded at the hot and just inside the tube sheet. The Simplex control valve at the East Area Filter Plant was repaired by replacing a diaphragm and mechanical levers. The valve had been s ticking.

300 AREA

Routine overhauls were made on 14 furnaces in the Metal Fabrication Building during the past month. New crucibles were installed in all of the 14, pedestals were replaced in 5 and a new stainless steel pot was installed in one.

In the chip recovery room of the Metal Fabrication Building, the centrifuge was taken down and all argon leaks repaired. Changes were made to the argon feed lines and valves in order to produce the inert atmosphere more rapidly.

Eight-inch extensions were made to some of the outgassing containers in the Press Building. This was done in order to accommodate the longer rods being extruded.

The multi-port valve in the Water Softener Room of the Heating Plant was disassembled and valve surfaces machined. This was done to eliminate leakage of a considerable amount of soft water. Lubrication lines were run to the bearings of the dampers above the boilers which makes it possible for lubrication to be done from the cat-walks. This eliminates a safety hazard.

700-1100 AREAS

Sixty prefabs were disconnected for removal from the Project. A total of 517 have been disconnected to date.

There were 81 houses renovated during the month, and there are 78 orders on hand at the present time.

To date there have been 1017 prefabs spray-painted, of which 420 have been completed with trimming. Roofs of 107 prefabs have been painted with two coats of fire-resistant paint. Exterior painting on 54 permanent houses has been done.

The pump impellers on the irrigation system have been cut down so as to reduce the maximum pressure that can be placed on the system. Approximately 206 irrigation boxes and irrigation hose outlets were repaired. Also, 16,000 feet of hose has been delivered throughout the Village. This is being done to encourage wider usage of irrigation water.

PROJECT ENGINEERING

Projects - Work Completed in May

Proj. No.	Title	Estimated Cost
C-21	Additional Freon Receiver-York Unit-189-D Bldg.	$ 1,950
C-59	230 KV By-Pass for 251 Substation	6,400
C-75	Improved Cab Periscope-Building 105-D, Part II	1,550
C-78	Outside Electric Lines #503-Installation of Wood Strain Insulators	1,425
C-86	Warehouse #6 Washroom Facilities	900
	Total	$12,325

Projects Authorized and Under Construction

Project No.	Title	Percent Complete	Date Authorized	Estimated Cost
100 Areas				
C-2 9	Third Safety Device-Valve Replacement Buildings 105 B, D, F	55	6-25-45	$ 7,500
C-54	Installation of Strainers in High Tank Water Lines to Bldgs. 105-B, D, F	0	9-20-45	11,100
C-78	Pneumatic Charging Machines-Bldgs. 105 B, D, F	90	12-17-45	3,300
C-88	Installation of Ventilating Curtains Buildings 105-B, D, F	0	4-25-46	1,500
	Total			$ 23,400

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Project No.	Title	Percent Complete	Date Authorized	Estimated Cost
200 Areas				
C-40	Additions to Laundry Facilities Building 2723-W	25	4-12-46	$ 2,750
C-55	Sampler Clean-up Sink and Dryer Buildings 222 TUB	65	9-28-45	9,900
C-65	Alterations to 300 Sample Cans and Cases Building 231	95	11-7-45	3,750
C-67	Dismantle T.C. Extra Machinery Storage 200-W and T.C. Pipe Warehouse 200-E	25	11-26-45	3,000
C-69	Section 12-R Jumpers-Bldgs. 221 T & B	80	11-27-45	2,100
C-73	Process Waste Tie Lines from 241-T to 241-U & from 241-B to 241-C	98	12-17-45	22,350
C-77	Relocation of Monitoring Stations,200-E and West	85	12-17-45	1,950
C-80	Recycle Treatment-Buildings 224TUB,231-W	85	1-16-46	4,200
C-85	Additional Headtanks Cells 1,2,3, & 4	60	4-4-46	1,400
C-91	200-W Area Laundry, Bldg. 2723 Ventilation	0	5-19-46	1,000
	Total			$ 52,400
300 Area				
C-70	Chip Reclamation Facilities-Bldg. 313	95	12-20-45	$ 28,000
	Total			$ 28,000
700-1100 Areas				
C-79	Braces for Laundry Trays	80	1-16-46	$ 4,800
C-82	Columbia High School Transformer Relocation	0	2-28-46	725
C-84	Prefabricated House, 1118 Willard, Fire Damage Repair	10	3-15-46	800
C-87	Telephone Cable - Moisture Proofing	30	4-22-46	1,950
C-89	Barber & Beauty Salon Water Softener	0	5-7-46	1,050
	Total			$ 9,325
Plant General				
	None			
Grand Total - Work in Progress				$113,125

Engineering Studies

The following studies were completed and reports were issued:

Assist Technical Department in River Temperature Survey.
Reduce Head Developed by Irrigation Pumps at Low Output - Dwg. SK-11-115

5 | 20 | 61

Maintenance Department

Studies in progress at month-end were:

BY Tandem Telephone Building - Ventilation Revisions
Building 705 Hutment Alterations
Richland Electric Shop Hutment
Village Street Paving Completion
Pomona Pump Study
Downcomer Surge Study
Graphite Expansion Committee Study
Plumb Bob Installations - 105-F
Additional Solution Preparation Facilities (Project out for approval)
Repair Equipment for 291 Fans
Replacement Equipment for 291 Fans
Investigate Drive on 200-N Crane
Additional Waste Disposal Facilities 231 Building (Project out for approval)
Paint Standards
Transportation Department - J. I. Sheets Heavy Equipment
Field Lubrication Work Sheets - 700-1100 Areas
Procedure for Control and Distribution of Gas Cylinders

[redacted]

GENERAL

Work Order Summary:

Area	Work on Hand Apr. 25 No. of Orders	Work on Hand Apr. 25 Estimated Man Days	Work Completed in May No. of Orders	Work Completed in May Estimated Man Days	Work on Hand May 25 No. of Orders	Work on Hand May 25 Estimated Man Days
100-B	41	128	58	168	35	107
100-D	45	201	98	313	41	199
100-F	34	153	81	292	22	140
200-E	72	229	88	328	60	203
200-W	87	346	86	288	85	320
300	31	92	75	146	38	103
700-1100	59	210	90	335	65	174
Distribution	123	588	150	844	117	756
Totals	492	1947	726	2714	463	2002

100 AREAS

The lay-away work in the 100-B Area is now practically complete with the exception of minor items and a few items which have been temporarily restored to service. The power demand for the area has dropped to 3800 KW and 1,590,000 KWH consumption. This is one-third of normal operation. The force in the 100-B Area has been reduced to three electricians and a groundman supervised by one foreman reporting to the Assistant Area Engineer in charge of the 100-F Area. The former Assistant Area Engineer in the 100-B Area has been transferred to the Distribution Group in charge of line and substation maintenance. The excess non-exempt personnel in the 100-B Area was transferred to the Distribution and 200 Area Groups.

In addition to routine maintenance work on all equipment, special repair work was required to resolder all field connections in the 2000 HP motors in the 189 Buildings in the 100-D and F Areas. This work was done following the failure of one motor during the initial start-up operation. Timers in the 183 Building were reconnected so that they can be readily removed and replaced by a spare unit and thereby reducing manual control time considerably. Grounds developed on the control circuit to the No. 1 cooler blower in the 115 Building in the 100-D Area. These grounds probably developed due to excessive strain on the wires when pulled in to conduit during construction. The inboard bearing on the No. 4 refrigeration motor in the 189-F Building developed a noise on May 15, and inspection revealed that the motor was .010" low causing the field to ride the inboard bearing thrust. The motor was raised, tested and placed in operation.

On May 22, 1946, both pile units in 100-D and F scrammed due to a power surge at 4:34 A.M. The surge was caused by burning structure and fault on the Midway-Walla Walla 115 KV line of the Bonneville Power System. Later, the same day, several additional voltage dips were observed on the 230 KV system

which originated from 230 KV faults between Midway and Grand Coulee. In one instance, a double circuit outage of the Coulee-Midway transmission line occurred but were immediately restored to service. Scram operation of the pile unit did not occur for the subsequent system disturbances, indicating the time delay devices were operating satisfactorily.

A 230 KV bushing on B-phase of the "Y" transformer at Station A-2, 151-B, developed an oil leak at the flange connection and was replaced by a spare unit. The defective bushing is now being repaired. Semi-annual inspection was completed on 230 KV OCB A-322 and A-382 and all 13.8 KV breakers were inspected and overhauled at Station A-2. Transformer inspection at the Classification Yard and Riverland substation and inspection and adjustment to all relays at Stations A-2 and A-6 were completed. Relay adjustments at Stations A-4 and A-8 were approximately 90% complete.

200 AREAS

One of the 40/10 HP centrifuge motors failed while being tested in the dummy cell in the shop. One of the rotor bars broke loose from its end ring and was thrown out by the centrifugal action into the winding end turns.

A scheduled inspection of the 50 HP, 2300 Volt pump motor in the Filter Plant revealed a cracked bearing. The bearing was replaced.

On May 22, 1946, there was a momentary interruption of service to the 200 Areas caused by lightning. The only effect in the areas was the stopping of some motors which had to be re-started.

No additional work has been done on Project C-77 for relocation of monitoring stations. Project C-40 for additional laundry facilities is 50% complete and electrical work in connection with Project C-67 for dismantling of warehouse is 50% complete.

Construction of the 230 KV by-pass at Station A-8 is complete. The project for installation of wood strain insulators on 230 KV dead-end structures is complete.

300 AREA

Service to the 300 Area was interrupted momentarily at about 4:30 A.M. on May 22, 1946 during a lightning storm.

Improvements were made to the container heaters in the extrusion press, Material Preparation Building. The changes consisted of an additional terminal block and refractory supports to decrease breakage.

Plans were made for the construction of jumpers for the purpose of supplying any feeders from any breakers in the 351-B substation in the event of serious damage to a breaker. Their construction is being held up until it has been determined whether or not a 440 Volt switchgear can be obtained for the replacement of the 2300 Volt equipment now in use in this substation.

An additional pole was installed and some of the burned conductors replaced on the 440 Volt overhead feeder to the Material Preparation Building on which the severe short circuit occurred last month.

[redacted]

There were no furnace failures during the month.

700-1100 AREAS

Electrical work on Project C-86 was completed during the month and 5% of the work on Project C-84 was completed.

During the month, 116 telephone instruments were installed and 101 instruments were removed in the Village. In the Plant Areas, 27 instruments were installed and 42 were removed.

Drop wiring and protectors were removed from 50 excessed prefabs. The project for installation of the gas pressure system on the telephone cables is approximately 30% complete.

The trouble due to a lightning storm on May 22 caused partial failure of the 11 pair cable between the 100-D and F Areas. A hole was burned in the lead cable sheath and several pair were put out of service. A number of station and branch protectors operated to protect various parts of the system from lightning voltages.

A variable tone generator was designed and constructed and is to be used in identifying pairs in cables and for indicating busy trunks during maintenance work.

The capacity of telephone equipment in the 200-E Area is occasionally overloaded and this condition is being studied to determine whether additional facilities are needed.

Electrical service was removed from 30 excessed prefabs. A constant current transformer setting was reconstructed adjacent to the Fire Hall.

The Radio Maintenance Group overhauled 58 mobile 2-way radio sets and serviced 62 radio sets. Four additional 2-way sets were installed.

POWER SUPPLY INTERRUPTIONS

Date	Area	Circuit Affected	Time	Duration	Remarks
May 3	100-D	C4-L16 13.8 KV Line	11:45 AM	Moment	Opened by Mistake
May 12	700	Street & Fence Circuit	7:00 PM	9:20 PM	Clock stopped
May 13	Riverland Substation	6900 V Line	2:03 PM	5:20 PM	Due to jeep running into phone line and wire hitting 6900 V
May 22	100-D	Interruption	4:33 AM	6:07 AM	BPA Trouble
May 22	100-F	Interruption	4:33 AM	6:07 AM	BPA Trouble

POWER STATISTICS - ELECTRICAL DEPARTMENT

FOR MONTH ENDING MAY 25, 1946

ITEM	ENERGY - MWHRS. APRIL	ENERGY - MWHRS. MAY	MAX. DEMAND - KW APRIL	MAX. DEMAND - KW MAY	LOAD FACTOR - % APRIL	LOAD FACTOR - % MAY	INCREASE OR DECREASE-% ENERGY	INCREASE OR DECREASE-% MAX.DEMAND
230 KV SYSTEM								
151 B Out	1640	1590	5000	3800	49.5	58.1	13.6 (d)	24.0 (d)
151 D Out	7960	6800	12800	15800	83.6	77.4	10.6	23.4
151 F Out	7160	7800	11100	14300	86.7	75.8	8.9	28.8
251 Out	2040	1840	3500	3400	78.3	75.2	9.8 (d)	28.0 (d)
TOTAL OUT	19000	20030	** 32400	** 37300	-	-	5.4	15.1
MIDWAY IN	19444	20556	* 30000	* 35600	87.1	80.2	5.7	18.7
Transm. Loss	444	526	-	-	-	-	-	-
Percent Loss	2.3	2.6	-	-	-	-	-	-
66 KV SYSTEM								
1151 A Out	2041	1339	4600	4100	61.0	46.3	34.4 (d)	8.8 (d)
1151 B Out	1782	1267	4300	3500	55.7	41.1	27.6 (d)	18.6 (d)
751 A Out	1848	1675	3468	3236	71.6	71.9	9.3 (d)	6.7 (d)
351 A Out	241	215	474	474	68.3	63.7	9.5 (d)	-
351 B Out	254	254	1080	1160	31.6	30.4	-	7.4
Hanford Out	232	232	500	500	64.4	64.4	-	-
TOTAL OUT	6398	5005	** 14322	** 12970	-	-	21.7 (d)	9.4 (d)
Hanford In	232	232	* 500	* 500	64.4	64.4	-	-
Pasco In	6186	4804	* 13200	* 12400	63.0	53.8	22.3 (d)	6.1
TOTAL IN	6418	5036	13700	12900	63.0	54.2	21.5 (d)	5.8 (d)
Transm. Loss	20	31	-	-	-	-	-	-
Percent Loss	0.3	0.6	-	-	-	-	-	-
PROJECT TOTAL								
230 KV (Item 5)	19000	20030	** 32400	** 37300	-	-	5.4	15.1
66 KV (Item 15)	6398	5005	** 14322	** 12970	-	-	21.7 (d)	9.4 (d)
TOTAL OUT	25398	25035	** 46722	** 50270	-	-	1.4 (d)	7.6
230 KV (item 6)	19444	20556	* 30000	* 35600	87.1	80.2	5.7	18.7
66 KV (Item 18)	6418	5036	** 13700	** 12900	63.0	54.2	21.5 (d)	5.8 (d)
TOTAL IN	25862	25592	* 41200	* 45200	84.4	78.6	1.0 (d)	9.7
Transm. Loss	464	457	-	-	-	-	-	-
Percent Loss	1.8	1.8	-	-	-	-	-	-

* Coincidental Demand
** Non-Coincidental Demand
(d) Denotes decrease

Average Power Factor - 230 KV System.....99.2%
Average Power Factor - 66 KV System.....94.0%

INSTRUMENT DEPARTMENT

MAY 1946

GENERAL

Work received in May was 6% less than that received in April.

Work Order Summary:

Area	Work on Hand Apr. 25		Work Completed in May		Work on Hand May 25	
	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days
100-B	29	41	55	131	41	54
100-D	48	131	109	335	49	144
100-F	53	138	109	361	50	163
200-E	67	125	245	316	45	122
200-W	69	91	270	319	51	86
300	73	279	110	372	60	241
700	48	117	102	179	46	111
Totals	387	922	1000	2003	342	921

100 AREAS

Horizontal bowing of a group of representative process tubes have been measured in the 100-B Area Pile. A transit was used to measure the displacement of a slug fitted with an illuminated scale as it was moved to various positions in the tube.

A large part of the shutdown program for 100-B Area has been completed. Activities for the month were principally centered in the power and water treatment buildings. Tests were run on revision of the control system for operation of boilers on natural draft.

During a previous period 250 pressure monitor gauges in the 0.175 orifice zone were recalibrated from the 25-125 psi range to a 50-150 range without change of scale. Present loading of the pile allows the revision of this arrangement. During the month 80 gauges were recalibrated to the 25-125 psi range.

200 AREAS

Installation of the 8 inch G.E. chamber on R-2 tank of the Concentration Building in West Area has been completed.

A leak was discovered in the dip tube for specific gravity measurement in F-7 tank of the East Area Concentration Building. This was causing incorrect measurements. New tubes are being fabricated for replacement.

The improved table design of fourfold counter has proved satisfactory in the West Area Laundry. Two additional units are being revised according to these plans.

Seven "Poppy" survey instruments received from Clinton Laboratories were placed in service; three in the Isolation Building and two each in the H. I. laboratories in the Field Service Buildings.

A three wire probe has been installed with carrier and guard on a "Poppy" survey instrument buggy. The probe will be carried 3/16 inch above the floor. This arrangement is being tested in the East Area Control Laboratory for use as a floor monitor unit.

300 AREA

A mounting device for use of resistance type strain gauges in the measurement of deflection in 100 Area process tubes is under construction.

An underwater viewer was fabricated for use in 100-F Area.

700 AREA

A cable shock absorber designed to eliminate breakage of cables driving remote recording Sparling water meters has been installed in No. 13 Well House. This will allow remote operation of the pump without meter damage.

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PROTECTION DEPARTMENT

MAY 1946

PATROL DIVISION

General

Labor turnover in the Patrol Division was 0.9% during May.

Plant Areas

Eight Special Duty escorts were handled.

Requests handled totalled 886, mainly consisting of escorts, opening doors and gates for employees of other departments.

A total of 323 Unusual Incident Reports was received, which consisted mainly of unlocked and open doors, windows and files, and traffic violations.

A practice evacuation was held in the 100-D area on May 8, 100-B area on May 22 and in the 100-F area on May 24.

The post maintained at the 105-B Badge House was discontinued on May 6.

A telephone was installed at the 100-F area Railroad Gate on May 14 expediting the entrance of railroad equipment.

On May 13, the 200-West area patrol assumed the responsibility of issuing class "B" and "C" Temporary Badges and pencils during the 12:00 to 8:00 A.M. shift and the lunch period of the H. I. group.

Training

Advanced training at the Patrol Small Arms Range was continued, and qualifications in Army "L" Course firing were as follows:

	April		May	
	No.	Percent	No.	Percent
Unqualified	33	9	32	11
Marksman	119	34	102	34
Sharpshooter	70	20	62	20
Expert	130	37	104	35
Totals	352	100	300	100

The Sub-Machine Gun Course was eliminated during the month of May.

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Upon completion of Area competition for this period, awards were presented as follows:

High Team Average	283.8	200-West
High Area Average	237	100-B
High Individual Score	289	Richland

A 16-MM movie projector with sound equipment was received from the 9th Service Command for use in connection with the training program.

Richland Area

	April	May
Check on absentees	1	3
* Persons assisted	217	235
Doors and windows found open in commercial facilities	18	37
Lost children found	15	17
Ambulance runs	46	37
Lost dogs reported	8	5
Dog and cat complaints	39	34
Persons injured by dogs	0	17
Totals	344	385

* Includes: Escorts from Cashier Office and Bus Terminal to Bank; persons admitted to residence; transportation for nurses and technicians to Hospital on special night calls; delivery of messages to residents who have no telephone; and opening Trailer Parking Lot for individuals.

Traffic and Offense Statistics

These are presented in separate tables at the end of this departmental report. A comparison of Richland Offense Statistics with outside averages also is presented.

SECURITY DIVISION

General

The method of showing classified building access in the 300 Area was revised on May 13, 1945. The Cold Semi-Works Building is not in operation, and is locked at all times, except for necessary service or inspection details. Likewise, access to the Standards Building is controlled by supervision since entrance to this building remains locked at all times. Access approval to the three remaining classified buildings, viz., Test Pile Building, Metal Fabrication Area and the Technical Building, are now identified by vari-colored triangles clamped in the corners of the photographic section of the Area Badge. This method of identification, not only facilitates entrance to these classified areas, but also assists in the challenging program that is in effect in the buildings.

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Protection Department

Security Education

Security Bulletin No. 15, entitled, "Closed" Area Boundaries, with an attached "Closed" Area Map, was issued under date of May 7, 1946. Since this bulletin related to locations in which picnicking, fishing and other recreational activities were not permitted, it was of interest to all village residents, and was distributed among the village concessionaires as well as du Pont employees. It was also quoted, in part, in the "Sport's" column of the May 16 issue of the Villager.

New security posters referring to "Atomic Power", were posted throughout the plant area during the month of May.

A total of 355 Security Meetings were held and attended by 4740 employees throughout the entire plant and administration areas during the period of April 26, 1946 to May 27, inclusive.

Plant Visitors

Name-Organization	Purpose of Visit	Access to Areas: Classified	Access to Areas: Unclassified
Wilmington Office Personnel			
R. M. Evans, Manager TNX Division E. I. du Pont de Nemours & Co. Wilmington, Delaware	Company business	X	
J. N. Tilley, Asst. Manager TNX Division Explosives Department E. I. du Pont de Nemours & Co. Wilmington, Delaware	General inspection and consultation with Plant Manager.	X	
Allied Project Personnel			
Lt. Royce D. Tebbet U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation on health problems	X	
Lt. Meredith Mallory U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation on health problems	X	
Lt. Melvin A. Block U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation on health problems	X	
Lt. James E. Coleman U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation on health problems	X	

Allied Project Personnel (Continued)	Purpose of Visit	Access to Areas Classified	Access to Areas Unclassified
Lt. Grover C. Carter U.S.Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation on health problems	X	
Capt. H. F. Phillipsborn U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Major Jack Comstock U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Lt. Alfred Neverick U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Major L. D. Geiger U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Capt. John R. Smith U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Capt. A. L. Vadheim U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Capt. William N. Sullivan U.S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Lt. S. R. Pinas U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Capt. D. C. Tasher U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	

Allied Project Personnel (Continued)	Purpose of Visit	Access to Areas Classified	Access to Areas Unclassified
Major Roy D. Maxwell U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Capt. Francis Donoghue U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	Consultation	X	
Dr. George Weil Metallurgical Laboratory University of Chicago Chicago, Illinois	Consultation	X	
E. L. Feninger U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
John Howe U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
W. H. Milton U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
A. L. Marshall U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
K. H. Kingdon U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
G. C. Suits U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
H. A. Winne U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	

Allied Project Personnel (Cont'd)	Purpose of Visit	Access to Areas: Classified	Access to Areas: Unclassified
Lt. Col. A. D. Arnold U. S. Engineers Office Manhattan District Oak Ridge, Tennessee	General Inspection	X	
Outside Service Personnel			
M. E. Bennett Baldwin Locomotive Works San Francisco, California	Inspection of diesel locomotives		X
A. L. Leonard International Harvester Co. 715 E. Sprague Street Spokane, Washington	Inspection		X

Statistical Summary

	April	May
Number of employees cleared for classified information	25	33
Number of visitors cleared for classified information	0	0
Number of authorization cards issued to employees	17	58

Number of employees having access to each classified area as of month-end were (A, B and C denote type of clearance):

	April				May			
Area	A	B	C	Total	A	B	C	Total
100B	498	563	316	1377	400	595	338	1333
100D	665	535	366	1566	660	531	347	1538
100F	703	478	375	1556	702	480	355	1537
200E	715	711	355	1781	713	707	331	1753
200W	905	645	329	1879	901	660	304	1865
200N	61	404	179	644	63	406	177	646
300	585	539	182	1306	578	537	170	1285

	Temporary Access	
Area	April	May
100B	14	39
100D	15	46
100F	16	40
200E	10	46
200W	17	46
200N	7	28
300	28	45
Total	107	290

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INVESTIGATION DIVISION

Investigation

The following summary reflects the work of this Division:

	April	May
Cases pending at beginning of month.....	* 232	220
Cases received during month.....	361	225
Cases closed during month.....	373	352
Cases pending at end of month.....	* 220	93
Number of employees approved for clearance.....	25	33
Construction personnel files reviewed for transfers.....	59	34
Number found satisfactory for employment.....	55	36
Number found unsatisfactory for employment.....	0	4
Number of Personnel Security Questionnaires concerning concessionaire employees processed and forwarded to Military Intelligence Office without investigation...	118	40

* The difference in these numbers and those in the report of April, 1946, is due to the correction of an error found in the report of October, 1945.

PATROL DIVISION - RICHLAND OFFENSES

Classification of Offenses	Offenses Known or reported to Patrol	Offenses Unfounded	Actual Offenses Apr.	Actual Offenses May	Offenses Cleared By Arrest	Offenses Cleared By Other Action	Perpetrators Involved
Assault	0	0	0	0	0	0	0
Attempted Suicide	0	0	1	0	0	0	0
Burglary-Breaking and/or Entering	1	0	0	1	0	0	(u)
Larceny-Theft (except auto & bike)							
(a) $50.00 and over value	0	0	1	0	0	0	0
(b) Under $50.00 value	12	2	5	10 (a)	0	4	4
Auto Theft	0	0	3	0	0	0	0
Bicycle Theft	2	1	1	1	0	0	(u)
Tricycle Theft	1	0	0	1	0	0	(u)
Destruction of Government Property	1	0	3	1	0	0	(u)
Destruction of Personal Property	2	0	2	2	0	0	(u)
Disorderly Conduct	2	0	1	2	0	2	3
Drunkenness	6	0	3	6	6	0	6
Missing Persons	1	1	2	0	0	0	0
Offenses against family & children	1	0	0	1	0	1	1
Prowlers	2	1	0	1	0	0	(u)
Rape	0	0	0	0	0	0	0
Sex Offenses	1	0	1	1 (b)	1	0	1
Vagrancy	0	0	0	0	0	0	0
Miscellaneous	5	1	2	4	0	2	2
Juveniles (other than reported above)							
Disorderly Conduct	6	0	10	6 (c)	0	6	9
	43	6	35	37	7	15	26

(a) - Two of the offenses were perpetrated by two juveniles, of ages 13 and 16 years.
(b) - The one offense was perpetrated by a juvenile, of age 16 years.
(c) - The six offenses were perpetrated by nine juveniles, of ages 7, 8, 9, 13, 15 and 16 years.
(u) - Represents "unknown".

Value of property recovered from April 25 through May 25 was $172.53 (includes two bicycles).

Protection Department

PATROL DIVISION - COMPARISON CHART OF 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 Average	One Month Average	Six Months (July-Dec. 1945)	April	May
Murder	0.225	0.037	0	0	0
Robbery	5.32	0.89	0	0	0
Aggravated Assault	2.49	0.615	0	0	0
Burglary	30.97	5.16	7.33	0	0.66
Larceny	86.08	14.34	63.33	4.66	8.0
Auto Theft	23.96	3.97	6.66	2.0	0

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

	State of Washington		Richland		
Classification	Six Months Average	One Month Average	Six Months (July-Dec. 1945)	April	May
Murder	0.215	0.036	0	0	0
Robbery	3.62	0.6	0	0	0
Aggravated Assault	1.17	0.19	0	0	0
Burglary	27.8	4.63	7.33	0	0.66
Larceny	81.22	13.53	63.33	4.66	8.0
Auto Theft	24.04	6.0	6.66	2.0	0

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

		Richland		
Classification	National Average (1945)	Six Months (July-Dec. 1945)	April	May
Robbery	58.6%	0	0	0
Burglary	64.4	63%	0	0
Larceny	49.6	27	43%	17%
Auto Theft	80.3	20	66	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 arrest records is doubtless incomplete in the lower age groups because of the practice of some jurisdictions not to fingerprint youthful offenders."

In Richland every delinquent juvenile is entered in the records.

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PATROL DIVISION - TRAFFIC CONTROL STATISTICS

Motor Vehicle Accidents

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	April	May	April	May	April	May	April	May
Plant	1	0	0	0	0	0	0	0
Richland	10	11	0	0	0	0	2	2
Totals	11	11	0	0	0	0	2	2

Accident Causes

	Negligent Driving		Failure to Yield Right-of-Way		Reckless & Drunken Driving		Miscellaneous Causes	
	April	May	April	May	April	May	April	May
Plant	0	0	0	0	0	0	1	0
Richland	7	6	2	2	2	2	1	2
Totals	7	6	2	2	2	2	2	2

Plant Warning Traffic Tickets Issued

	Speeding		"Stop" Sign		Parking		Improper License		Defective Equip.		Totals	
	April	May	April	May	April	May	April	May	April	May	April	May
Plant	6	3	1	0	0	0	0	0	3	0	10	3
Richland	17	21	21	12	215	112	55	13	63	45	371	203
Totals	23	24	22	12	215	112	55	13	66	45	381	206

Court Citation Traffic Tickets Issued

	Speeding		"Stop" Sign		Drunken Driving		Reckless Driving		Negligent Dr.		Other Violations		Totals	
	April	May	April	May	April	May	April	May	April	May	April	May	April	May
Plant	4	3	1	1	0	0	0	0	0	0	0	1	5	5
Richland	6	10	6	14	2	2	1	1	5	3	9	6	29	36
Totals	10	13	7	15	2	2	1	1	5	3	9	7	34	41

Traffic Volume

	April	May
Richland - Downtown Street (average car count - 24 hour period)	10,237	10,783

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SERVICE DEPARTMENT

MAY 1946

PLANT SERVICE

PERSONNEL

Department	Roll Additions	Inter-Dept. Transfers In	Inter-Dept. Transfers Out	Roll Terminations	Net Roll Change
Management	-	-	-	-	-
P Department	-	-	-	19	- 19
S Department	-	-	-	1	- 1
Technical	9	-	4	28	- 23
Power	1	-	-	8	- 7
Maintenance	1	-	-	19	- 18
Electrical	-	-	-	3	- 3
Instrument	-	-	1	1	- 2
Protection	1	-	3	6	- 8
Service	8	2	-	11	- 1
Transportation	2	-	1	30	- 29
Medical	9	4	-	14	- 1
Accounting	-	3	-	19	- 16
Totals	31	9	9	159	- 128

Roll Additions

	Exempt	Non-Exempt	Total
New Hires	-	13	13
Re-employs	2	2	4
Reinstates	-	4	4
Other Plant Transfers	1	-	1
Net Additions	3	19	22
Payroll Exchanges	9	-	9
Gross Additions	12	19	31

Terminations

Another Job	5	17	22
Dissatisfied with Job	-	3	3
Personal Illness	-	3	3
Illness in Family	-	1	1
Pregnancy	-	1	1
Getting Married	-	2	2
Going Home	-	3	3
Husband Leaving Project	-	3	3
Husband Returning from Service	-	1	1

	Exempt	Non-Exempt	Total
Voluntary Unexplained Absence	-	3	3
Deceased	-	1	1
Reduction of Force	5	54	59
Transfer to Other Plants	13	9	22
Discharge	-	4	4
Other	2	20	22
Net Terminations	25	125	150
Payroll Exchanges	-	9	9
Gross Terminations	25	134	159

Approximately 19% of all terminations occurred in the Transportation Department; 18% in the Technical Department and 12% in the P Department, Maintenance Department, and Accounting Department.

Personnel Turnover	April	May
Total Turnover	3.53%	3.36%

Plant Absenteeism (Non-Exempt)		
Male	1.75%	1.91%
Female	3.15%	2.69%
Plant Average	2.03%	2.06%

Non-Exempt Personnel - Interviews		
Accepted	8	19
Rejected	235	196
Others	250	197
Total Interviews	493	412

Non-Exempt Personnel - Placed on Roll		
Current Month Interviews	8	19
Previous Month Interviews	7	-
Total Placed on Roll	15	19

Military Service Personnel (World War II)	May	To Date
Employees Entering Military Service	-	151
Employees Returned from Military Service	2	34
Employees of Other du Pont Plants Added to Roll	-	39*
Other Veterans Hired	4	404**
Total	6	477

*This figure was increased one over last month's total to compensate for an error in classification.

**This figure has been increased by one in excess of the four additions during May, 1946 to cover a veteran hired in October, 1944 who was omitted from the total count.

SELECTIVE SERVICE

Number of 4F, 2A(F) and 2B(F) Classifications	54
Number of 1C's	114
Number of male employees 18-25, excluding 4F, 2A(F), 2B(F) and 1C Classifications	35
Total number of male employees under 26	203

CENTRAL FILES

	April	May
Classified Documents Received (In Mail)	187	141
Unclassified Documents Received (Total)	2,985	2,422
Classified Documents Issued	3,050	2,081
Inter-Area Transfer (Classified)	3,696	3,236
Documents Routed (Classified)	4,696	4,204
Requests - File Documents (Classified)	886	860
Requests - Technical Library	84	119

SAFETY AND FIRE PROTECTION

Safety

Plant Safety Record - 135 Days

Injury Statistics	April	May	Year to Date
Major Injuries	-	-	1
Non-Tab. Major Injuries	-	-	1
Sub-Major Injuries	1	3	12
Minor Injuries	251	237	1230

Sub-Major Injury No. 61

April 29 - (Power Department, 100-D Area), sustained a chip fracture of the hamate bone of the wrist. Injured was attempting to clean the exterior of a pump. He turned the timer switch on the pump to what he thought was "off" position, then removed the guard and started to wipe the pump body. Meanwhile the pump started automatically and caught the injured's hand between the rocker arm and the piston of the pump.

Sub-Major Injury No. 62

May 10 - (Power Department, 100-D Area), aggravated an arthritic condition, causing his knee to become swollen and painful. Injured was cleaning around a pump when his foot slipped causing his right knee to strike the beveled edge of the pump base.

Sub-Major Injury No. 63

May 23 - ("S" Department, 200-W Area), sustained a transverse fracture to the distal phalanx left index finger. Injured was lifting a 300# barrel over a railing with a Mercury Industrial Hoist truck. He climbed on the prongs holding the barrel and found he had lifted it too high. With

his right foot on the railing, his left hand on the telescopic beam of the truck he used his left foot to move the gear shift to the position for lowering. His left index finger was caught between the stationary beam and the telescopic beam.

Minor Injuries

See charts appended to this departmental report.

A total of 495 Safety Meetings were held, with an attendance of 6,654.

The 100-F Area and the 200-E Area were each presented a safety plaque and safety flag with one star for completing one year without a lost-time injury. Safety award cards were given to each employee of these Areas.

The first issue of the bi-monthly Plant Safety publication "The Life Line" was distributed to all employees Friday, May 17.

The monthly inspection of all schools was conducted on safety, health, housekeeping and fire. Jefferson School, having the highest rating, was awarded the safety flag for the month.

The Transportation Department received several new pieces of heavy equipment and these pieces are being gone over carefully for guarding and unsafe conditions.

A safety meeting was held at the Morrison Knudsen Labor Camp in Benton City.

Light green face shields have been put into use for operators in the 300 Area who do close inspection work and who work in dark rooms. This has eliminated the majority of the complaints of headaches and eye strain after employees come inside out of bright sunlight.

Training subjects covered in the weekly meetings of the Safety Engineers and Fire Department Supervisors were "The Safe Handling of Materials" and "Railroads in Industrial Plants."

The "Look and Tag Procedure" was emphasized at all safety meetings.

Fire Protection

Fires

	Number of Fires		Estimated Damage	
	April	May	April	May
Village	10	6	$54.95	$65.00
Plant	13	7	10.00	-
Miscellaneous	4	6	-	-
Totals	27	19	$64.95	$65.00

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Majority of above fires were of a minor nature. The approximate $65.00 Village fire damage was the result of two fires; one caused by a burning cigarette in trash wagon located 50-feet away from east side of Recreation Building and the other in the kitchen of home located at 1006 Perkins, probably spontaneous ignition in chemically treated paper waste sack in which blaze damaged window frame and smoked small section of wall.

Fire lanes are being cut around all tract houses and roads to help retard serious grass fires from damage to properties.

The inspection of homes for fire hazards in the Village was started on May 14 and the progress is satisfactory. Forty-eight homes have been inspected this month.

Recommendations were submitted to representatives of Village Organization covering the elimination of definite fire hazards in Richland Commercial Garage; also alteration to lint exhaust duct from dryer in Richland Laundry. Additional recommendations were also submitted in which the use of burning candles, open flames and flammable materials for decorative purposes in all public buildings, including churches, was considered a definite fire hazard and should be prohibited except where special permission was granted upon application to the Fire Protection Division.

Four groups of children from public schools were shown through Fire Station #1 and were instructed in the various methods of approach and attack in fighting fires.

Arrangements are being completed to have the Fire Division inspect and service all gas masks on the Works and in the Village.

INDUSTRIAL RELATIONS AND TRAINING

Contacts are summarized as follows:

	April	May
Policy	15	23
Military Service	1	-
Insurance	3	5
Housing	26	24
Personal	27	23
Income Tax	6	3
Miscellaneous	26	17
Municipal (Facilities)	-	1
Total	104	96

Welfare Section

Two plant softball leagues were organized. The 200 Area league consists of eight teams comprising approximately 147 players. The Village league consists of six team comprising approximately 100 players.

1201183

[redacted]

Schedules have been set up and fields reserved and both leagues have formed their own official organization to handle any funds, disputes, etc., and have made written request to Villagers, Inc. for partial financial assistance. The 200 Area league started its schedule on May 27 and the Village league was to get under way on June 3.

GENERAL DIVISION

Laundering volumes were as follows:

Plant Laundry (Bldg. 2723)	April	May
Coveralls - Pieces	16,569	14,264
Towels - "	5,544	4,872
Miscellaneous "	21,376	21,910
Total Pieces	43,989	41,046
Total Dry Weight - Lbs.	65,224	57,862
700 Area Laundry (Bldg. 723)		
Flatwork - Pieces	35,986	30,947
Rough Dry - "	18,763	18,729
Finished - "	2,217	1,990
Total Pieces	56,966	51,666
Total Dry Weight	32,470	29,450

VILLAGE ADMINISTRATION

HOUSING

Permanent Village Houses

	Family Occupancy Figures		
	Moved In	Moved Out	Month End
Du Pont	65	66	2165
Government	22	9	170
Totals	87	75	2335

Summary:

Houses occupied by family groups	2335
Houses utilized by Housing Section	2
Houses utilized by Medical Department (Public Health Section)	1
Houses assigned but unoccupied pending arrival and installation of furniture	9
Houses available for assignment	148
Government houses without lease in du Pont possession exclusive of authorized rent-free houses	5
Total Houses	2500

Service Department

Prefabricated Houses

	Family Occupancy Figures		
	Moved In	Moved Out	Month End
Du Pont	7	61	1124
Government	16	2	80
Totals	23	63	1204

Summary:

Houses occupied by family groups		1204
Unoccupied pending installation of effects and arrival of families		2
Houses available for assignment		22
Government houses without lease in du Pont possession		-
Total Prefabs (active)		1228
Closed and available for excess		38
Turned over to excess	536	
Removed from Project	471	
Awaiting removal		65
Total Prefabs on Project		1331
Total Prefabs moved from Project during month		138

Tract Houses

Occupied	55	(Includes occupancy by du Pont, Government, sub-contractors and concessionaires, in Richland and vicinity.)
"	10	(Includes occupancy by Bonneville Power in Priest Rapids and White Bluffs.)
	1	(Special - fumigation)
Vacant	42	
Total	108	(Includes Richland, Priest Rapids and White Bluffs.)

[redacted]

Occupied by men	6	
Occupied by women	7	
Assigned to Community Organizations	3	(1 to Teen-Age Club; 1 to Youth Council; 1 to Pre-School Nursery.)
Held as emergency additional hospital accommodations	1	
Vacant	8	
Total	25	

(Dormitory M-6 opened May 8, 1946, under lease to Mohawk Trucking Company.)

Service Department

COMMERCIAL FACILITIES

Operation

Progressive Cafeterias	April	May
Cafeteria Meal Customers	35,097	32,729
Total Dollar Sales	15,149	14,399
Per Cent of room-day occupancy, Transient Quarters	91.40%	90.40%

Carnation Company		
Gallons of milk sold	50,731	45,597
Gallons of cream sold	1,371	1,123
Gallons of ice cream sold	2,168	3,496
Pounds of Cottage Cheese sold	1,590	1,070

"Richland" and "Village" Theaters		
Customer Count	42,622	41,697

Gasoline Sales	March	April
Total gallons, all stations	87,055.6	101,618

General

The results of the comparison of drug store prices among stores in Richland and the outlying territory were transmitted to the Area Engineer, indicating Richland prices to be well in line with the surrounding territory, with prescription prices slightly lower in Richland.

Commercial facility buildings were checked in accordance with the requirements of the State Department of Labor as to compliance with standards as regards toilet facilities, rest rooms, etc. No particular difficulty in meeting State requirements is apparent.

A project has been approved for the installation of water softening equipment at the Barber Shop and Beauty Salon.

COMMUNITY ACTIVITIES

Schools

The total enrollment for School District No. 400 as of May 23 was 3,029, which is 133 pupils less than the peak enrollment of September, 1945.

The obligations of the School District relative to the maintenance of school grounds has been redefined and the school authorities duly notified.

General

The "Richland Win the Peace" drive was ended on May 3, 1946, at which time various Richland organizations contributed funds raised for Tiel, Holland, totaling nearly $2,000.00. The relief drive resulted in the collection, packing and shipping of 8,580 pounds of canned foods and 12,860 pounds of clothing.

Approximately $3,000.00 was collected during the Cancer Drive conducted by the Junior Chamber of Commerce. This was 400% of the quota.

The following new organizations were approved as recognized community groups during the month:

Richland Branch of the Columbia River Shrine Club
Richland Branch of the Veterans of Foreign Wars of the U.S.
Toastmasters Club of Richland
Gospel Song Hour

VILLAGE - GENERAL

The County Commissioners of Benton County have revised the voting districts in Richland to provide for seven precincts, with voting places at the five school buildings, the Recreation Hall and the Grange Hall (Lutheran Church).

A project has been requested to provide for the finished paving of uncompleted streets in the northwest section of the Village.

7-4193

[redacted]

MONTHLY INJURY ANALYSIS

Period - April 26 through May 25, 1946

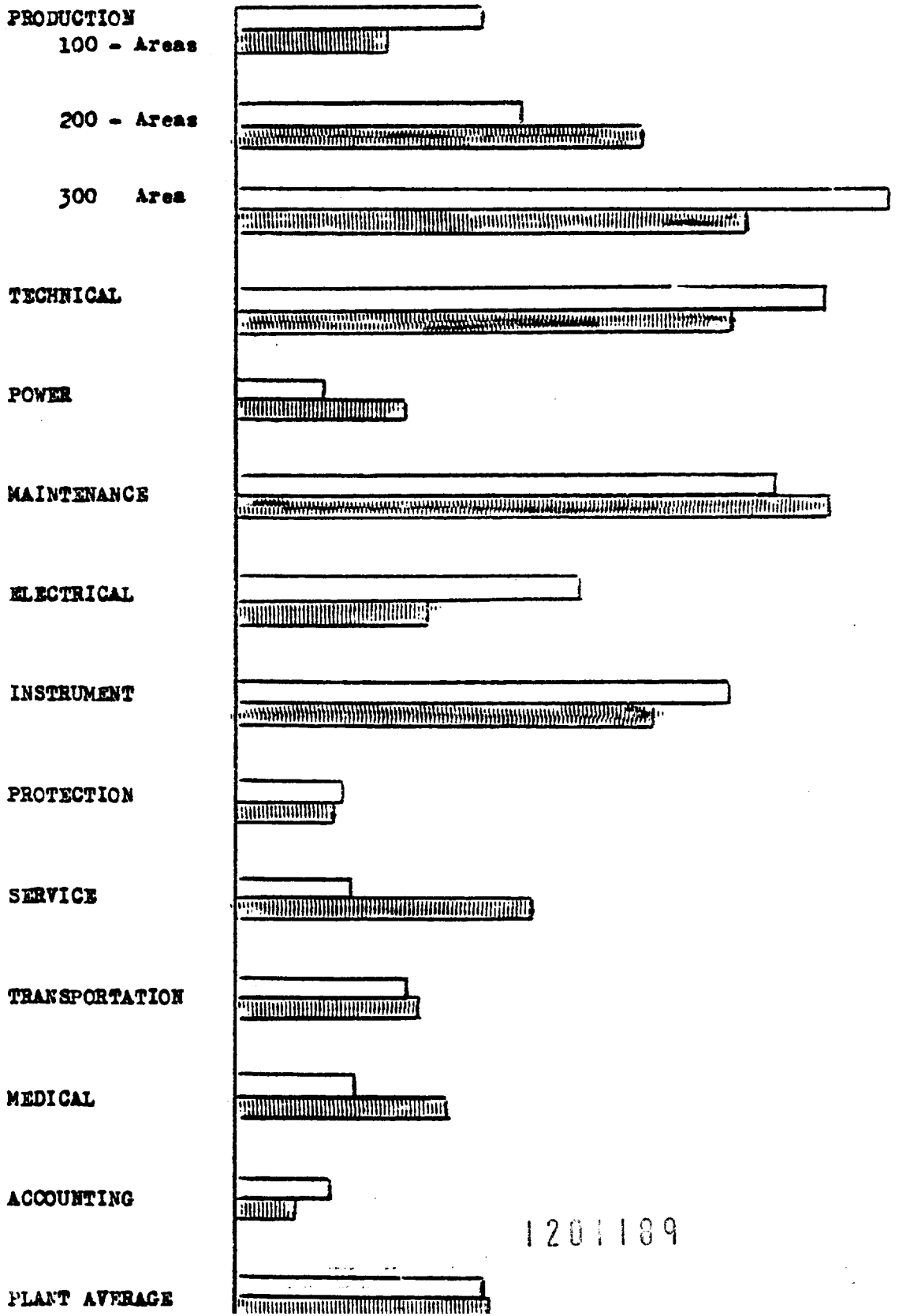
Minor Injuries

	Misc. Burns	Abrasions	Contusions	Lacerations	Punctures	Splinters	Strains & Sprains	Foreign Body	Unclassified	TOTAL MAY	TOTAL LAST MONTH
Production P	3	0	4	3	0	1	0	3	2	16	26
S	4	10	4	6	1	2	1	0	1	29	21
Technical	3	7	0	8	3	0	0	0	2	23	33
Power	2	1	2	5	0	0	0	5	2	17	9
Maintenance	9	14	7	21	2	4	1	1	6	65	65
Electrical	2	1	2	1	0	0	1	1	0	8	16
Instrument	0	5	0	4	1	2	0	0	1	13	16
Protection	1	3	1	3	0	0	1	0	0	9	9
Service	0	1	2	2	0	2	0	0	4	11	[illegible]
Transportation	1	5	0	9	0	3	0	0	4	22	21
Medical	2	5	1	4	0	3	0	0	1	16	12
Accounting	0	0	2	3	0	1	2	0	0	8	[illegible]
TOTAL	27	52	25	69	7	18	6	10	23	237	247

Last Month

This Month

MAY
FREQUENCY RATE CHART
Minor Injuries



TRANSPORTATION DEPARTMENT

MAY 1946

RAILWAY AND AUTOMOTIVE OPERATIONS

A further reduction of automotive equipment inventory was effected with two units being declared excess.

Under the program of disposing of and exchanging non-standard types of automotive units and replacing those worn beyond economical repair, twelve units have been exchanged since April 25, 1946.

Off-the-plant automobile trips (Company business and official visitors) totaled 38.

Comparative figures for plant bus trips are:

	Average Daily Trips	
	April	May
Passenger Buses - 100-B	13	9
Passenger Buses - 100-D	12	11
Passenger Buses - 100-F	13	12
Passenger Buses - 200-W	18	18
Passenger Buses - 200-E	13	13
Passenger Buses - 300	8	8
Inter-area passenger service (stretchouts)	3	3
Inter-area express service (1 panel delivery)	1	1
Inter-area mail service (1 panel delivery)	1	1

Significant daily averages for Village bus operation are:

	April	May
Total passengers handled, including transfers	2,270	2,189
Total bus trips	98	87
Total bus miles handled	564	504
Revenue	$111.10	$107.30

MECHANICAL AND LABOR

Work Order Summary:

	Work on Hand Apr. 25		Work Completed in May		Work on Hand May 25	
Areas	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days	No. of Orders	Estimated Man Days
Labor:						
100,200,300	110	639	233	1320	132	747
700 & 1100	131	1638	296	2569	135	1744
Repairs:						
100,200,300	28	184	32	323	5	138
Riverland	55	551	26	278	52	541
700 & 1100	379	2372	334	2095	478	2007
Totals	703	5384	921	6585	802	5177

Bulk fuel plant statistics (in gallons):

	Gasoline	Diesel Fuel	Kerosene
Stock at start of month	20800	3443	0
Received during month	122966	22800	2445
Dispensed during month:			
du Pont	76826	15592	2080
Government	28605	1688	5
Totals	105431	17280	2085
Stock at end of month	38335	8963	360

Repair and Service statistics for du Pont-operated equipment are:

	April	May								
	Totals	100 B	100 D	100 F	200 W	200 E	300	700-1100	Portable Units	Totals
Inspections (Preventive Maintenance)	1364	46	67	65	81	75	-	641	254	1209
Grease Jobs	1364	46	67	65	81	75	-	641	254	1209
Shop and Repair Orders	2452	-	-	-	-	-	-	2065	-	2156*
Gasoline Dispensed (Gallons)	86968	3769	3978	4563	6101	5807	687	42378	7581	77959**
Kerosene Dispensed (Gallons)	980	-	5	-	-	-	-	-	487	492
Diesel Fuel Dispensed (Gallons)	17479	-	-	-	-	-	-	-	10352	16275***
Antifreeze Dispensed (Quarts)	103	-	-	-	-	-	-	-	-	0

* Includes 91 shop and repair orders at Riverland Yard.
** Includes 3105 gallons disbursed from Morrison-Knudsen underground tanks.
*** Includes 5923 gallons diesel fuel from Riverland Yard.

2

[redacted]

Transportation Department

Labor work volume statistics are as follows:

	April Totals	May 100 B	100 D	100 F	200 W	200 E	300	700-1100	Totals
Cars Coal Unloaded	376	-	11	15	2	-	1	7	36
Cars Other Materials Unloaded	30	-	4	4	7	5	7	-	27
Frt. Shipments Handled	23	8	6	32	-	-	-	16	62
Personal Effects Moved, Including Baggage	8	-	-	-	-	-	-	-	0

RICHLAND TRAFFIC OFFICE

The work volume statistics are as follows:

Office Business	April	May
Household Goods Movements Arranged	24	18
Household Goods Movements Traced	3	7
Automobile Shipments Arranged	8	3
Automobile Shipments Traced	1	0
Rail Bills Approved	92	113
Truck Bills Approved	215	172
Express Bills Approved	79	86
Household Goods Claims Filed	19	7
Household Goods Claims Collected - Number	28	6
Household Goods Claims Collected - Amount	$739.97	$111.17
Work Orders Issued - RHG Repairs	74	43
Insurance Riders Issued	34	26
Insurance Bills Approved	30	38
Freight Claims Filed	5	3
Freight Claims Collected - Number	6	8
Freight Claims Collected - Amount	$142.45	$243.58
Requests for Billing	4	2
Rail Reservations Made	72	53
Air Reservations Made	61	73
Ticket Refund Claims Filed - Number	10	4
Ticket Refund Claims Filed - No. of Tickets	10	4
Ticket Refund Claims Collected - Number	20	17
Ticket Refund Claims Collected - Amount	$397.84	$826.84
Freight Shipments Traced	19	53
Express Shipments Traced	0	0
Carload Shipments Received	420	123
Carload Shipments Outbound	7	3
Hotel Reservations Made	31	27
Expense Accounts Checked	55	34
Freight Shipments Converted	752	82
Express Shipments Converted	21	0
Government Bills of Lading Accomplished	146	71
Freight Bill Pre-Audit Savings	$487.03	$171.25
Rates, Routings, Schedules Checked	819	319
Routing Instructions Issued	12	5

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Household Effects	April	May
Lots Shipped Out	24	19
Lots Pending	39	42
Automobiles Shipped Out	8	3
Household Lots Via Express	15	36
Household Lots Via L.C.L. Freight	2	4

Commodities Received - Carloads	April	May
Aluminum Ingot and Bars	1	0
Ammonium Silico Fluoride	1	0
Ammonium Sulphate	1	0
Argon Gas	2	1
Asphalt	0	2
Bismuth Subnitrate	0	1
Buses	7	0
Caustic Potash	1	0
Caustic Soda	13	10
Chemicals	3	5
Chlorine	1	1
Coal	331	43
Cross Ties	1	4
Ferric Sulphate	6	7
Ferrous Ammonium Sulphate	0	1
Fire Brick	1	0
Helium	1	0
Hydrofluoric Acid	0	1
Hydrogen Peroxide	1	0
Lime	2	2
Lubricating Oil	1	0
Lumber	0	3
Mattresses	2	0
Merchandise	11	5
Nitric Acid	12	13
Oxalic Acid	0	1
Phosphoric Acid	2	4
Roofing	0	1
Salt	1	0
Sand	1	0
Silicate of Soda	9	10
Soda Ash	2	3
Sodium Bichromate	1-	0
Sulphuric Acid	2	1
Tie Plates	3	3
Tires	0	1
Totals	420	125

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MEDICAL DEPARTMENT

MAY 1946

HEALTH INSTRUMENT SECTION

100 Areas

General

An alpha-particle emitting contamination has been found on returned crates which have been used to ship irradiated bismuth. An empty tube which was inadvertently left unplugged when the Pile was started produced a beam of rather high intensity. An irradiated uranium slug was cut in a storage basin causing the spread of large amounts of contamination.

Work Permit Summary

Special Work Permits were processed as follows:

	April	May
100-B	372	193
100-D	510	547
100-F	434	546
Total	1316	1286

Retention Basin Effluent

The activity of water leaving the Retention Basins was as follows:

	100-D	100-F
Power level (MW)	250	200
Average beta dosage-rate (mrep/hr)	0.8	0.6
Average gamma dosage-rate (mr/hr)	1.5	1.7
Average total dosage-rate (mrep/hr)	2.3	2.3
Average integrated dose in 24 hrs. (mrep)	55	55
Maximum integrated dose in 24 hrs. (mrep)	60	62

Water samples from the 100-B Retention Basin had a maximum activity of 1.7×10^{-3} uc/liter, after a uranium slug was cut in the storage basin. The average activity was 4×10^{-4} uc/liter. No shoreline spring samples were obtained because the springs have been covered by the rising Columbia River.

Pile Buildings

The ventilation has been improved in the 100-D Pile Building so that hazards from radioactive gases have been considerably reduced. Gases purged from the verticle thimbles and trapped in the third safety headers continue to produce high radiation levels on top of the Piles.

The wooden crates used to ship irradiated bismuth have been returned with large amounts of contamination which gives off alpha particles. The con-

tamination has been identified as polonium by chemical separation. Air samples taken from inside the box indicated about 1.5 x 10^{-15} ug Pu/cc which is slightly more than the tolerance figure for 8 hours exposure perday. The casks inside the boxes were contaminated to a lesser degree and can be used again. The wooden crates are being buried.

During the cutting of "papoose" slugs in the 100-B Storage Basin, some irradiated uranium was accidently cut spreading contamination on the storage basin floor and other objects in the basin. Later, some personnel became rather heavily contaminated after handling some of the underwater equipment. Readings up to 1000mrep/hr were obtained on gloves which they wore. Their clothing included undergarments which were also contaminated. Slight skin contamination was also observed which was easily cleaned by washing. The contaminated area was isolated until the condition was remedied.

The 100-F Pile had started up following a shutdown when it was discovered that an air-filled tube had been left partly open without the proper number of dummy slugs. Gamma radiation giving 6000 mr/hr was observed, and measurements of slow neutrons indicated 1500 mrep/hr. The Pile was shut down and the tube was plugged before continuing operation.

200 Areas - T and B Plants

General

There were no unusual happenings in the 200 Areas during the month. The control of contamination is an everpresent problem and has been handled satisfactorily most of the time.

Survey Statistics

	April			May		
	T	B	Total	T	B	Total
Surveys for Special Work Permits	553	361	914	426	330	756
Other routine & Special surveys	455	575	1030	390	506	896
Smear samples for alpha counts	874	807	1681	850	833	1683
Smear samples for beta counts	992	807	1799	763	852	1615
Air monitoring samples	461	456	917	442	384	826
Thyroid checks	399	239	638	291	255	546

Canyon Buildings

The crane cab in the B Plant Canyon Building has had an air filter installed to prevent the entrance of airborne contamination. Checks have been obtained on the filter when water solutions were jetted into an open cell with a consequent liberation of some activity in the air. The first check showed that air filter was not working properly. After it was repaired, further checks showed that it successfully kept the air activity at low levels.

There were no unusual hazards observed, but the usual number of contaminated locations and pieces of equipment were found. The control of this contamination has been satisfactory.

Control Laboratories

There were two accidental spills of rather active solutions which occurred in the laboratories. None of the personnel involved in the accidents was contaminated. However, there was considerable contamination spread when the handle of a sample carrier was not changed when the sample was brought from the Canyon to the laboratory. A number of people had high hand counts as a result of this incident.

Concentration Buildings

Contamination control was well maintained in both buildings. The assault masks which are worn for work in the cells have been found to be slightly contaminated. One assault mask was worn without the filter cannister during a job where air contamination was possible.

200 Area Isolation Building

Air Monitoring

Eighty long-period air samples were taken and the maximum observed was 5×10^{-11} µg Pu/cc. There were 14 samples taken from the filtered hood air system and the maximum concentration found was 2×10^{-11}. There were 164 spot checks made and 149 of these had less than 10^{-11} µg Pu/cc. The maximum level was 4×10^{-10} µg Pu/cc, and there were 5 other samples with more than 10^{-10} µg Pu/cc. All of these high values were found in Cell #4.

Surface Contamination

About 20,000 items were checked for contamination and 431 non-regulated items were found to be contaminated; and 32 of these non-regulated items had more than 0.5 µg Pu. There were 329 contaminated non-regulated items found in the laboratories. There were 6 small spots of floor contamination, with a total of only 0.2 µg Pu.

Gamma Radiation

The maximum reading observed was 17 mr/hr on the side of a PR container.

300 Area

Metal Fabrication Plant

Twenty-seven air samples were obtained and 8 of these had more than 1.5×10^{-4} µg U/cc. The conditions in the Chip Recovery operation have improved so that no over-tolerance exposures were obtained. The improvement is due to improved techniques and teaching the men to stand as far from the piles of metal as possible during the work. The use of heavy gloves in the Finish Machining operation has reduced exposure there about 50%.

Separations Laboratories

The amount of work with active materials has been reduced so much that no new contamination has been produced. Contamination is still being found in the laboratories and on equipment being returned to storage. 29 air samples were obtained and no sample had more than 2×10^{-11} ug Pu/cc.

Plant General

Well and River Water Monitoring

One hundred thirty eight water samples were taken during the month. The maximum level for river water was 4.3×10^{-4} uc/liter for a sample taken near the Hanford Ferry. This value has been corrected by a factor of 4 to allow the radioactive decay which took place between the sampling time and the counting time. Previously quoted results have not included this factor. The maximum level for a well water sample from Ranch #13 was 1.7×10^{-4} ug/liter. The B-y well had a maximum of 1.1×10^{-4} uc/liter and the 3000 Area well had a maximum of 9×10^{-5} uc/liter. None of the river or well samples had a positive alpha count.

Atmospheric Monitoring

The integrons and C Chambers indicated average dosage-rates as follows:

Location	Integrons (mr/24 hrs)		C Chambers (mrep/24 hrs)	
	April	May	April	May
100-B	0.7	0.2	0.3	0.3
100-D	0.2	0.1	0.3	0.4
100-F	0.4	0.3	0.3	0.4
200-W	1.1 *	0.4 *	0.4	0.5
200-E	2.1 *	1.3 *	0.7	0.8
Riverland	0.6 *	1.0 *	---	---
Hanford	1.2 *	0.1 *	---	---
300 Area	0.6	0.7	0.8	0.6
Richland	1.8 *	0.3 *	---	---
Benton City	0.2 *	0.7 *	---	---
Kennewick	0.4 *	0.1 *	---	---
Pasco	0.3	0.3	---	---

* mrep/24 hrs. (Thin window chambers)

The maximum concentration recorded by a constant iodine monitor was 2.4×10^{-6} uc/liter in the SE corner of the 200-East Area. Positive readings were also obtained in the 300 Area and Benton City, but these were much lower, about 3×10^{-7} uc/liter.

Vegetation Contamination

The contamination levels have remained about the same near the 200 Areas. The maximum levels were 0.5 mrep/hr, 1000 feet SE of the T Plant stack; and 0.2 mrep/hr, 1000 feet SE of the B Plant stack. The following average values of vegetation contamination were observed:

[redacted]

I^{131} - $\mu c/kg$

Location	April	May
North of 200 Areas	0.23	0.19
Hanford	0.73	0.17
Near 200 Areas	3.86	1.21
South of 200 Areas	0.32	0.13
Richland	0.14	0.06
Benton City	0.20	0.05
Kennewick	0.24	0.05
Ritzville	0.17	0.04
The Dalles	----	0.15

Other slightly positive results were obtained north and northeast of the Plant. The average value being about 0.07 uc/kg. The positive reading from the Dalles is the only one in that vicinity which was that high.

Laundry Decontamination and Hand Counting

66,715 items were monitored in the Plant Laundry. This included 17,003 coveralls, 17,704 gloves and 14,530 overshoes. 28,246 alpha hand counts and 28,846 beta hand counts were recorded. About 0.8% of the alpha counts and 0.7% of the beta counts were above the warning limits.

Calibration Service

Radium calibrations were:

Type	Instrument	Number of Calibrations April	Number of Calibrations May
Stationary:	Integron	404	409
	BM & GE Chamber	218	225
	Total	622 **	634 ***
Portable:	Beckman Survey Meter	193	178
	Lauritsen Electroscope	84	70
	Victoreen Survey Meter	140	115
	GM survey meter	44	43
	Miscellaneous	30	48
	Total	491	454
Personnel Meters:	Pencils	7490	6960
	Badges	960	960
	Total	8550	7920
Total Radium Calibrations		9663	9008
X-ray and Intermediate energy gamma and beta calibrations:			
Portable Instruments:			
	Pencils	6803	6263
	Miscellaneous Film	989	980
	Total	7792	7243
Grand Total		17,455	16,251

** 434 furnished by Area H. I.
*** 394 furnished by Area H. I.

Miscellaneous

A number of fish have been caught in the Columbia River and these were analyzed for radioactivity. The maximum concentration found was 9×10^{-2} uc/kg in the liver of a "Shiner". Some long-lived activity has been found in the fish and will be followed to determine its half-life. Salmon fingerlings ~~were~~ exposed to warm effluent water were studied after various times of exposure. All fish tested had about 6 to 7 ug/kg except those exposed for two weeks, which had only 4 uc/kg.

The urine-analysis program is now operating to check on the amount of plutonium which can be found in the urine of those people on the Plant who work in the operating areas.

Personnel Meters

Pencils

	100-B*	100-D	100-F	(H&W) 200	200-W	300	Total
Total Pencils read:	1,872	10,095	10,567	25,856	29,775	10,917	89,082
No.of single readings: (100 to 200 mr)	5	26	50	99	147	56	383
No.of paired readings: (100 to 200 mr)	2	1	1	3	7	2	16
No.of single readings: (over 200 mr)	7	34	63	146	202	90	542
No.of paired readings: (over 200 mr)	0	1	0	1	3	1	6

* Pencil Meter service at 100-B was concluded on May 5, 1946.

Badges

Badge results by Areas were:

				761(W)			
Total badges processed:	2,340	3,198	3,354	3,402(E)	4,151	3,451	20,657
No.of readings: (100 to 300 mrep)	0	3	4	7	0	120	134
No.of readings: (300 to 600 mrep)	0	0	0	0	0	2	2
No.of readings: (over 600 mrep)	0	0	0	0	0	0	0
No.of lost readings:	3	0	0	2	6	1	12

None of the high pencil readings was confirmed by a badge reading. The two badge readings over 301 mrep in the 300 Area were less than 500 mrep so that the average exposure per day was less than 100 mrep.

[redacted]

PLANT MEDICAL SECTION

Physical Examinations	April	May	Year To Date
Pre-employment	24	19	283
Annual	359	298	1343
Sub-contractor(Food Handlers,etc.)	34	22	182
Rechecks	160	137	702
Interval Rechecks (Area)	1043	845	4995
Terminations and Transfers	164	151	562
Army and Government	52	39	179
Assist to Clinic, A & H Insurance, etc	8	2	28
Total	1844	1513	8274

Laboratory Examinations

Clinic Laboratory

Pre-employment,terminations,transfers	1100	1103	5590
Annual	2341	2000	8799
Rechecks (Area)	5593	4192	25721
First Aid	43	40	215
Plant Visitors	64	100	349
Clinic	2155	2044	11364
Hospital	1829	1708	9326
Public Health(Including Food Handlers)	263	164	752
Military	171	80	383
Total	13559	11431	62499

X-ray

Pre-employment,terminations,transfers	199	166	844
Annual	396	315	1456
First Aid	72	59	336
Clinic	246	249	1256
Hospital	78	92	479
Public Health (Including Food Handlers)	38	30	236
Military	28	11	76
Total	1057	922	4683

Electrocardiographs

Industrial	184	125	653
Clinic	15	13	56
Hospital	18	12	63
Military	5	0	7
Total	222	150	779

Allergy

Skin tests	2	9	38

First Aid Treatments	April	May	Year To Date
Occupational Treatments	353	294	1507
Occupational Retreatments	817	743	4408
Non-occupational(Welfare)Treatments	3209	2845	16609
Total	4379	3882	22524

Absentee Investigation Report

Total number calls requested	81	38	446
Total number calls made	81	38	446
Number absent due to illness in family	4	5	31
Number not at home when call was made	6	5	33

General

The health topic for the month of May was "Dental Hygiene". Material on this subject was given plant-wide distribution and a more detailed write-up was given to health meeting leaders.

98% of plant employees have now been vaccinated for smallpox.

There has been, thus far, no evidence of occupational disease due to special or other chemical hazards of operation.

VILLAGE MEDICAL SERVICE

Clinic

Treatment Summary	Men	Women	Children	April	May	Year To Date
First Visits	200	158	142	598	500	3063
Retreatments	760	1520	688	3060	2968	14059
			Total	3658	3468	17122
Seen in Well-Baby Clinic				268	201	1061

Clinic Visits

Medical	579	609	2910
Pediatrics	517	402	2682
Surgical	722	717	3128
Gynecological	279	249	1401
Obstetric (New)	33	23	210
Obstetric (Recheck)	478	418	2054
Venereal Disease	85	58	389
Ear, Nose and Throat	89	116	1129
Eye	236	221	1206
Visits handled by nurses(hypodermics, dressings, etc)	368	236	1448
Night clinic visits	146	419	565
Total	3532	3468	17122

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Home Visits	April	May	Year To Date
Doctors	218	168	880
Nurses	77	58	337
Total	295	226	1217

Dental Health Center

Patients treated	1864	1669	8163

Kadlec Hospital Section

General

There were fewer admissions and discharges this month than last. The average daily census, however, was slightly higher; this is probably due to the fact that there were more one-day cases in April than in May.

Census	April	May	Year To Date
Admissions	322	286	1584
Discharges:			
Surgical	83	77	375
Medical	48	38	217
Obstetric & Gynecologic	60	61	310
Eye, Ear, Nose & Throat	45	36	254
Pediatrics:			
Children	38	43	241
Newborn	30	38	164
Total	304	293	1561
Patient Days	1918	1917	9815
Average Stay	6.3	6.5	6.2
Average Daily Census	61.8	63.9	65.0
Discharged against advice	2	1	4
One-Day Cases	61	39	213

Operations

Transfusions	14	7	97
Eye, Ear, Nose and Throat	27	22	177
Dental	2	2	9
Casts	9	11	58
Minors	51	49	403
Majors	31	25	130
Deaths	2	2	12
Deliveries	39	35	142
Stillborns	0	1	3

Physiotherapy Treatments	April	May	Year To Date
Clinic	145	140	424
Hospital	37	17	144
Army	30	19	90
Industrial:			
Plant	79	46	389
Personal	24	10	235
Total	315	232	1282

Pharmacy

Number of prescriptions filled	1577	1699	7774

Patient Meals

Regulars	2169	2238	10467
Lights	292	242	1655
Softs	1369	1331	5876
Surgical Liquids	120	130	647
Tonsils and Adenoids	104	86	578
Specials	381	175	2399
Liquids	282	243	1637
Total	4717	4445	23259

Cafeteria Meals

Noon	1322	1236	7620
Nights	175	219	1292
Total	1497	1455	8912

Nursing Personnel

First Aid Nurses	24	22
Clinic Nurses	11	12
Public Health Nurses	7	7
Hospital General Nurses	57	54
Aides and Orderlies	41	39
Total	140	134

Public Health Section

General

Mr. A. C. Robinson of the State Department of Health completed the survey of the food-handling establishments on May 14, 1946. While the official report has not been received, Mr. Robinson indicated that considerable improvement had been made in the sanitary aspect of the establishments in the past year. The summary of the infractions presented in a meeting of Housing and Medical Department representatives were mainly poor operative procedures on the part of the concessionaire. Mr. Robinson's official report will be used as a lever to gain compliance with the standards set forth by the State Department of Health. It also may be said that the majority of the items discussed by the

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State Sanitarian have been called to the attention of the various operators on previous occasions.

Miscellaneous visits relative to dog bites, vermin and rodent investigations continue to be numerous. The dogs involved in bite cases are required to be confined for a period of 14 days for observation. To this date, no dog has been found to be rabid. The majority of the vermin and rodent infestation inquiries have come from residents in which case advice and information relative to control measures have been given.

The operation of the sewage plant has been satisfactory from a bacteriological standpoint.

Twenty-one vendor permits were issued during the past month, all of which were for permission to peddle eggs.

Increased milk production during the past month has made it possible to maintain the quality of the supply by eliminating two producers who have been lax in maintaining proper sanitation. Samples of milk obtained from the sixty-eight producers have indicated that a large percentage of them were negligent during the past week in properly cooling the milk. This matter was discussed with the milk plant superintendent and this department was assured that the situation would be corrected. The pasteurized product has continued to be very satisfactory.

Activities of the Mosquito Control crew have, to this date, included the area between the Columbia and Yakima Rivers from a point one mile north of the village to the junction of the rivers south and east of the village. The unprecedented rise of the river waters has necessitated concentration of efforts on areas flooded by both rivers. Control measures have consisted almost wholly of spraying with oil emulsion by the ground apparatus and five percent DDT in diesel oil by the airplane equipment. The well area was flooded for the first time on May 17, 1946. This area showed present larvae four days later and as a result will be drained and residual water will be treated with an oil emulsion to destroy the remaining larvae.

The smallpox vaccination campaign has been continued during the regular clinic hours throughout the month of May. During the month 654 vaccinations were given, bringing the total since the campaign started to 11,804. The immunization program in the schools was completed during the month of May when a total of 466 children were immunized against diphtheria.

Communicable Diseases Reported	April	May	Year To Date
Diphtheria	0	0	0
Chickenpox	8	2	64
German Measles	9	0	15
Measles	38	20	89
Mumps	13	19	35
Scarlet Fever	6	3	11
Pinkeye	1	0	3
Influenza	4	1	116

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	April	May	Year To Date
Impetigo	2	2	17
Ringworm	6	1	26
Scabies	7	0	21
Vincent's Infection	2	0	49
Syphilis	3	0	4
Gonorrhea	11	0	19
Tuberculosis	1	0	1
Total	111	48	470
Immunizations			
Smallpox	11321	39	11447
Diphtheria	36	51	150
Whooping Cough	37	46	151
Schick Test	10	4	41
Tetanus	39	49	173
Total	11443	189	11962
Administration			
Newspaper articles	5	6	17
Committee meetings	1	2	6
Attendance	15	37	95
Staff meetings	0	0	9
Lectures and talks	5	2	27
Attendance	120	126	625
Sanitation Inspections	163	149	717
Bacteriology Laboratory			
G. C. Smear	47	21	236
G. C. Culture	39	16	215
Fungus Culture	15	27	70
Vincent's Examinations	25	6	134
Trichomona's Examinations	26	22	153
Sputum for T. B. organisms	6	18	62
Bacterial Cultures	40	30	170
Examinations for Parasites	86	29	159
Throat Smear and Cultures	30	20	100
Blood Cultures	6	2	12
Stool Cultures	5	0	20
Eye Smears	5	0	16
Examinations for spermatozoa	2	2	8
Quantitative determination of blood alcohol	2	0	4
Type for pneumococcus	0	2	3
Treated water samples	70	77	383
Untreated (raw water) samples	90	90	436
Milk Samples(Milk, cream, ice cream)	76	75	382
Sewage Samples	12	8	46
Examination for Eosinophiles	3	0	6
Dark field examinations	3	1	4
Total	588	449	2556

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ACCOUNTING DEPARTMENT

MAY 1946

GENERAL

The Advance Account remains at $6,000,000.00.

The average hourly rate for the Monthly and Weekly Salary Rolls was $2.40 and $1.68, respectively.

ACCOUNTING

Through May 31st, billings totaling $366,697,815.69, representing 10,719 public vouchers (Form 1034) have been submitted to the Government, of which the General Accounting Office has approved 10,510, with a total value of $365,278,722.26.

CLERICAL

A change in the payday payoff period at the bus terminal was made May 3, 1946. The paymaster now reports to work at 6:00 A.M. instead of 5:36 A.M., and the deputy paymasters now report at 6:12 A.M. instead of 5:48 A.M. This change was made to conform with revised bus schedules recently instituted by the Transportation Department.

An increase of $.03 per $1,000.00 of insurance was made on Group Life, making the new rate $1.07 per thousand effective with the May premium.

Effective May 13, 1946 the Time Office assumed the responsibility for processing Leave of Absence applications previously handled by the Service Department.

Fifteen days stock of caustic soda and sixteen days stock of nitric acid were on hand or in transit when the freight embargo went into effect. No difficulty was encountered as the embargo was lifted three days after it went into effect.

The practice of obtaining prior approval from the Area Engineer to change shipping instructions when the change involves an expenditure in excess of $50.00 was discontinued. Alterations to change shipping instructions are supported by a properly approved field request to expedite material.

A special study to standardize and enlarge the Purchasing Unit source of supply files was completed during the month.

Coal vendors began shipment of coal as soon as the two-week truce in the coal strike was announced.

New catalogs for captions 903-10 (laboratory supplies), 903-19 (oil and grease), and 903-20 (paint) were prepared and issued by Stores during the month.

STATISTICS

Accounting (calendar month basis)

	April		May	
	No.	Amount	No.	Amount
P.O.'s Received	1,083	—	948	—
MR's Received	2,795	—	1,847	—
APV's Entered	2,388	$ 747,154.20	2,288	$ 565,131.06
Checks Issued	1,784	980,670.14	1,679	638,784.30
Cancelled	92	—	65	—
PR Transfers	4	1,001,577.00	5	1,219,009.93
EB's Entered	317	5,125.87	414	4,902.52
1034's Issued	320	2,570,450.73	341	1,299,107.86
Reimbursed	289	1,282,529.48	288	2,328,163.70
Non-Payment Credits	0	—	0	—
War Bonds Issued (Maturity Value)	3,668	135,250.00	4,633	182,525.00

Purchasing

	April	May
PHX Purchase Orders Placed	954	1,048
Orders Placed by Government	49	52
Requisitions Received	1,486	1,542
Requisitions Placed	1,583	1,642
Requisitions on Hand (Unplaced at month-end)	463	363

Stores

Returnable Containers Received	3,639	547
Returnable Containers Returned	748	633
Balance on Hand (at month-end)	4,124	4,038
Shipments Made (OROM)	37	47
Receiving Reports Issued	2,908	1,739
Material Exception Reports Issued	94	67
Items Set-up in Stores Stock (at month-end)	41,414	40,974
Excess Material Shipped to Date	$ 2,873,581.55	$ 3,276,756.30
Value of Excess Material Inventory	1,499,044.21	1,252,079.69
Stores Disbursements	77,578.49	64,661.42
Spare Parts Disbursements	5,793.10	16,148.01
Value of Stores Stock (at calendar month-end)	1,031,823.29	1,015,347.86
Value of Spare Parts (at calendar month-end)	1,111,473.07	1,098,200.20
Value of Special Process Materials (at calendar month-end)	207,600.66	214,050.87

Essential Materials

Value of Materials Consumed during Month	$ 387,818.71	$ 371,283.53
Value of Materials in Stock (at calendar month-end)	1,021,768.09	870,804.06

Miscellaneous Clerical

Duplicating & Printing Orders Received	5,054	4,607
Duplicating & Printing Orders Completed	5,048	4,602
Mail Handled (Incoming)	23,230	17,254

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PROJECT AND RELATED PERSONNEL

	4/25/46	5/25/46
Government Employees		
Civilian Personnel - Corps of Engineers	241	245
" " - GAO	5	5
Commissioned Officers (exclusive of MP's and MI)	17	17
MP Company (including C.O.)	223	213
MI Detachment (including C.O.)	25	26
Special Detachments	5	5
Military Personnel (other than above)	14	10
Total	530	521
Prison Industries (total)	239	278
Mohawk Trucking and Lumber Company	332	298
Richland Village Personnel		
Facilities	593	604
Schools and Churches	177	177
Total	770	781
Morrison-Knudsen Personnel	94	88
Du Pont Personnel	4518	4390
GRAND TOTALS	6483	6356

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